

# **Building the climate resilience of children and communities through the education sector (BRACE)**

## **Annex 2: Feasibility Study**

Accredited Entity: Save the Children Australia

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# 1. Introduction

## 1.1 Purpose and structure of this report

This feasibility study provides background information to the Green Climate Fund funding proposal for the project “BRACE” prepared by Save the Children Australia (SCA) in partnership with the Global Partnership for Education (GPE) and United Nations Educational, Scientific and Cultural Organization (UNESCO). The purpose of this report is to provide the justification and further detail of the project design process and supporting information used to prepare the funding proposal. It also includes an assessment of the project design.

The feasibility study is structured around the components of the BRACE projects:

**Component 1** will directly address and respond to the impacts of climate change on the education sector and address future climate risks in **Cambodia, South Sudan, and Tonga**. These countries present three very different contexts (including fragile contexts) with diverse geographies (including SIDS) and climate hazards (including droughts, drought related wild-fires, heat stress, floods, flash floods, strong winds and sea level rise). By implementing an approach in three very different contexts, BRACE will be able to demonstrate an adaptable model that can be replicated in other countries.

**Component 2** of BRACE will support Ministries of Education in the three countries – Cambodia, South Sudan and Tonga - supporting them to further **access climate finance** and to lead climate-resilient sustainable development in the education sector. Component 2 has both co-financing and parallel project finance by the Global Partnership for Education (GPE) through the Climate Smart Education Systems Initiative (CSESI). CSESI is funded by GPE and implemented by United Nations Educational, Scientific and Cultural Organization (UNESCO), UNESCO International Institute for Educational Planning (IIEP), and Save the Children to provide technical assistance to lower-income countries to reinforce Ministry of Education capacity for mainstreaming climate change into the education sector. The parallel project finance will provide the scaffolding for a consultative process of country-driven needs identification and prioritization, this initiative will also serve as the impetus for the replication of lessons learned for the BRACE countries enabling the scaling up experience to an additional 32 countries over the next 5 years. The CSESI methodology, delivered as co-financing in the 3 BRACE countries, will be documented and shared as a model to inform inclusive climate-focused education dialogue and programme design processes in other countries, while also supporting learning between countries on their experiences.

**Component 3** will support the education community to better coordinate, collaborate, and share lessons learned and experiences with a focus on climate finance for the benefit of the BRACE countries and future scaling up through the GPE parallel project finance and broader education systems strengthening work. Component 3 is also co-financed by CSESI and will strengthen collaboration of climate change and education communities and ensure that education features more prominently in climate finance.

The three components address the adaptation gaps at national and subnational levels including but not limited to: education-related climate vulnerability and guidelines/standards, policy and coordination, awareness raising and capacity building, climate resilient inputs related to infrastructure and planning in school communities, inclusive participation, social and governance structures in school settings, generation of knowledge and knowledge sharing, availability of transferrable pilots to like-for-like settings, global collaboration of the education sector focused on coordinated climate resilient priorities, targets and actions, and access to climate finance for the education sector.

## 1.2 Global climate drivers and impacts on education

One billion children, nearly half the world's children, live in countries at extreme vulnerability to the impacts of climate change with serious consequences for their education.<sup>1</sup> Schools are increasingly exposed to risks driven by climate change: principally increasing temperatures, changing rainfall patterns and increasing frequency and/or intensity of extreme events. The resulting stronger and longer droughts and heatwaves and increased frequency and intensity of extreme rainfall events and severe storms all impact school-aged children's access to an uninterrupted, safe, quality, and inclusive education.

Climate change disrupts the education of children in all their diversity in many ways – directly and indirectly. Increasing numbers of school days are being missed and more children are dropping out before completing a quality education. Exposure to climate hazards is positively associated with reduced years of schooling completed in tropical counties. School buildings, water, sanitation and hygiene (WASH) facilities, and school materials are damaged or destroyed during extreme weather events, or slowly eroded by harsher climate conditions affecting children's attendance and their physical safety and psychosocial well-being. Further, children may be displaced by climate-related disasters affecting their attendance at school. There were 43.1 million internal displacements of children linked to weather-related disasters over a six-year period – the equivalent to approximately 20,000 child displacements a day.<sup>2</sup> When children and their families are displaced by climate threats, the risk of dropping out of school dramatically increases. Even when children are in school, climate and environmental changes – such as rising temperatures, droughts and floods – affect their ability to learn. Students are showing lower learning outcomes during hot school years compared to cooler years. These negative impacts on learning can exacerbate intergenerational cycles of poverty and inequality and drive conflict for increasingly scarce natural resources.

Marginalized groups are disproportionately affected. Girls face unique risks due to climate change such as increased risk of child, early and forced marriage and unions as families struggle to cope with the economic impact of climate shocks, which may lead them to drop out of school permanently.<sup>3</sup> The number of girls at extreme risk of the double blow of climate change and child marriage is set to increase by 33% to nearly 40 million by 2050, negatively affecting their education.<sup>4</sup> On current trends by 2025, the climate emergency is projected to also contribute to preventing 12.5 million girls from completing their education every year.<sup>5</sup> Children with disabilities are often among those most adversely affected by climate shocks, sustaining disproportionately higher rates of morbidity and mortality, and at the same time being among those with the least access to emergency support.<sup>6</sup> Only 8% of participants from a United Nations Office for Disaster Risk Reduction (UNDRR) survey reported that local disaster risk reduction (DRR) plans addressed the specific needs of persons with disabilities.

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The changing climate is already threatening children's right to quality, safe and inclusive education and this is compounded for children living through conflict. Armed conflicts, forced displacement, climate change and other crises increased the number of crisis-impacted children in need of urgent quality

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<sup>1</sup> UNICEF 2021. The Climate Crisis Is a Child Rights Crisis: Introducing the Children's Climate Risk Index. Available [here](#).

<sup>2</sup> UNICEF 2023. Children Displaced in a Changing Climate. Available [here](#).

<sup>3</sup> Plan International 2023. Climate Change and Girls' Education: Barriers, Gender Norms and Pathways to Resilience. Available [here](#).

<sup>4</sup> Save the Children 2023. Girls at the centre of the storm: Her planet, her future, her solutions. Available [here](#).

<sup>5</sup> Malala Fund 2021. A greener, fairer future: Why leaders need to invest in climate and girls' education. Available [here](#).

<sup>6</sup> McGill University and International Disability Alliance 2022. Disability Inclusion in National Climate Commitments and Policies. Available [here](#).

<sup>7</sup> UNDRR 2023. 2023 Global Survey on Persons with Disabilities and Disasters. Available [here](#).

education to 224 million.<sup>8</sup> Of these, one-third or 62 million crisis-affected children and adolescents in 27 countries have had their education disrupted by climate shocks since 2020.<sup>9</sup> Lower income households are also more likely to live in areas that are affected by high climate risk and are more likely to have to resort to harmful strategies in times of hardship. Food and clean water shortages in times of drought and flooding also impact children's daily activities such as walking further to collect drinking water and firewood, or extra childcare responsibilities when children are unable to go to school, further reducing their own time to study and increasing their risk of dropping out of school altogether.<sup>10</sup> The burden invariably falls on adolescent girls and young women. Hunger can affect a child's ability to concentrate in the classroom and also increases the likelihood of missing school. Also, certain diseases may affect girls more than boys if they are already suffering from malnutrition or a lack of water, especially during menstruation or if they are pregnant or young mothers.

Time spent away from school due to disasters has been shown to have severe consequences for learning, lasting years after the disruption has ended. For example, a study of the impact of Pakistan's 2005 earthquake found that children who were only out of school for three months were still one and a half years behind their peers four years later, because losses continue to compound after children returned to school.<sup>11</sup> Quality and inclusive education can equip children with the skills, knowledge and behaviours to address the climate crisis, strengthen their resilience, and improve adaptive capacities in the face of climate shocks and stresses at the same time as addressing inequalities.<sup>12</sup> Children should have opportunities to gain literacy, numeracy, and transferable socio-emotional and green skills that can enable them to pursue their education, enter the job market, and make informed decisions. Importantly, climate change is not for children or future generations to solve – education is an enabler to support them in adapting to its impacts and reducing further impacts. It is today's decision-makers who must urgently mitigate climate change.

Despite this, the role of the education sector in climate action has so far been overlooked. This is demonstrated by just 1 of 591 projects across 4 key multilateral climate funds between 2006-2023 prioritizing education as its principal objective.<sup>13</sup> Further, only 24% of Nationally Determined Contributions (NDCs) specifically target or consider the education of children and young people, for example with respect to school curricula, facilities or associated infrastructure.<sup>14</sup> Education is largely referred to as one of several sectors which will be impacted by climate change and is often used in relation to public education, awareness-raising and capacity-building more broadly.<sup>15</sup> A collaborative and coordinated systems-thinking approach is required to address shared challenges. The education sector has a powerful role in terms of assuring the rights of school-age children to safety, survival, development, and participation in the face of all hazards and risks. By integrating climate change programming into the education sector, we can safeguard schools, communities and students of today, as well as addressing future climate change impacts via climate-responsive policy, cross-sector coordination, safe construction, education and learning.

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<sup>8</sup> Education Cannot Wait 2023. Crisis Affected Children and Adolescents in Need of Education Support: New Global Estimates and Thematic Deep Dives. Available [here](#).

<sup>9</sup> Education Cannot Wait 2023. Futures at Risk: Climate-Induced Shocks and Their Toll on Education for Crisis-Affected Children. Available [here](#).

<sup>10</sup> Young Lives 2023. Weathering the Storm: Climate Shocks Threaten Children's Skills and Learning but Social Protection Can Mitigate Impact. Policy Brief. Available [here](#).

<sup>11</sup> Andrabi, T., Daniels, B., Das, J. 2020. Human Capital Accumulation and Disasters: Evidence from the Pakistan Earthquake of 2005. RISE Working Paper Series. 20/039. Available [here](#).

<sup>12</sup> FCDO 2022. Addressing the climate, environment, and biodiversity crises in and through girls' education. FCDO Position paper. Available [here](#).

<sup>13</sup> Children's Environmental Rights Initiative 2023. Falling short: Addressing the climate finance gap for children. Available [here](#).

<sup>14</sup> UNICEF Office of Global Insight and Policy 2020. A Guide for Action: Are climate change policies child-sensitive? Available [here](#).

<sup>15</sup> Kwauk C., Cooke J., Hara E., Pegram J. 2019. Girls' education in climate strategies Opportunities for improved policy and enhanced action in Nationally Determined Contributions. Available [here](#).

## 2. Component 1: Cambodia

### 2.1 Country Context

Cambodia, officially the Kingdom of Cambodia, is a lower middle-income country in Southeast Asia and bordering Thailand to the northwest, Laos to the north, Vietnam to the east and the Gulf of Thailand to the southwest. A major geographical feature in the country is the Mekong River, which flows from Laos in the north to the Mekong Delta of Vietnam in the south, feeding into the Tonle Sap Lake.<sup>16</sup> The Tonle Sap Lake covers up to 10% of the country's surface and is the primary fishing site for Cambodia's fishing community.<sup>17</sup> The country has a total area of 181,035 sq km with a population of approximately 16.9 million people as of 2023, according to the United Nations Population Fund, (UNFPA).<sup>18</sup> 29% of Cambodia's population is aged between 0 and 14 years while 26% of the population is aged between 10 and 24 years.

Cambodia's sub-national administration consists of three tiers: capital city/province, district/municipality/khan and sangkat/commune. The kingdom has a capital city (Phnom Penh), 24 provinces, 159 districts, 26 municipalities and 12 khans, 1406 communes and 227 sengkats.<sup>19</sup> According to the 2013 Census, Cambodia has 12 major languages. However, approximately 96% of the population speaks the Khmer language, which is also the country's official language.<sup>20</sup> Other languages spoken in Cambodia include Vietnamese, Lao, Thai and English.<sup>21</sup>

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<sup>16</sup> The World Bank Climate Risk Profile: Cambodia. [Available here](#)

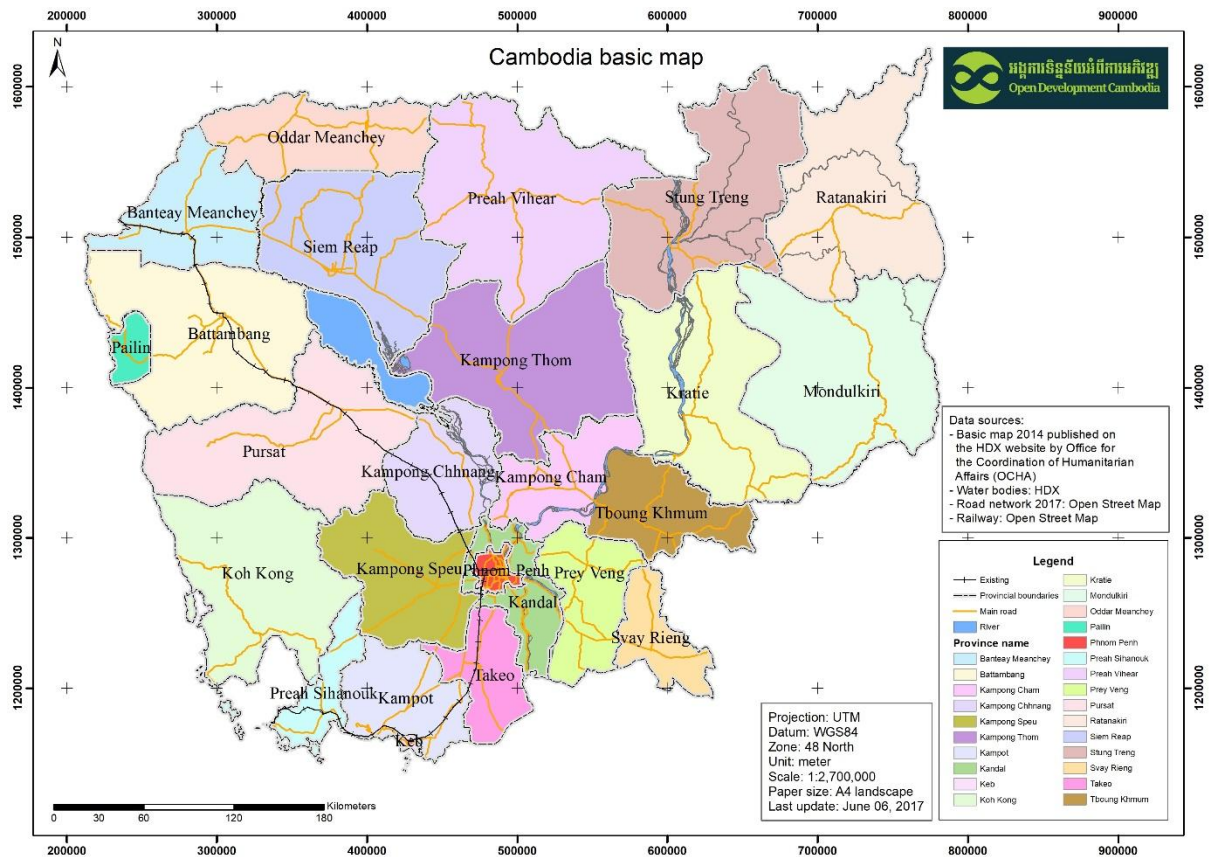
<sup>17</sup> Ibid

<sup>18</sup> World Population Dashboard: Cambodia. [Available here](#)

<sup>19</sup> Cambodia: Administration. [Available here](#)

<sup>20</sup> Population, languages and people of Cambodia. [Available here](#)

<sup>21</sup> Ibid



According to the World Bank, Cambodia has made considerable strides in improving health outcomes, early childhood development, and primary education in rural areas.<sup>29</sup> For instance, in the 2021-2022 academic year, net enrolment rates (NER) for primary, lower secondary, and upper secondary education (both public and private) reached 93%, 46.7%, and 28.6%, respectively.<sup>30</sup> Additionally, health outcomes such as life expectancy at birth and mortality rates have improved considerably between 2000 and 2021.<sup>31</sup>

Cambodia is one of the more disaster-prone countries in Southeast Asia, affected by floods and droughts due to high levels of exposure and vulnerability.<sup>32</sup> The country's vulnerability to climate change is linked to its characteristics as a post-civil war, least developed, predominantly agrarian country, with 76% of the population living in rural areas.<sup>33</sup> It is ranked 144<sup>th</sup> out of 185 countries in the 2023 Notre Dame Global Adaptation Index (ND-GAIN) index.

### 2.1.1 Education sector overview

This section provides an overview of the context of education provision in Cambodia. It highlights the structure of the education system and important education statistics such as enrolment, number of schools and teachers across both primary and secondary levels of education.

In Article 68 of the Cambodian Constitution, promulgated in 1993, the government is mandated to provide free primary and secondary education for all children in public schools.<sup>34</sup> Further in 2007, the Cambodian law was passed, requiring the state to provide nine years of compulsory basic education.<sup>35</sup> This law covers all educational programs, research studies, technical and vocational education and training at all public and private levels of the education system.<sup>36</sup> Cambodia's education system consists of general education and higher education. General education comprises of six years in primary school, three years in lower secondary and three years in upper secondary school.<sup>37</sup> After completing lower secondary education, students have the option of continuing to upper secondary or to secondary-level vocational training programmes offered by the Ministry of Labor and Vocational Training.<sup>38</sup> Students who proceed to upper secondary level must take a national examination upon completion which is used for placement into tertiary education.<sup>39</sup>

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<sup>29</sup> The World Bank in Cambodia. [Available here](#)

<sup>30</sup> Ibid

<sup>31</sup> Ibid

<sup>32</sup> The World Bank Climate Knowledge Portal. Cambodia. [Available here](#)

<sup>33</sup> Ibid

<sup>34</sup> Cambodia's Constitution of 1993 with Amendments through 2008. [Available here](#)

<sup>35</sup> 2007 Cambodia's Education Law. [Available here](#)

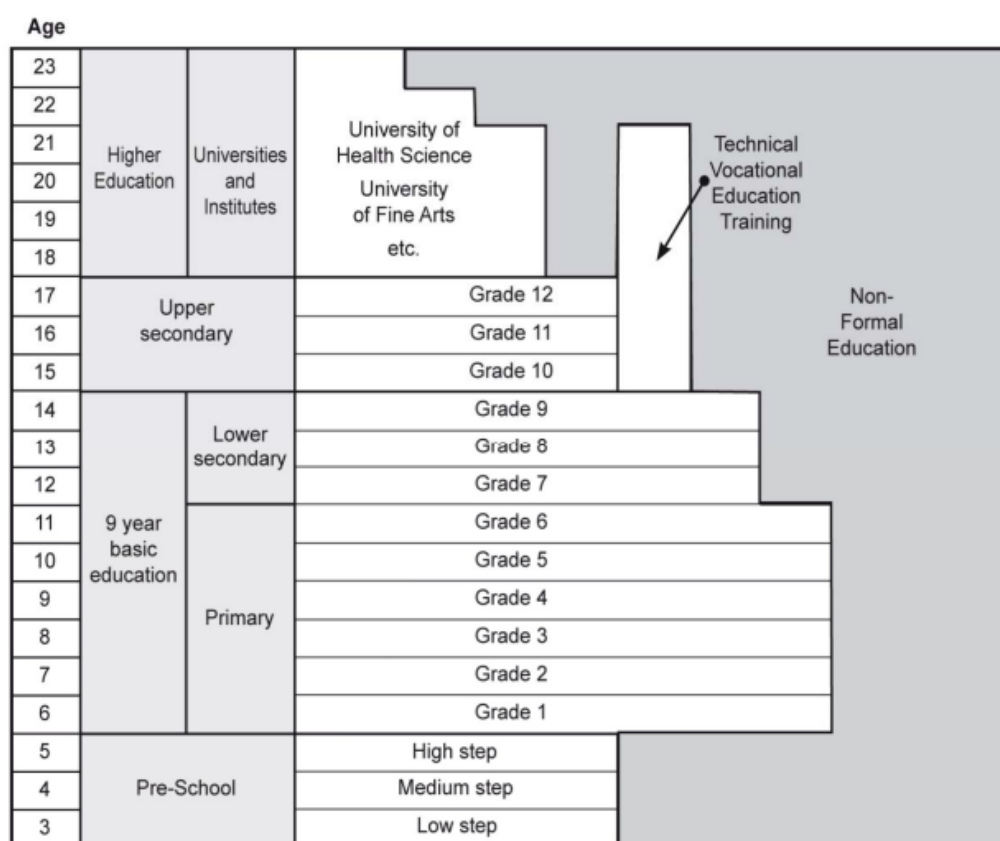
<sup>36</sup> Ibid p.2

<sup>37</sup> Ibid p.7

<sup>38</sup> Education in Cambodia. [Available here](#)

<sup>39</sup> Ibid





**Structure of Education System in Cambodia** *Source: Cambodia Socio-Economic Survey 2021.*  
[Available here](#)

Cambodia's Ministry of Education, Youth and Sports (MoEYS) is in-charge of general education, youth, and sports development while the Ministry of Labor and Vocational Training (MoLVT) is responsible for vocational education and training. The Khmer language is the official language in Cambodia, comprising of 95% of the population.<sup>40</sup>

The adult literacy rate for 2021 was estimated about 85% overall (80% and 90% for women and men respectively).<sup>41</sup> The literacy rates were highest in the age group of 15-24 years, at 96%, and lowest (61%) among the oldest age group of 65+ years.<sup>42</sup> Other important education data are provided in the sub-section below.

#### Key education statistics

| Level                            | Early childhood                          | Primary      | Secondary (Lower and Upper Secondary) | Total ECE - Secondary |
|----------------------------------|--|--------------|---------------------------------------|-----------------------|
| Authority                        | Ministry of Education, Youth, and Sports |              |                                       |                       |
| Numbers of schools <sup>43</sup> | Total: 4,493                             | Total: 7,304 | Total: 2,320                          |                       |

<sup>40</sup> Cambodia Socio-Economic Survey 2021. [Available here](#)

<sup>41</sup> Ibid

<sup>42</sup> Ibid

<sup>43</sup> Cambodia's Public Education Statistics & Indicators 2020 – 2021. [Available here](#)



|                                   |  |   |  |  |
|-----------------------------------|--|---|--|--|
| Numbers of students <sup>44</sup> | Total: 229,092<br><br>Male: 114,118<br><br>Female: 114,974 | Total: 2,010,286<br><br>Male: 1,046,134<br><br>Female: 964,152<br><br>GER: 103.4%<br><br>NER: 86.7% | Total: 984,097<br><br>Male: 456,152<br><br>Female: 527,945<br><br>GER: 57.4% (lower) and 30.1% (upper)<br><br>NER: 39.5% (lower) and 22.0% (upper) | Total: 3,223,475<br><br>Male: 1,616,404<br><br>Female: 1,607,071 |
| Number of teachers <sup>45</sup>  | Total: 5,450<br><br>Male: 273<br><br>Female: 5,177         | Total: 44,874<br><br>Male: 18,685<br><br>Female: 26,189   | Total: 43,631<br><br>Male: 25,200<br><br>Female: 18,431  | Total: 93,956<br><br>Male: 44,159<br><br>Female: 49,797          |

### Structure of The Ministry of Education and other Semi-Autonomous Government Agencies (SAGAs) within in the education sector

The MoEYS is organized into six directorates: Directorate General of Administration and Finance, Directorate General of Education, Directorate General of Higher Education, Directorate General of Sport, Directorate General of Youth, Inspectorate General and Secretariat General of Education for All.

### Teacher training

In 2017, pre-service teacher training was reformed in Cambodia, which included upgrading two of the teacher training centres into teacher education colleges (Battambang and Phnom Penh).<sup>46</sup> The existing teacher training programme is commonly known as “12+2”, consisting of two years pre-service teacher training. The new programme, introduced in 2017, is a four-year programme that is recognised as a Bachelor of Arts, and known as a “12+4”. The new teacher training programme has a stronger emphasis on inclusion, and there is an accompanying guidebook for teachers on programmes, teaching methods and benefits of inclusive education, particularly targeted towards teaching children with disabilities. The Cambodia Secondary Education Blueprint 2030 identifies challenges with current preservice teacher education for secondary level<sup>47</sup>:

- High achieving secondary school graduates do not typically apply to be teachers
- Upper secondary is the preference for university graduates rather than primary or lower secondary (PRESET)
- Standards of the PRESET curriculum are low and lack learning outcomes
- Practicum is poorly coordinated
- Professional knowledge are low, with a tendency towards teacher-centric approaches.

<sup>44</sup> Ibid

<sup>45</sup> Ibid

<sup>46</sup> Pov, Kawai and Nov. (2023). Preparing pre-service teachers to work in Cambodian inclusive classrooms: knowledge, experience and attitudes towards inclusion. *Teaching and Teacher Education* Vol. 137

<sup>47</sup> MoEYS. Cambodia Secondary Education Blueprint 2030. p.23 [Available here.](#)

There have historically been limited opportunities for in-service teacher training in Cambodia. GPE funds one of the largest teacher education programmes to support MoEYS (STEPCam: Strengthening Teacher Education Programs Cambodia), aiming to improve teaching and learning in the early grades.<sup>48</sup> The programme focuses on four key areas: “implementation of systems that support continuous professional development; in-service training and mentoring for early grade teachers in Khmer and Mathematics; renovation of 11 provincial teacher training centers (PTTC); and upgrading the qualifications of PTTC trainers”.

### **Curriculum reform**

The Education Strategic Plan for 2019-2023 outlined the past and future intention for curriculum reform in Cambodia. From 2018, the plan indicated that student-centred and inquiry-based learning were to be adopted in all levels of education.<sup>49</sup> The plan also indicated that curriculum reforms for all levels of education “aim to develop the full potential of all citizens, whether physical or intellectual. They also address moral values and, at the basic education level, focus on being a good person, which is useful for the self, the family, the community, the nation and the world.”<sup>50</sup>

The Cambodia Secondary Education Blueprint 2030 outlines 8 priority areas for secondary education, including to “align [the] curriculum, instruction and assessment in all subjects, especially Science, Technology, Engineering and Mathematics with 21<sup>st</sup> Century quality education” and to “integrate digital education in secondary education”.<sup>51</sup>

### **Educational enrolment and attainment**

At primary level, net enrolment is at 100%, compared to 80% for lower secondary level.<sup>52</sup> Even amongst students enrolled in primary and secondary education, data suggests students are not currently acquiring expected basic knowledge and skills. According to UNESCO Institute for Statistics data, by the end of primary school, only 9.88% of students achieve minimum proficiency in mathematics, with only 7.51% of students achieving minimum proficiency in reading.<sup>53</sup> At secondary level, 18% achieve minimum proficiency for mathematics and 11% for reading, likely due to the weakest students dropping out post-primary education. Covid-19 also had a dramatic impact on learning loss. According to the MoEYS Grade 6 national learning assessments, learning performance in 2021 were 0.30 and 0.75 standard deviations lower than in 2016 for Khmer and mathematics, respectively.<sup>54</sup>

#### **2.1.2 Policy landscape**

This section discusses the international and national policies, frameworks and the strategic roadmap designed to steer the country’s development across different sectors. It also highlights the integration of climate change agenda in these plans.

### **Key Stakeholders for Education, Climate Change, and Disaster Risk Management Policy and Planning**

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<sup>48</sup> UNESCO. Cambodia: better teachers produce better students. [Available here.](#)

<sup>49</sup> MoEYS. Education Strategic Plan 2019-2023. [Available here.](#)

<sup>50</sup> Ibid, p.6

<sup>51</sup> MoEYS. Cambodia Secondary Education Blueprint 2030. p.1 [Available here.](#)

<sup>52</sup> UNESCO Institute of Statistics (UIS) (2023) [Available here.](#)

<sup>53</sup> Ibid

<sup>54</sup> Marshall (2022). [Available here](#)

The key stakeholders in Cambodia involved in the formulation and implementation of policies are described in the table below.

| <b>Institution</b>  | <b>Responsibility</b>   |
|---|---|
| Ministry of Environment                                       | Coordinates the development of climate change related policies such as the Climate Change Strategic Plan, the Nationally Determined Contributions, the National Adaptation Plan etc.  |
| National Council for Sustainable Development                  | A policy-making body established in 2015 and housed in the Ministry of Environment.<br>Promotes sustainable development through policy development.   |
| Department of Climate Change                                  | Responsible for coordinating the development and implementation of the climate change response and reporting on Cambodia's commitments under the UNFCCC.  |
| Cambodia Climate Change Alliance (CCCA)                       | A joint initiative of the Royal Government of Cambodia and development partners to address climate change in Cambodia.<br>Promotes the mainstreaming of climate change into national and sub-national policies into programmes.                     |
| Ministry of Agriculture, Forestry and Fisheries               | Manages the agriculture, forestry and fisheries sectors.<br>Develops policies and programmes and enacts legislation to regulate these sectors.  |
| Ministry of Education, Youth and Sports                       | Involved in initiatives that encourage climate action in Cambodia.<br>Develops sector strategic plans and integrates climate change education into the curriculum.  |
| Ministry of Women's Affairs                                   | Advocates for the integration of gender equality into policies and programmes.<br>Established the Gender and Climate Change Committee to supervise the overall work on gender equality in climate change, green growth and disaster risk management |
| Ministry of Economy and Finance                               | Provides the budget for climate change related activities.  |
| Department of Meteorology                                     | A department within the Ministry of Water Resources and Meteorology.<br>Manages Cambodia's meteorological stations and provides climate related data for planning.  |
| National Committee for Disaster Management (NCDM)             | Coordinates all disaster management activities.   |
| Academia  | Responsible in training and research.<br>Offer teacher training programmes for secondary school teachers  |
| UN Agencies: UNDP, UNICEF, UNESCO, UNOCHA, UNHCR              | Develops international frameworks that guide policy formulation processes.<br>Provides financial and technical support during the development and implementation of policies.   |
| Donor Agencies; USAID, UKAid, ADB, EU, World Bank, GPE, Norad | Provide financial support and technical assistance.   |

|                                |   |
|--------------------------------|---|
| NGOs – local and international | Provides technical support during policy development.<br>Implements interventions that align with policy ambitions. |
|--------------------------------|---|

## International frameworks

Cambodia has ratified the relevant international frameworks for combating climate change. These include:

- Sustainable Development Goals
- The Sendai Framework for Disaster Risk Reduction (DRR)
- Paris agreement
- Education for Sustainable Development (ESD) for 2030 framework
- United Nations Framework Convention on Climate Change
- United Nations Climate Change (UNCC): Learn strategy.

## National policies

Cambodia has made considerable progress in the development and implementation of climate change related plans and programmes as reflected in various policy documents. The review of these policies is discussed in this section. The section concludes by looking at the climate change education strategy and its implementation in the education sector.

The Constitution of the Kingdom of Cambodia, promulgated in 1993, requires the state to protect the environment and establish a precise plan of management of natural resources.<sup>55</sup> In 2015, Cambodia enacted the law of disaster management, which provides a legal framework for disaster prevention, adaptation, mitigation, emergency response and recovery.<sup>56</sup> In June 2023, the Environment and Natural Resources Code was adopted. The code initiated the environmental governance reform and embarked on a significant revision of many of the existing environmental and natural resources laws.<sup>57</sup> Among other things, the Environmental Code creates an enabling legal and policy framework to facilitate environmental protection, strengthen the conservation of natural resources and build climate resilience.<sup>58</sup>

Since 2004, Cambodia's national development has been guided by the Rectangular Strategy for Growth, Employment, Equity, and Efficiency. The Strategy is now in its fourth iteration following the successful implementation of the previous three phases. In the **Rectangular Strategy-Phase IV (2018 – 2023)**, Cambodia aims to transition into an upper middle-income country.<sup>59</sup> To achieve this, the strategy identifies the need to enhance effectiveness in protection and conservation of the environment, and in adaptation to climate change, as an important enabler in the attainment of this aim.<sup>60</sup> Additionally, the strategy identifies climate change and the loss of biodiversity, which leads to increased frequency and intensity of climate shocks such as drought, heatwave, and floods to be a

<sup>55</sup> The Constitution of the Kingdom of Cambodia. [Available here](#)

<sup>56</sup> Cambodia's Law on Disaster Management. [Available here](#)

<sup>57</sup> This Code is available but only in Khmer language. However, a review of the code is [available here](#)

<sup>58</sup> Ibid

<sup>59</sup> Cambodia's Rectangular Strategy Phase-IV (2018 – 2023). [Available here](#)

<sup>60</sup> Ibid p.2

major factor informing the country's development priorities in the medium and long term.<sup>61</sup> Consequently, the “4 Strategic Rectangles” of the strategy reflect the “4 Priority Areas” that respond to Cambodia's new phase of development.<sup>62</sup> Rectangle 4 concerns inclusive and sustainable development and includes four actions, namely; promotion of agricultural and rural development; strengthening sustainable management of natural and cultural resources; strengthening management of urbanization; ensuring environmental sustainability and readiness for climate change.<sup>63</sup>

Cambodia's **Sustainable Development Goals (CSDGs) (2016 – 2030)**, adapts the global SDGs to Cambodia's context and crafts a fully localised set of targets to guide national and sectoral development planning processes.<sup>64</sup> The CSDGs also places a high emphasis on the need for Cambodia to play its part in combating climate change. It provides an outline of how the targets in the achievement of these goals will be measured.<sup>65</sup>

During the medium-term review of the National Strategic Development Plan (NSDP) (2014 – 2018), seven key themes, among them combating climate change and deforestation, were identified as priority areas for the future development of the country.<sup>66</sup> Therefore, the **National Strategic Development Plan (NSDP) (2019 – 2023)** built on this review, while drawing from the CSDGs, and identified the need to protect the natural resources in order to meet Cambodia's commitments to climate change action, including de-carbonization of the economy.<sup>67</sup> The Ministry of Environment and the National Council for Sustainable Development are tasked with the responsibility of taking the leading role in achieving environmental sustainability by promoting public participation in environmental protection and the sustainable use of natural resources.<sup>68</sup> The plan outlines policies and priority actions for 2019 – 2023 to be carried out by relevant ministries and presents estimated values, including expenses, resources, and an expenditure programme.

The **Rural Development Strategy Action Plan (2019 – 2023)**, notes that two of the major challenges that Cambodia face are developing resilience to climate change and assuring gender equality in development.<sup>69</sup> With respect to climate change, the strategy observes that climate events, especially flooding, have the greatest impact on rural infrastructure affecting road networks, power supply, water and sanitation supply, schools, and other public services amenities.<sup>70</sup> The strategy, therefore, develops integrated ways of working for departments within the Ministry of Rural Development, that will ensure a high quality of life, characterized by climate resilient communities, in rural Cambodia.<sup>71</sup>

## Climate Change Policies

In 2009, Cambodia developed a multi-sectoral **National Green Growth Roadmap** to guide the implementation of national and local development policies and strategies in all sectors.<sup>72</sup> The Roadmap

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<sup>61</sup> Ibid p.5

<sup>62</sup> Ibid p.10

<sup>63</sup> Ibid p.15

<sup>64</sup> Cambodia's Sustainable Development Goals (CSDGs) 2016 – 2030. [Available here](#)

<sup>65</sup> Ibid p.2

<sup>66</sup> Cambodia's National Strategic Development Plan (NSDP) (2014 – 2018). [Available here](#)

<sup>67</sup> Cambodia's National Strategic Development Plan (NSDP) (2019 – 2023). [Available here](#)

<sup>68</sup> Ibid p.21

<sup>69</sup> Cambodia's Rural Development Strategy Action Plan (2019 – 2023). [Available here](#)

<sup>70</sup> Ibid

<sup>71</sup> Ibid

<sup>72</sup> Cambodia's National Green Growth Roadmap. [Available here](#)

aimed to unify the approach to be adopted in all ministries by addressing seven A's; access to clean water and sanitation; access to renewable energy; access to information and knowledge; access to means for better mobility; access to finance and investments; access to food security and; access to sustainable land-use.<sup>73</sup> The roadmap notes that these access issues will be addressed through green economic growth programmes and low carbon solutions which can create new jobs that preserve or restore the environment.<sup>74</sup>

In 2013, the **National Strategic Plan on Green Growth (NSPGG) 2013 – 2030** was prepared to move Cambodia towards a green economy by integrating environmental protection and sustainable natural resources management into economic growth plans.<sup>75</sup> The strategy aims to achieve its objectives by focussing on green investment and green jobs creation, green environment and natural resources management, human resources development and green education among other priority areas.<sup>76</sup>

Cambodia's **Climate Change Strategic Plan (2014 – 2023)** was developed in 2013 to create a national framework for stakeholders to engage in a participatory process for responding to climate change in sustainable ways.<sup>77</sup> To support the implementation of this strategy, 15 government institutions and ministries formulated sector relevant climate change action plans, comprising of 171 climate action projects (93 percent on adaptation and 7 percent on mitigation).<sup>78</sup> The Ministry of Environment, for instance developed the **Climate Change Action Plan (2016 – 2018)** that provide response guidance for the Ministry, and includes interventions through environmental education, environmental protection, biodiversity conservation, and natural resources.<sup>79</sup>

The Guidelines for Integrating Climate Change Considerations into Commune Development Planning, were developed in 2014 by the Ministry of Environment to increase the resilience of coastal communities and ecosystems to climate change through adaptation planning, and provision of practical learning experience in adaptation planning.<sup>80</sup>

In 2006, Cambodia developed the **National Adaptation Programme of Action (NAPA)** to Climate Change.<sup>81</sup> The objectives of the NAPA were to understand the main characteristics of climate hazards in Cambodia; understand coping mechanisms to climate hazards and climate change at the sub-national level; understand existing programmes and institutional arrangements for addressing climate hazards and climate change; identify and prioritise adaptation activities to climate hazards and climate change.<sup>82</sup>

The **Updated Nationally Determined Contribution (2020)** strengthens Cambodia's aspirations towards a cleaner and greener economy and commitments to improve the lives of all Cambodians, especially the most vulnerable.<sup>83</sup> The NDC identifies 58 priority adaptation activities in 9 sectors: agriculture;

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<sup>73</sup> Ibid p.18

<sup>74</sup> Ibid

<sup>75</sup> Cambodia's National Strategic Plan on Green Growth (2013 – 2030). [Available here](#)

<sup>76</sup> Ibid p.4

<sup>77</sup> Cambodia's Climate Change Strategic Plan (2019 – 2023). [Available here](#)

<sup>78</sup> Parliamentary Institute of Cambodia (2018). Review of Implementation of challenges posed by the climate change action plan 2014-2018 in Cambodia: case studies of three ministries. [Available here](#)

<sup>79</sup> Ministry of Environment. Climate Change Action Plan (2016 – 2018). [Available here](#)

<sup>80</sup> Cambodia's Guidelines for Integrating Climate Change Considerations into Commune Development Planning. [Available here](#)

<sup>81</sup> Cambodia's National Adaptation Programme of Action to Climate Change. [Available here](#)

<sup>82</sup> Ibid p.2

<sup>83</sup> Updated Nationally Determined Contribution. [Available here](#)

coastal areas; energy; human health; industry; infrastructure; livelihoods, poverty and biodiversity; tourism; and water resources.<sup>84</sup> It also prioritizes 29 diverse activities in areas including education (4 actions), gender (6 actions), information (4 actions), governance (2 actions), and knowledge sharing (1 action), and policy and planning (12 actions).<sup>85</sup> The updated NDC addresses the gaps in the initial NDC by including gender, youth involvement, and private sector engagement as cross-cutting areas in the development of all actions.<sup>86</sup> The four actions in the education sector are listed in the table below;

| No. | Action  | Cross-cutting | Lead Ministry |
|-----|---|---------------|---------------|
| 1   | Upgrading curriculum and training methodologies, including libraries, to include climate change subjects in primary schools | Education     | MOEYS         |
| 2   | Upgrading curricula to include climate change for non-formal education  | Education     | MOEYS         |
| 3   | Build centres of excellence for delivering climate change courses and research among Universities                           | Education     | MOEYS         |
| 4   | Conduct training for education officials on climate change e.g. as a required component of teacher training                 | Education     | MOEYS         |

**Source: Updated Nationally Determined Contribution. [Available here](#)**

Cambodia's developed its **National Adaptation Plan (NAP)** in 2017 with the aim of strengthening ongoing climate change adaptation processes through cross-sectoral programming at both the national and sub-national levels.<sup>87</sup> The NAP identifies activities and initiatives that would reduce vulnerabilities to the adverse effects of climate change and facilitate the integration of these activities into policies, strategies and plans.<sup>88</sup>

In 2021 Cambodia developed the **Long-Term Strategy for Carbon Neutrality**.<sup>89</sup> The strategy outlines priority mitigation actions for each sector to achieve Cambodia's goal of a carbon-neutral economy by 2050. The strategy builds on existing commitments and proposes a trajectory consistent with the Updated Nationally Determined Contribution.<sup>90</sup> The strategy provides mitigation actions for six key sectors. These are agriculture; forestry and land use; energy; transport; industrial processes and product use; and waste.<sup>91</sup>

### **Cambodia's efforts to address climate change**

<sup>84</sup> Ibid p.34

<sup>85</sup> Ibid p.38

<sup>86</sup> Ibid p.40

<sup>87</sup> Cambodia's National Adaptation Plan. [Available here](#)

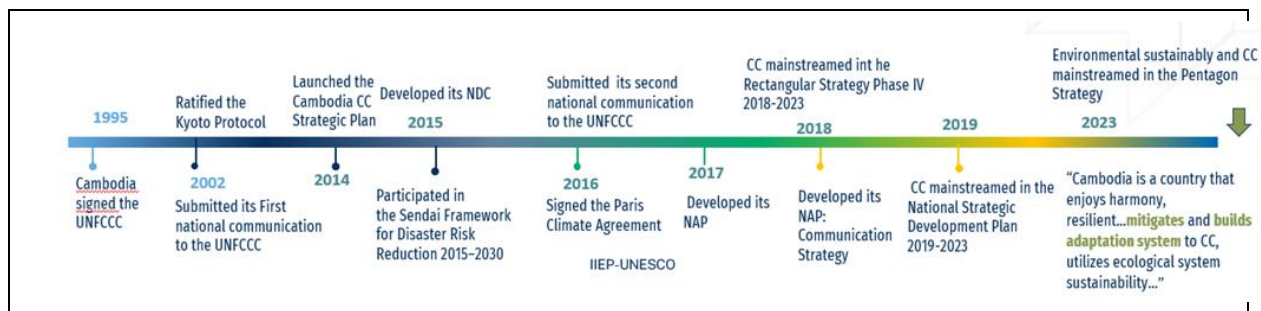
<sup>88</sup> Ibid

<sup>89</sup> Cambodia's Long-Term Strategy for Carbon Neutrality. [Available here](#)

<sup>90</sup> Ibid

<sup>91</sup> Ibid





Source: IIEP-UNESCO, 2023

## Disaster Risk Management Policies and Guidance

The National Committee for Disaster Management (NCDM) is the key agency responsible for disaster management in Cambodia. At the national level it consists of 22 members from different ministries, Cambodian armed forces, the Civil Aviation Authority and the Cambodian Red Cross. It supports provincial, district and commune committees. Village Disaster Management Groups are the lowest-level bodies.<sup>92</sup>

Cambodia's **Disaster Management (DM)** law was passed in 2015 with the objective of regulating disaster management. The law provides a legal framework for action in the pre-disaster period, during the disaster and in the post-disaster period.<sup>93</sup> The law is linked to both the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) and the Sendai Framework.<sup>94</sup>

The **National Action Plan for Disaster Risk Reduction (NAP DRR) (2014 – 2018)**, was developed in 2014 with the aim of building a resilient nation both nationally and sub-nationally.<sup>95</sup> This action plan was designed to replace the **Strategic Action Plan for DRR (2008 - 2013)**<sup>96</sup> whose gaps included slow and uneven integration of DRR into development processes and insufficient geographic coverage and depth of DRR initiatives at community level.<sup>97</sup> The NAP-DRR aligns its objectives with key the AADMER and key national policies and strategies including the NSDP (2014 – 2018), the Climate Change Response Strategic Plan (2014 – 2023) and the National Education Strategic Plan (2009 – 2013).<sup>98</sup>

The continuation of the **NAP 2024-2028** emphasizes the importance of mainstreaming disaster risk reduction into the education sector. It recommends that the Ministry of Education, Youth and Sports incorporate DRR and climate change adaptation into school curricula, teacher training programmes, and education planning at all levels. The plan calls for strengthening school safety through the implementation of the Comprehensive School Safety Framework, which includes safe learning facilities, school disaster management, and risk reduction education. **Key priorities for education and DRR include:** conducting risk assessments of school buildings and infrastructure; developing school disaster management plans; training teachers and students on disaster preparedness; integrating DRR topics into subjects like geography and science; organizing school-based DRR activities and drills; establishing early warning systems in schools; and ensuring continuity of education during and after disasters. The document also highlights the need to raise awareness among students, teachers, and parents about local hazards and risk reduction measures.

<sup>92</sup> Open Development Cambodia. [Available here](#)

<sup>93</sup> Cambodia's Law on Disaster Management. [Available here](#)

<sup>94</sup> Ibid

<sup>95</sup> Cambodia's National Action Plan for Disaster Risk Reduction (NAP DRR) 2014 – 2018. [Available here](#)

<sup>96</sup> Cambodia's Strategic Action Plan for DRR (2008 - 2013). [Available here](#)

<sup>97</sup> Cambodia's National Action Plan for Disaster Risk Reduction (NAP DRR) 2014 – 2018. [Available here](#)

<sup>98</sup> Ibid



Additionally, the NAP recommends collaboration between the education sector and other relevant ministries and stakeholders to enhance overall disaster resilience. This includes working with the National Committee for Disaster Management to conduct joint planning, implementation and monitoring of DRR initiatives in schools. Overall, the NAP-DRR views education as a critical sector for building a culture of safety and resilience in Cambodia, starting with the youth population. The goal is to create disaster-aware and prepared schools that can withstand hazards and continue providing quality education even in times of crisis.

### **Climate Change in Education Policies**

This section looks at the education sector development plans and strategies and the extent to which climate change and disaster risk management are addressed.

**Cambodia's Education 2030 Roadmap** recognizes the role of education in fostering environmental sustainability, highlighting the need for social protection measures to increase the resiliency of rural and urban communities against the adverse effects of climate change and pointing towards the national climate change strategic plan that aims to mainstream a climate change response across government agencies.

The priorities of Cambodia's education sector are outlined in the four-year Education Strategic Plans developed by the Ministry of Education, Youth and Sports. In the **Education Strategic Plan (2014 – 2018)**, the need to train teachers, students and stakeholders on measures that prevent disasters and climate change risks was included as one of the activities under the sanitation and environment education programme.<sup>99</sup> Additionally, awareness of climate change was identified as one of the activities to be included in the life skills programmes at secondary schools.<sup>100</sup>

**The MoEYS's subsequent Education Strategic Plan (ESP) 2019-2023** included several climate-related policy actions, including:

- Develop eco-friendly standards for pre-primary, primary, and secondary schools;
- Develop disaster management plan;
- Schools use the school improvement fund for activities, such as making provisions for natural disaster management.

The Cambodia Education Strategic Plan (ESP) 2024-2028 recognizes climate change as a significant risk to education, potentially disrupting schooling, damaging infrastructure, and affecting students' health and food security. To address these challenges, the ESP integrates several adaptation measures and environmental sustainability initiatives across its programmes. These include constructing climate-resilient school infrastructure, developing an operational plan on climate change for the education sector, and integrating climate change topics into school curricula. The plan also aims to increase enrolment in STEM majors related to climate change adaptation and mitigation. Environmental sustainability is promoted through initiatives such as "clean schools" programmes, environmental clubs, and reducing plastic use. The ESP plans to conduct research on climate change impacts on the school system and recognizes the need for policy measures to build climate resilience in education. While not a primary focus, climate change and sustainability considerations are woven throughout the

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<sup>99</sup> Cambodia's Education Strategic Plan (2014 – 2018). [Available here](#)

<sup>100</sup> Ibid p.33

ESP, demonstrating Cambodia's commitment to building an education system that is both aware of and resilient to environmental challenges.<sup>101</sup>

## Strategies for education AND climate change

The **Climate Change Strategic Plan for Education (2013-2018)** comprehensively outlines the role of the education sector can play in enabling response capacities for both climate adaptation and climate mitigation.<sup>102</sup> The strategy identifies potential activities that can enhance the response of the education sector to the impacts of climate change. These activities include the development of modules on climate change, environmental education, and natural hazard preparedness and response.<sup>103</sup> Additionally, the strategy provides 11 priority activities that will enable Cambodia's young people to gain knowledge and skills on climate change.<sup>104</sup>

The implementation of the Climate Change Strategic Plan for Education is realized through the **Climate Change Action Plan for Education (2014 – 2018)**.<sup>105</sup> The plan provides a framework for the integration of climate change courses and training programmes in both formal and non-formal education, while taking into consideration gender disparity and inequality in education.<sup>106</sup> The plan proposes capacity development for teachers, students, and communities in the understanding of climate change adaptation and mitigation opportunities for sustainable development. Four priority areas have been identified in the plan. These are: (1) enhancing education policy and planning to build resilience capacity; (2) improving quality of climate change education in formal education; (3) raising awareness and mainstreaming climate change in non-formal education; and (4) climate-proofing education infrastructure.<sup>107</sup>

The overarching guidance on the role of education in addressing climate change related issues is outlined in the Climate Change Strategic Plan for Education (2014 – 2023). In addition, the implementation of this strategic plan is described in the Climate Change Action Plan for Education (2014 – 2018). Essentially, the action plan focusses on the development of different learning modules on climate change, environmental education, natural hazard preparedness and response and the training of trainers on climate change.<sup>108</sup> To support these priority issues, the plan maps out action plans for each of the four strategies identified in the Climate Change Strategic Plan for Education.<sup>109</sup> The summary of these action plans is provided in the table below.

| Strategy   | Action Plan   |
|--|---|
| Improve education policy and planning for building resilience capacity | <ol style="list-style-type: none"> <li>1. Develop educational policy, carry out research and policy analyses for climate change adaptation and mitigation.</li> <li>2. Strengthen capacity of relevant departments within MoEYS.</li> </ol> |

<sup>101</sup> Cambodia's Education Strategic Plan 2024-2028. [Available here](#)

<sup>102</sup> Cambodia's Climate Change Strategic Plan for Education (2014 – 2023). [Available here](#)

<sup>103</sup> Ibid p.11

<sup>104</sup> Ibid

<sup>105</sup> Climate Change Action Plan for Education (2014 – 2018). [Available here](#)

<sup>106</sup> Ibid p.4

<sup>107</sup> Ibid p.6

<sup>108</sup> Climate Change Action Plan for Education (2014 – 2018). [Available here](#)

<sup>109</sup> Ibid p.7

|   |   |
|---|---|
|   | 3. Promote university and centres of excellence to deliver climate change courses and carry out research.   |
| Improve education quality in formal education                                 | <ul style="list-style-type: none"> <li>• Upgrading curricula and training methodologies to include climate change content in primary and secondary schools</li> </ul>                         |
| Promote awareness and mainstreaming of climate change in non-formal education | <ul style="list-style-type: none"> <li>• Upgrading curricula to include climate change for non-formal education and Buddhism schools.</li> </ul>  |
| Promote green concepts and climate proofing education institutions            | <ul style="list-style-type: none"> <li>• Climate proofing and retrofitting existing education infrastructure.</li> <li>• Integration of green-growth concepts in education sector.</li> </ul> |

The plan also estimates the financial implications for the implementation of the proposed activities.

### Disaster Risk Management

The NAP-DRR notes that the approach taken by the MoEYS to enhance education to be resilient to disasters, which involves building resilient infrastructure, has had limited implementation.<sup>110</sup> The plan recommends promoting a culture of prevention among the people through the education sector.<sup>111</sup> Consequently, the third strategic component of the NAP-DRR lists the key activities within the education sector which will ensure disaster resilience in primary and secondary schools.<sup>112</sup> These include: implementing school construction guidelines, inclusion of DRR in the education sector plan, inclusion of DRR into the curriculum for all grades, and developing contingency plans for all schools in disaster-prone areas. Simultaneously, the strategy advocates for the inclusion of DRR into academic programme of the selected universities and the development of specific curriculum for general and technical universities (agriculture, environment, medical) to include courses in regular masters and bachelor programme.<sup>113</sup>

The NAP 2024-2028 emphasizes the importance of mainstreaming DRR into the education sector. It recommends that the Ministry of Education, Youth and Sports incorporate DRR and climate change adaptation into school curricula, teacher training programmes, and education planning at all levels. The plan calls for strengthening school safety through the implementation of the Comprehensive School Safety Framework, which includes safe learning facilities, school disaster management, and risk reduction education. **Key priorities for education and DRR include:** conducting risk assessments of school buildings and infrastructure; developing school disaster management plans; training teachers and students on disaster preparedness; integrating DRR topics into subjects like geography and science; organizing school-based DRR activities and drills; establishing early warning systems in schools; and ensuring continuity of education during and after disasters. The document also highlights the need to raise awareness among students, teachers and parents about local hazards and risk reduction measures. Additionally, the plan recommends collaboration between the education sector and other relevant ministries and stakeholders to enhance overall disaster resilience. This includes working with the National Committee for Disaster Management to conduct joint planning,

<sup>110</sup> NAP-DRR. [Available here](#)

<sup>111</sup> Ibid

<sup>112</sup> Ibid p.30

<sup>113</sup> Ibid p.30

implementation and monitoring of DRR initiatives in schools. Overall, the NAP-DRR views education as a critical sector for building a culture of safety and resilience in Cambodia, starting with the youth population. The goal is to create disaster-aware and prepared schools that can withstand hazards and continue providing quality education even in times of crisis.<sup>114</sup>

The Education Strategic Plan (2019 – 2023) allows schools to use the school improvement fund for activities such as making provisions for natural disaster management. Various other initiatives have been implemented, including integrating DRR in Grade 8's earth science and geography subjects and developing school construction guidelines.<sup>115</sup>

The Education Strategic Plan 2024-2028 demonstrates a more comprehensive approach to DRR compared to its predecessor. Recognizing the increasing impact of climate change on education, the plan integrates resilience measures across multiple domains. It prioritizes the development of climate-resilient school infrastructure, emphasizing construction and renovation projects that adhere to inclusive and accessible principles. Curriculum updates are planned to incorporate climate change education, particularly for grades 4-6, complemented by an ambitious goal to train all pre-school teachers on climate change resilience by 2028.<sup>116</sup>

In 2023, MoEYS endorsed the revision of the “Child-Friendly School Program,” focusing on the Safe School Framework. The document has been updated by interdepartmental working groups, including the Department of Curriculum Development, the Department of Primary Education, the Department of Health, and the Department of Education and Training. These documents are revised to align with the ASEAN Common Framework for Comprehensive School Safety 2022-2030 which is also based on the Comprehensive Safe School Framework 2022-2030, and they address new issues affecting education and disasters in Cambodia. The documents emphasize promoting health, safety, and protection of children in schools at risk from disasters, climate change, infectious diseases, and other hazards. The updates target general education schools, partner organizations, and development agencies working in education in Cambodia. They also aim to build projects that promote children's rights and safety, resilience in education, a comfortable learning environment, friendly, improved school facilities, effective school management, disaster risk reduction, and climate change. This new updated version advocates participatory methods to identify risks and protect educators and students from accidents, abuse, injury, and death in educational settings. Additionally, the updated programme supports the implementation of the Sendai Framework (2015-2030) and the Law on Disaster Management in Cambodia.<sup>117</sup>

### 2.1.3 Alignment with other projects

The development of the BRACE project in Cambodia has included a wide range of consultations with organising and individuals involved in education and climate change in Cambodia (see Annex 7 Stakeholder consultations). BRACE is designed to build on and compliment a range of current and recently completed projects. A table of key investments relevant to BRACE is provided below, with information on how BRACE will be complementary and coherent and prevent duplication and overlap.

| Project details | Description | Points of complementarity |
|-----------------|-------------|---------------------------|
|-----------------|-------------|---------------------------|

<sup>114</sup> NAP-DRR unofficial translation.

<sup>115</sup> Cambodia's Disaster Management Reference Handbook. [Available here](#)

<sup>116</sup> Cambodia Education Strategic Plan 2024-2028.

<sup>117</sup> Support documents for “Child-Friendly Program”: Safe School Framework, updated 2023

|  |   |   |
|--|---|---|
| <p><b>Title: Green Generation</b><br/> <b>Dates of the project: 2022-2025 (3 phases)</b><br/> <b>Total USD: 380.000</b><br/> <b>Donor: Save the Children Norway, Wiersholm, Metier</b></p> | <p>Green Generation was initiated and co-developed by WWF and Save the Children in Myanmar in 2019 and has since then been tested and contextualized for several countries, including Cambodia, Guatemala, Palestine, Syria and Lebanon.</p> <p>Green Generation is a programming model offering learning opportunities for children and youth on locally relevant issues linked to climate change and the environment. Teaching and learning units as well as a facilitator guide and ToT modules have been developed to rapidly respond to the urgent need for climate change and environmental education, based on a project-based learning approach. It can be delivered as integrated lessons in the formal classroom teaching, supporting implementation of the curriculum, or it can be delivered in non-formal, extracurricular settings like after-school clubs.</p> <p>The teaching and learning units which have been contextualized and implemented in Cambodia focus on the following thematic topics;</p> <ul style="list-style-type: none"> <li>• Why Nature Matters</li> <li>• Our Forests</li> <li>• Deforestation</li> <li>• Waste and Litter</li> <li>• Water Consumption and Water Pollution</li> <li>• Wildlife</li> </ul> <p>In addition to these contextualized materials, the project also provides schools with eco-boxes containing</p> | <p>The BRACE project will enable a scale-up of the Green Generation activities, providing access to climate change and environmental education for 2,166 (932 girls) number of children and youth, both as integrated lessons in classroom teaching and in informal learning settings in after-school clubs.</p> <p>BRACE will enable further strengthening and development of additional teaching and learning resources focusing on climate change and disaster preparedness among others, as well as capacity development for teachers and facilitators, documentation of effects and lessons learnt which will contribute to a strengthening of the evidence base for the Green Generation approach.</p> <p>Green Generation is a parallel and complementary action to offer immediate learning opportunities for children and youth while at the same time supporting the formal curriculum development process and teacher professional development linked to climate change and environmental education, at system level. The experiences, lessons learnt, and teaching and learning resources from Green Generation are brought into formal curriculum development processes and relevant policy dialogues.</p> |
|--|---|---|

|  |  |  |
|--|--|--|
|  | <p>different instructional and practical material for implementation of the environmental education activities.</p> <p>The material is designed for project-based learning. Children take the lead, identify priorities, make decisions and implement actions. The activities provide practical, first-hand experiences and encourage children themselves to identify and solve real life environmental problems critically and creatively in their own communities and schools. As part of the model, children themselves are conducting environmental assessments and prepare, implement, and evaluate action plans.</p> <p>The Green Generation modules have been formally approved and signed off by the MOEYS in Cambodia on 25th April 2024 and are currently being implemented in close collaboration with the Provincial/District Offices of Education, Youth and Sport and of Environment in 22 primary schools around the Tonle Sap Lake, which is heavily impacted by climate change and environmental destruction.</p> <p>The children participating in Green Generation in Cambodia have experienced several wins based on their environmental actions and campaigns, like funding for an improved waste management system made available on the commune council's budget, behaviour shifts among parents and community members, and a significant increase among</p> |  |
|--|--|--|

|   |  |   |
|---|--|---|
|   | <p>children and teachers in their knowledge and awareness about climate change and environmental issues.</p> <p>The project also works outside school boundaries by working with the local administration authority, which is the Commune Council, to mobilize their official recognition and support for the successful implementation of environment education at scale.</p> |   |
| <p><b>Title: Local Life Skills Education (LLSE) Programme</b><br/> <b>Dates of the Project: 2024-2027</b><br/> <b>Implemented by: UNICEF and the GPE's Multiplier as an additional financing to the System Transformation Grant (STG), for a total amount of US\$10,000,000</b></p> | <p>The school-based Local Life Skill Education (LLSE) programme, implemented by UNICEF Cambodia in partnership with the MoEYS, encourages students, parents, local experts and communities to work together to identify and solve local problems related to climate change and environmental issues using a</p>  | <p>The gaps revealed from the successful implementation of the LLSE show the need for a more scaled approach. In essence the project is working well to address a number of school and community engaged school-related needs, many of which are climate driven.</p> <p>LLSE is implemented by UNICEF, with the below activities being implemented as part of the BRACE</p> |

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| <p><b>(Co-Financing: US\$ 500,000 to BRACE)</b></p> | <p>six-step problem-based learning approach.<sup>118</sup> The LLSE programme is offered as a subject that develops students' knowledge of real-world issues and empowers them with the essential soft skills needed to take action. The subject takes students out of the classroom and into the community to collect data by talking to villagers and local experts, raise awareness of key climate change issues.<sup>119</sup> The Green Village project, for instance, forms part of LLSE programme for Grade 8 students at Thmor Taprum Lower Secondary School in Stung Treng province.<sup>120</sup> The project has reached 301 households comprising of 1,472 people.</p> <p>By April 2023, 294 schools in Cambodia had implemented the LLSE programme with 86 schools focusing on solving climate change and environment related challenges, reaching about 25,800 students in Grades 7-9.<sup>121</sup> Following the successes of the programme, UNICEF planned to provide technical support for the development of a special module on climate change to be piloted in 2023.<sup>122</sup></p> <p>The GPE's Multiplier fund contribute to system transformation through the development of a skilled, professional and motivated</p> | <p>co-financing, funded by GPE. The below activities are designed to synergise with BRACE and will be implemented in different provinces to deliver impact at scale:</p> <ul style="list-style-type: none"> <li>• Activity 1: Capacity building for district officials, principals, and teachers to support the implementation and scale-up of green skills focused LSE programmes at the school level, with a focus on women.</li> <li>• Activity 2: Development of a mentoring system to support the implementation of LSE at the school level, with a focus on women.</li> <li>• Activity 3: Integration of green skills for LSE into pre-service teacher training programmes for both primary and secondary education.</li> <li>• Activity 4: Capacity building for TEC and RTTCs directors and trainers including cooperative schools on green skills-focused LSE programme.</li> <li>• Activity 5: Develop soft skills assessments tool for classroom teachers and integrate these into the inspection system.</li> </ul> |
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<sup>118</sup> UNICEF. Local Life Skill Education (LLSE) programme. [Available here](#)

<sup>119</sup> Students empowered to take action against rubbish. [Available here](#)

<sup>120</sup> Ibid

<sup>121</sup> UNICEF. Local Life Skill Education (LLSE) programme. [Available here](#)

<sup>122</sup> Ibid



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|  | <p>teaching workforce, providing and strengthening both pre-service and in-service development opportunities for teachers and teacher educators to positively impact student learning outcomes in an equitable manner.</p> <p>The Multiplier's Programme Component:</p> <ol style="list-style-type: none"> <li>1. Teacher Education – Supporting TEIs to cultivate teaching excellence.</li> <li>2. Classroom Learning – Building capacity for effective Early Grade learning and teaching (Mapping to STG program as Component 3)</li> <li>3. Access to Education – Promote equitable access to inclusive quality education for vulnerable children. (Mapping to STG program as Component 5)</li> </ol>                     |  |
| <p><b>Title: 'Mainstreaming Climate Change and Increasing Resilience in the Education Sector', Cambodia Climate Alliance – Phase III (CCCA3)</b></p> <p><b>Dates of the Project: 2019-2024</b></p> <p><b>Implemented by: Ministry of Education, Youth and Sports (MoEYS)</b></p> <p><b>Partnership: UNDP, Sweden, the European Union, and the government of Cambodia through the National Council for Sustainable Development.</b></p> <p><b>Budget: US\$549,320 (Co-Financing: US\$ 49,329)</b></p> | <p><b>Geographies covered:</b> Kampong Chhnang, Svay Reing Stung Treng, Kampong Speu, Kampot, Kratie and Battambang Province.</p> <p>Specific objectives included:</p> <ol style="list-style-type: none"> <li>1. Develop teaching and learning materials on climate change education for primary schools and pilot these materials through Eco-schools;</li> <li>2. Develop booklets on climate change response and support increasing resilience of pilot primary schools through WASH training and climate-smart investments supporting WASH and health;</li> <li>3. Provide mentoring and strengthening to established Eco-schools for sustainable implementation; and</li> <li>4. Develop booklets on climate</li> </ol> | <p>The BRACE project has been designed to complement CCCA3 by scaling up support for climate-resilient education and addressing aspects of the CSSF that are not covered by CCCA3, as further detailed below:</p> <ul style="list-style-type: none"> <li>• <b>Geographical coverage and scope:</b> The materials developed under CCCA3 are intended for inclusion in the national curriculum; however, only a few schools were selected for the pilot project. BRACE will continue to support on this goal by further developing the climate-related learning materials for nationwide implementation in both formal and informal curricula. Moreover, BRACE includes targeted interventions in Kampong</li> </ul> |

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|  | <p>change response and support for increasing resilience of secondary Eco-schools through WASH training and climate-smart investments supporting WASH and health.</p> <p>The project aims to benefit 21,412 students (9,923 female), 726 teachers (300 female), 106 school principals (39 female).</p> <p>CCCA3 focuses primarily on a single component (namely, eco-schools) of the Comprehensive School Safety Framework (CSSF).</p>  | <p>Cham and Koh Kong, which are not covered under CCCA3.</p> <ul style="list-style-type: none"> <li>• <b>Infrastructure:</b> BRACE will strengthen the climate resilience of school infrastructure through physical retrofitting of school facilities, including for WASH, internet connectivity, and PV systems</li> <li>• <b>Educational continuity:</b> BRACE will deliver training, capacity building, equipment and tools to strengthen school safety and educational continuity systems, including through teacher education systems (e.g., government training centres, pre-service and in-service teacher training), child clubs and mentoring.</li> </ul>  |
| <p><b>Title: Enhancing Climate Change Resilience of Rural Communities Living in Protected Areas of Cambodia</b><br/> <b>Dates of the Project: 2013-2021</b><br/> <b>Implemented by: UNEP and the Government of Cambodia</b><br/> <b>Project Partners: MAFF, MoWRAM, MLMUPC</b><br/> <b>Budget: US\$5 million from the Adaptation Fund (AF)</b></p> | <p>The 'Enhancing Climate Change Resilience of Rural Communities Living in Protected Areas of Cambodia' project aimed to enhance resilience of communities living around five Community Protected Area (CPA) intervention sites, as well as downstream communities, to the climate change-induced hazard of erratic rainfall. This was to be achieved through three components:</p> <ol style="list-style-type: none"> <li>1) Conducting biophysical, ecological and socio-economic research to develop restoration protocols for eco-agriculture interventions</li> <li>2) Using the information generated under component 1 to implement</li> </ol> | <p>Both BRACE and the AF-funded project aim to enhance climate change resilience of communities but will achieve this aim in different and complementary ways. BRACE focuses on building climate resilience through the education sector (specifically, by establishing a safe learning environment in and around schools and supporting education continuity and resilient education), whereas the AF-funded project focuses on building resilience of agricultural livelihoods and eco-agriculture.</p> <p>BRACE will complement the efforts to establish school vegetable gardens under the 'Seeding the Future' initiative through its support for climate-resilience life skill development amongst primary school children.</p> |

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|  | <p>on the ground forest restoration (multi-use forests) and conservation agriculture interventions in target sites</p> <p>3) Institutional capacity, awareness-raising, and upscaling of eco-agriculture interventions.</p> <p>‘Seeding the Future’<sup>123</sup> is only one of the initiatives of the project, which supported the establishment of school vegetable gardens and water-pumps for irrigation, as well as provided training on growing vegetables.</p> <p>The project also supported more than 6,000 people to supplement often dwindling incomes from rain-fed crops and to build sustainable local economies for generations to come.</p> |  |
| <p><b>Title: General Education Improvement Project (GEIP)</b></p> <p><b>Dates of the Project: 2022-2028</b></p> <p><b>Implemented by: World Bank</b></p> <p><b>Total USD: \$20 million in additional financing through the GPE Multiplier grant, along with \$60 million in IDA credit, to scale up activities of the parent GEIP project.</b></p> | <p>The Additional Financing for the General Education Improvement Project (GEIP) in Cambodia aims to enhance the quality and equity of education through a comprehensive approach. At its core, the project focuses on improving school-based management across general education, empowering local administrators to make decisions that best suit their students' needs. This effort is complemented by intensive training and upgrading programmes for teachers and school principals, ensuring that educators are equipped with the latest pedagogical skills and knowledge.</p> <p>To address disparities in educational access, the project</p>       | <p>The project contributes activities and complements BRACE as follows:</p> <p><b>1.1: Improving School-Based Management across General Education</b></p> <p>This includes (a) training and education for school administration and teachers, community representatives, local authority members, and subnational education officials on climate change, including lessons on local climate impacts and responses and planning for climate-resilient schools; and (b) central-level SBM support to build school-specific climate resilience. Total: US\$9.9 million, of which IDA: US\$4.0 million; GPE: US\$5.9 million</p> |

<sup>123</sup> UNEP (2019). Seeding the future: school children in Cambodia pave the way for climate adaptation. Available [here](#)

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|  | <p>will work on improving equitable access to quality learning environments. This includes not only physical infrastructure improvements but also creating inclusive spaces that cater to diverse learning needs. A significant aspect of this inclusivity is the implementation of disability screening programmes and providing additional support for students with disabilities, ensuring that all children have the opportunity to learn and thrive.</p> <p>Recognizing the growing importance of technology in education, the project will pilot digital education initiatives. These pilots will explore innovative ways to integrate technology into teaching and learning, preparing students for an increasingly digital world.</p> <p>Alongside these direct interventions in schools, the project will support the implementation of broader education sector reforms. This includes strengthening project management capacity within the Ministry of Education, Youth and Sport (MoEYS) and other relevant agencies. By enhancing managerial skills and processes, the project aims to ensure more efficient and effective delivery of educational services.</p> | <p><b>1.2: Training and Upgrading Teachers and School Principals</b><br/>This includes (a) helping improve climate knowledge for disaster preparedness among teachers and school administrators who are responsible for imparting climate education to their students and (b) developing capabilities for teachers and school administrators to conduct remote learning/e-learning.<br/>Total: US\$10.5 million, of which IDA: US\$7.1 million; GPE: US\$3.4 million</p> <p><b>1.3: Improving Equitable Access to Quality Learning Environment</b><br/>This includes supporting climate-informed construction and renovation activities<br/>Total: US\$43.6 million, of which IDA: US\$37.6 million; GPE: US\$6.0 million</p> |
| <p><b>Title: Climate Smart Education Systems Strategic Capability Initiative</b><br/><b>Dates: 2024-2025</b><br/><b>Total USD: 700,000\$</b><br/><b>Donor: GPE</b></p> | <p>Funded by the Global Partnership for Education (GPE), CSESI seeks to enhance countries' capacities to mainstream climate change adaptation and environmental sustainability into education</p>   | <p>The project builds the foundation for the BRACE through the technical assistance of 7 pillars:</p> <ul style="list-style-type: none"> <li>Education ministries have enhanced capacities to develop evidence-based policies and plans for climate</li> </ul>  |

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|  | sector plans, budgets and strategies as well as to enhance education ministry capacity for cross-sectoral coordination on climate and environment-related policy and programming. | <p>change adaptation and environmental sustainability</p> <ul style="list-style-type: none"> <li>• Education sector coordinates effectively internally and with other sectors around climate change policy and programming (including disaster risk management mechanisms)</li> <li>• Education ministries are able to access increased climate financing for education sector activities</li> <li>• Education sector has timely access and capacity to use climate-related data and integrates it into its planning and monitoring systems</li> <li>• Education ministries are better equipped to improve the resilience of schools to climate risks, including enhanced capacity to strengthen school safety and educational continuity management</li> <li>• Education system integrates climate change and environmental sustainability into curricula, pedagogy, and teacher training.</li> </ul> |
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#### ***GCF Readiness Proposals***

| <b>Project Title</b>   | <b>NDA/Accredited Entity/Delivery Partner</b> | <b>Status</b>                  |
|--|---|--------------------------------|
| NDA Strengthening and Country Programming support for Cambodia through Ministry of Environment | NDA   | Activities in-country complete |
| Strategic frameworks support for Cambodia through GGGI   | Global Green Growth Institute                 | Activities in-country complete |
| Strategic frameworks support for Cambodia through Mekong Strategic Partners                    | Mekong Strategic Partners                     | Activities in-country complete |

|  |   |                                |
|--|---|--------------------------------|
| Strategic frameworks support for Cambodia through UNIDO  | United Nations Industrial Development Organization                | Activities in-country complete |
| Support to Direct Access Entity in Cambodia to meet accreditation conditions   | National Committee for Sub-National Democratic Development (NCDD) | Activities in-country complete |
| Enhanced actions to respond to climate change through sustainable waste management in Coastal Cities in Cambodia                                 | UN-Habitat  | Activities in-country complete |
| Climate Technology Deployment Roadmap for E-mobility Ecosystem in Cambodia   | Green Technology Center   | Activities in-country complete |
| Resilient Recovery Rapid Readiness Support in Cambodia   | National Council for Sustainable Development of Cambodia          | Current                        |
| Establishing an Evidence-Based National Adaptation Plan (NAP) process at National and Subnational Scales in Cambodia Phase 1                     | National Council for Sustainable Development of Cambodia          | Current                        |
| Agriculture Sector Readiness for enhanced climate finance and implementation of Koronivia Joint Work on Agriculture priorities in Southeast Asia | Food and Agriculture Organization of the United Nations           | Current                        |
| Readiness Support for the Implementation of the IRMF for DAE (Fast-Track)  | Korea Development Bank  | Current                        |
| Capacity building and accreditation support of Direct Access Entity to private banks for on-lending and/or blending fiduciary functions          | Global Green Growth Institute                                     | Current                        |
| Development of a Sub-national Climate Fund to accelerate local climate action in Cambodia  | National Committee for Sub-National Democratic Development        | Current                        |

## 2.2 Climate change context

Cambodia is a Southeast Asian nation bordered by Thailand to the west and northwest, Laos to the north, Vietnam to the east and south, and the Gulf of Thailand to the southwest. Covering an area of approximately 181,035 km<sup>2</sup>, Cambodia is characterized by its low-lying central plains surrounded by mountainous regions and the mighty Mekong River that flows through much of the country. Phnom Penh, located at the confluence of the Mekong, Bassac, and Tonlé Sap rivers, serves as the nation's political, economic, and cultural capital.

Cambodia is home to a population of over 16 million people (2023), with Khmer being the predominant ethnic group, making up approximately 90% of the population. Khmer is also the official language. Other ethnic groups, such as Cham and Vietnamese, contribute to the nation's cultural diversity. The majority religion is Theravada Buddhism, practised by about 97% of the population, influencing much of the country's traditions and daily life.<sup>124</sup>

Cambodia has experienced robust economic growth over the past two decades, transforming from one of the world's least-developed countries into a lower-middle-income nation. The economy relies heavily on agriculture, garment manufacturing, tourism, and construction. Agriculture remains a vital sector, employing a significant portion of the population, with rice being the primary crop. However, industrial sectors such as garment production and footwear manufacturing have emerged as key export earners, accounting for about 70% of Cambodia's total exports.

Cambodia is endowed with natural resources, including fertile land, forest cover, freshwater resources from the Mekong River and Tonlé Sap Lake, and mineral deposits. Tonlé Sap, Southeast Asia's largest freshwater lake, plays a crucial role in Cambodia's fisheries and agriculture, supporting millions of livelihoods.

However, the country faces significant environmental challenges, including deforestation, overfishing, and the impacts of climate change. Floods, droughts, and rising temperatures increasingly threaten agricultural productivity, biodiversity, and rural livelihoods. Deforestation has accelerated due to illegal logging and land conversion for agriculture, raising concerns about long-term environmental sustainability.<sup>125</sup>

Cambodia has made considerable progress in improving health and education outcomes. Literacy rates have risen, and enrollment in primary education is nearly universal. Nevertheless, challenges remain in ensuring access to quality education, particularly in rural areas, and addressing healthcare disparities.<sup>126</sup>

### National climate

Cambodia's climate is dominated by a tropical monsoon system, characterized by distinct wet and dry seasons. The country's climate is influenced by several key factors, including the seasonal monsoon winds, the Mekong River system, its geographical location in Southeast Asia, and broader climate phenomena such as El Niño-Southern Oscillation (ENSO) events.

Cambodia experiences two primary seasons driven by the monsoon:

- **Wet Season (May to October):** The southwest monsoon brings heavy rainfall and high humidity as moist air from the Indian Ocean flows across the region. This period accounts for the majority of Cambodia's annual rainfall, which ranges from 1,000 to 1,500 mm in lowland areas and up to 2,000 mm in upland regions and the Cardamom Mountains.
- **Dry Season (November to April):** During the northeast monsoon, dry, cooler air from the Asian landmass results in reduced precipitation and lower humidity. Temperatures during this period are typically lower, especially in December and January, though they rise significantly in March and April.

The Mekong River plays a central role in Cambodia's climate and hydrology. Seasonal flooding of the river, particularly during the wet season, nourishes the surrounding plains and contributes to the

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<sup>124</sup> World Bank: Cambodia Economic Update (2023)

<sup>125</sup> Mekong River Commission: Environmental Challenges in the Mekong Basin (2023)

<sup>126</sup> National Institute of Statistics, Cambodia (2022)

natural irrigation of rice fields, which are critical to Cambodia's agriculture. Tonlé Sap Lake, the largest freshwater lake in Southeast Asia, undergoes significant seasonal fluctuations in size due to the monsoon rains and reverse flow from the Mekong. These changes create a unique ecosystem that supports fisheries and biodiversity but also makes the region prone to flooding.

Cambodia's climate is generally warm, with average annual temperatures ranging between 26°C and 32°C. The hottest months are typically March and April, while December and January are cooler. High humidity levels, especially during the wet season, amplify heat stress, impacting daily life and productivity.

Cambodia is affected by global climate phenomena such as El Niño-Southern Oscillation (ENSO) events. El Niño years tend to bring reduced rainfall, prolonged dry seasons, and higher temperatures, which can lead to droughts, reduced agricultural yields, and water shortages. Conversely, La Niña events can result in heavier rainfall and an increased risk of flooding, especially along the Mekong River and Tonlé Sap Lake.

In recent years, Cambodia has experienced growing climate variability and changes attributed to climate change. Average temperatures have risen, and extreme weather events, such as intense rainfall and prolonged droughts, have become more frequent. Sea level rise is a growing concern for low-lying areas near the coast, and shifts in rainfall patterns threaten agricultural stability. These changes have significant implications for Cambodia's water resources, food security, and disaster preparedness.

Cambodia's climate is also influenced by larger regional systems such as the Indian Ocean Dipole and interactions with neighbouring countries in the Mekong River Basin. Changes in upstream water use and dam construction along the Mekong in countries like Laos and Thailand affect water flow and flood regimes in Cambodia, exacerbating the challenges posed by climate variability.

### *Historical climate trends*

The climate of the country is defined by distinct regional and seasonal patterns of rainfall, with notable variability in both precipitation and drought conditions. The annual precipitation from 1980–2020 averaged approximately 1,849.52 mm, with a slight, but not statistically significant, increasing trend of 0.06% per decade. Rainfall now ranges between 1,822.24 mm and 1,913.7 mm annually. The peak rainfall occurs in the southwestern and northeastern regions, with volumes exceeding 2,000 mm annually. The wet season, which spans May to October, is concentrated in the northeast, while the dry season runs from November to April, characterized by significantly lower rainfall volumes.

Extreme rainfall events are most intense in the southwest, where monthly peak rainfall can surpass 400 mm, and single-day rainfall extremes exceed 60 mm. Similarly, the highest five-day rainfall totals and 95th percentile extreme event magnitudes are also observed in this region, alongside the highest single-day rainfall intensity. In contrast, the northeast experiences moderate extremes, with single-day peaks around 40 mm. Central and northern areas see lower rainfall intensities overall.

The annual number of wet days, defined as days with measurable precipitation, averaged 139.01 days from 1980–2020. While this has increased slightly by 0.16 days per decade, the trend is not statistically significant, with wet days now ranging between 138.07 and 141.23 days annually. The consecutive wet days are highest in the northeast and southwest, aligning with the peak rainfall patterns during the wet season. Meanwhile, consecutive dry days and longer dry spell durations are more pronounced in the northern regions, with reductions noted in the wetter southern and western areas.



Drought conditions, measured by the Standardized Precipitation-Evapotranspiration Index (SPEI), averaged 0.13 over the same period, with a small but not statistically significant decreasing trend of -0.03 per decade. This decline indicates an increase in drought frequency and severity, with SPEI values now ranging between -0.08 and 0.47. Historically, drought severity has been most acute in the northwestern and southern areas. Seasonal rainfall variance is highest in the northeast, reflecting greater year-on-year variability in this region, while aridity levels remain generally low across the country.

High evaporation rates, particularly in the northeast, contribute to increased water loss, exacerbating dryness in the drier months. These factors combined—higher rainfall variability, intense wet periods in some regions, and prolonged dry spells in others—underscore the complex interplay of climatic influences across the country.

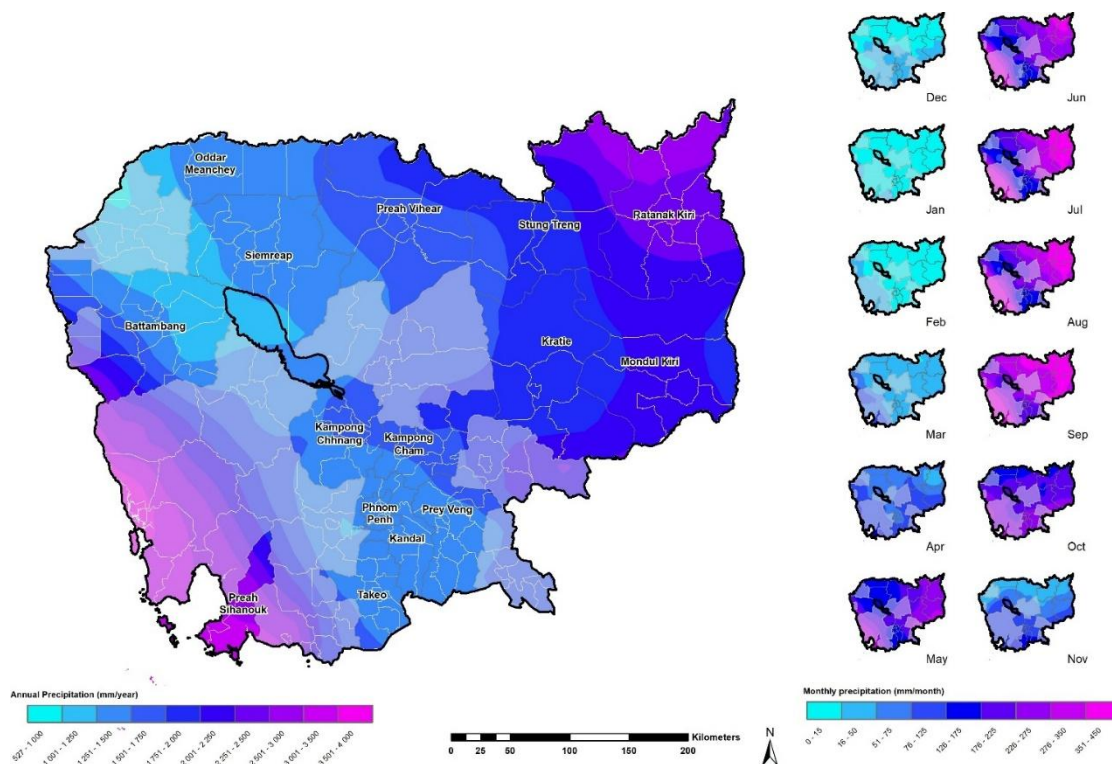
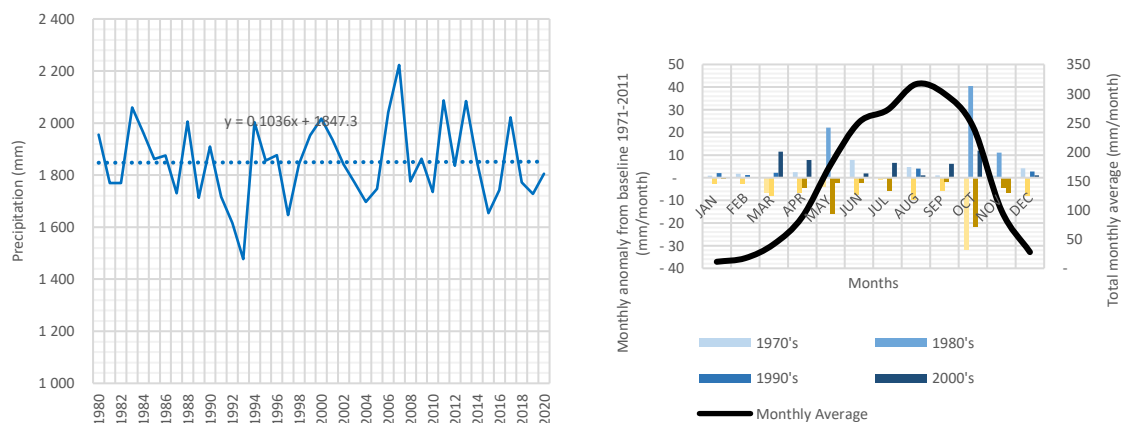


Figure 2-1: Current rainfall volume distribution. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)



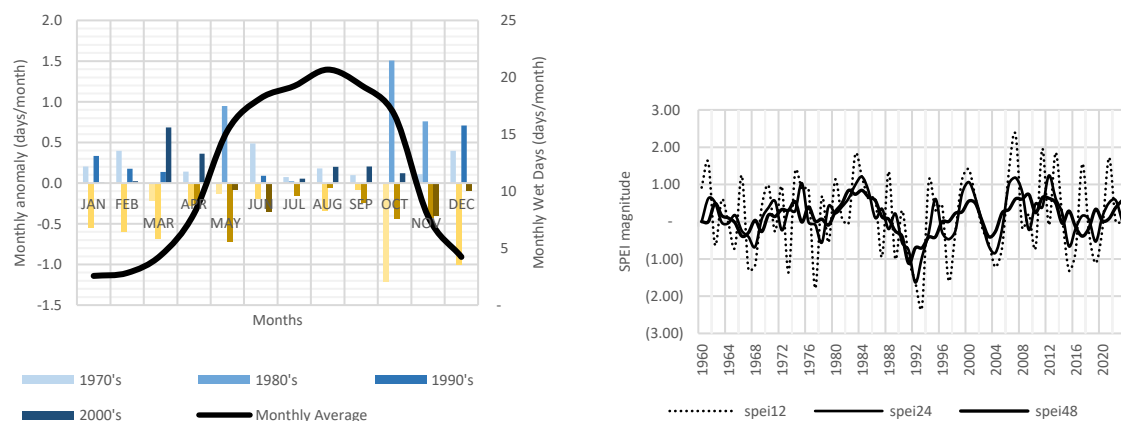


Figure 2-2. Longitudinal change in rainfall parameters from 1980-2020. Annual rainfall (top left), number of wet days (top centre), drought intensity (top right), monthly changes in rainfall (bottom left), and monthly changes in wet days (bottom right)

Table 2-1. Change in rainfall from 1980-2020

|                           | Precipitation (mm)            | Wet days                      | SPEI                          |
|---------------------------|-------------------------------|-------------------------------|-------------------------------|
| Mean 1980-2020            | 1 849.52                      | 139.01                        | 0.13                          |
| 95% confidence interval   | 1822.24 - 1913.7mm            | 138.07 - 141.23 days          | -0.08 - 0.47                  |
| Trend                     | Not Statistically Significant | Not Statistically Significant | Not Statistically Significant |
| Trend (change per decade) | 0.06%                         | 0.16 days                     | -0.03                         |

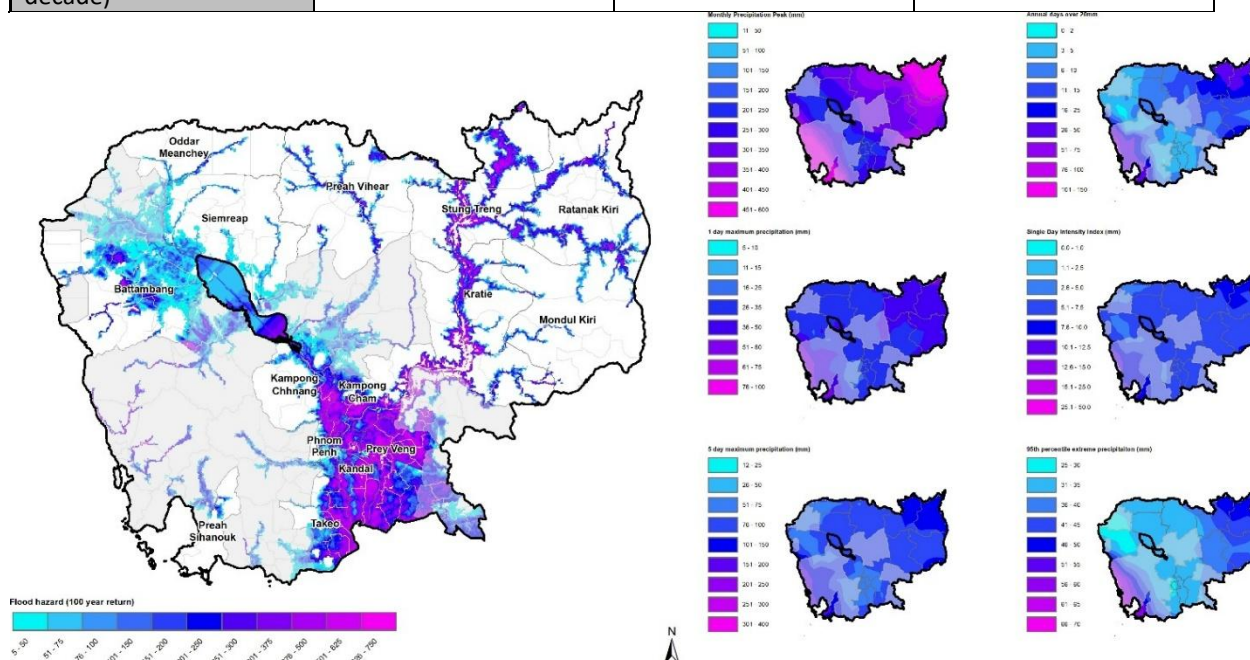


Figure 2-3: Current flooding and extreme rainfall characteristics. Flood areas (left), extreme rainfall characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

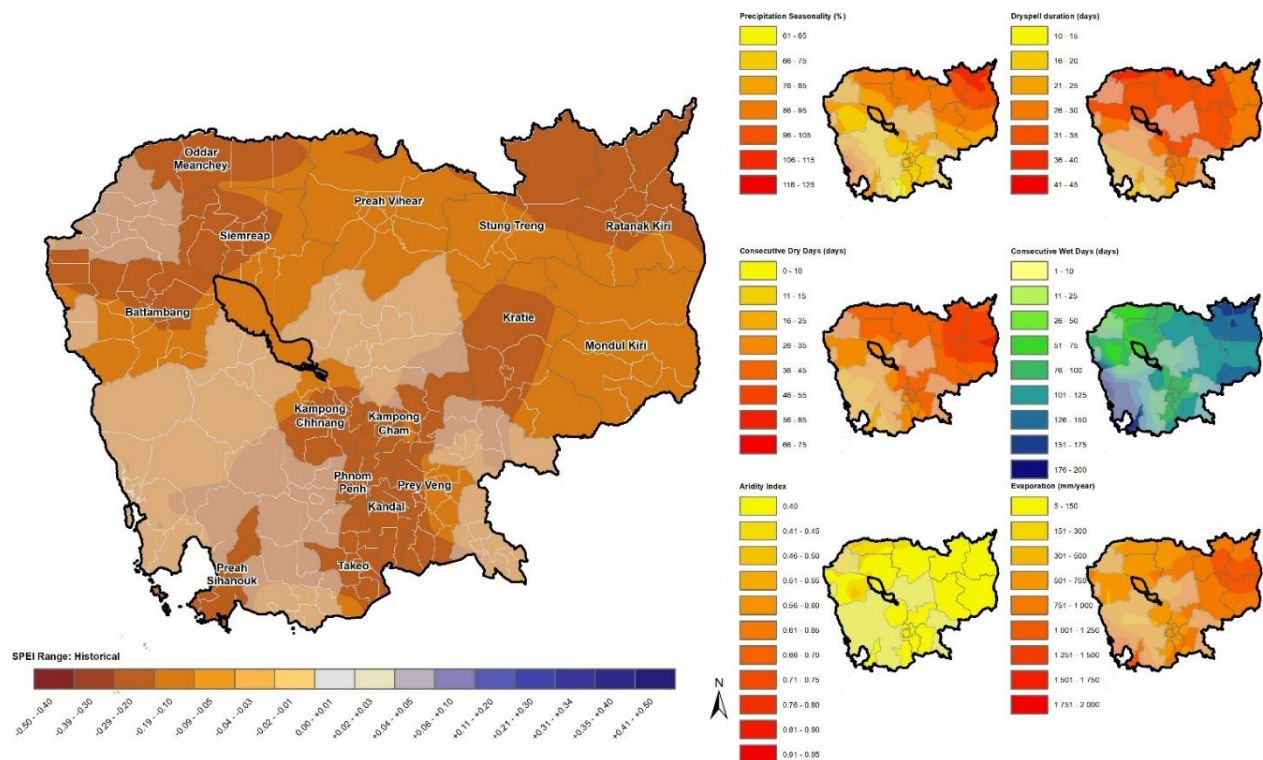


Figure 2-4: Current Drought and drying rainfall characteristics. Flood areas (left), extreme rainfall characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

Cambodia's climate has undergone significant warming trends from 1980 to 2020, with clear regional and seasonal variations. Minimum temperatures have averaged approximately 22.8°C over this period, showing a statistically significant increase of 0.22°C per decade. Mean temperatures, which averaged 27.23°C, have also risen at a statistically significant rate of 0.19°C per decade, while maximum temperatures, averaging 31.72°C, have increased by 0.16°C per decade. These trends reflect the broader impacts of climate change on the region, with rising temperatures posing challenges for both ecosystems and communities.

The hottest period occurs from March to June, with average maximum temperatures exceeding 32°C across much of the country. During this time, central Cambodia, particularly the northwest, experiences the highest temperatures, with monthly peaks ranging from 34°C to 38°C. By contrast, the eastern and western regions see slightly lower peak temperatures of around 30°C, while the southwest remains the coolest area, with peaks between 33°C and 35°C. In the cooler months from September to December, average maximum temperatures drop to around 28°C, offering seasonal relief.

The duration of warm spells is longest in the northwest, where extended periods of elevated temperatures are most pronounced. This region also experiences the greatest number of days with temperatures exceeding 35°C, averaging approximately 70 days annually. Central and eastern areas see about 40 days annually above this threshold, while the southwest records the lowest frequency of such events. Single-day extreme temperatures provide further evidence of regional variability, with most areas experiencing peaks between 39°C and 42°C, while the southwest continues to exhibit lower extremes of 33°C to 35°C.

These temperature patterns have significant implications for Cambodia. Prolonged and intense heat periods increase the risk of heat-related illnesses, particularly for vulnerable populations such as children, the elderly, and outdoor workers. Higher temperatures can also reduce agricultural



productivity, increase evapotranspiration, and strain water resources. Additionally, infrastructure, including roadways and power systems, may face accelerated wear and increased demand for cooling.

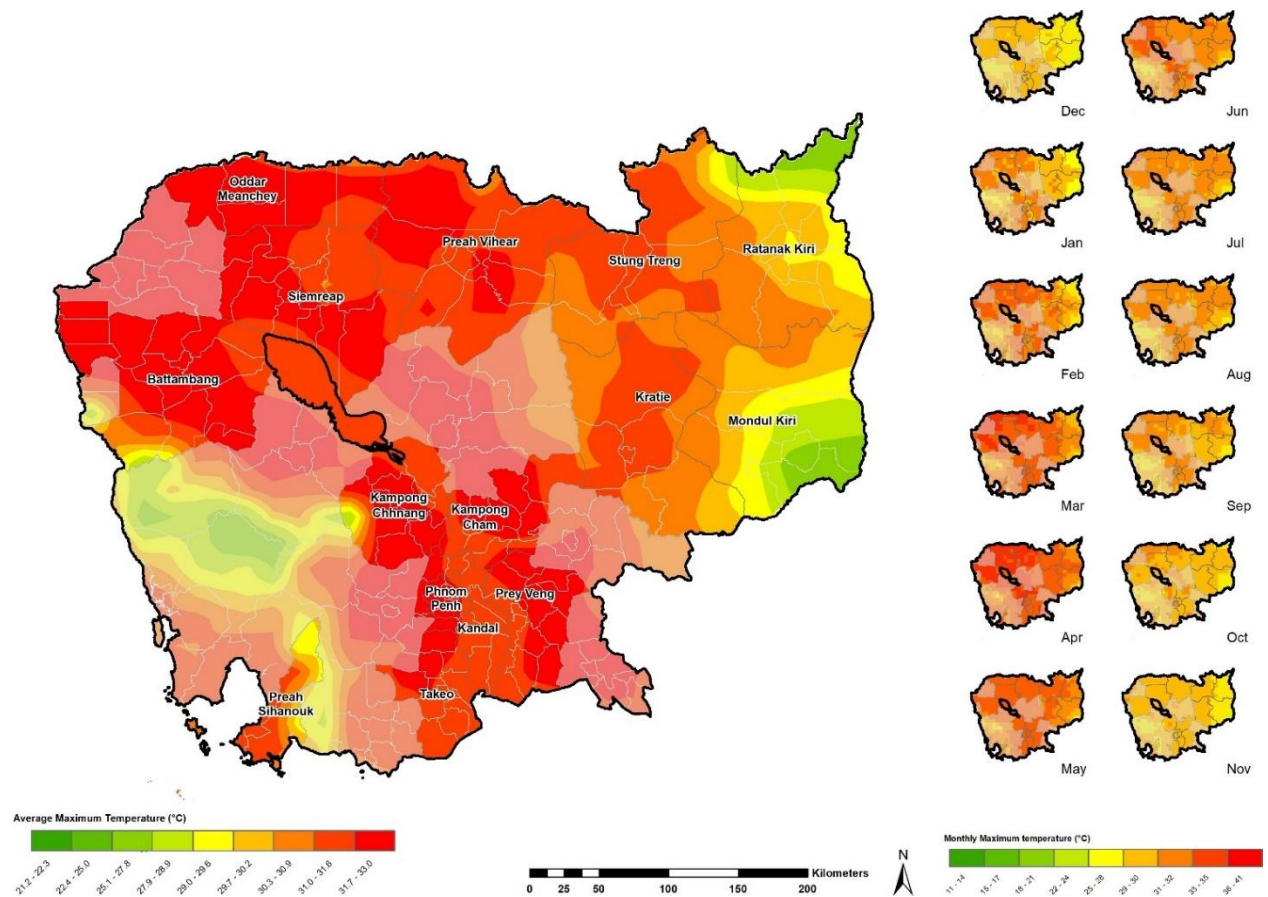


Figure 2-5: Current temperature distribution. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

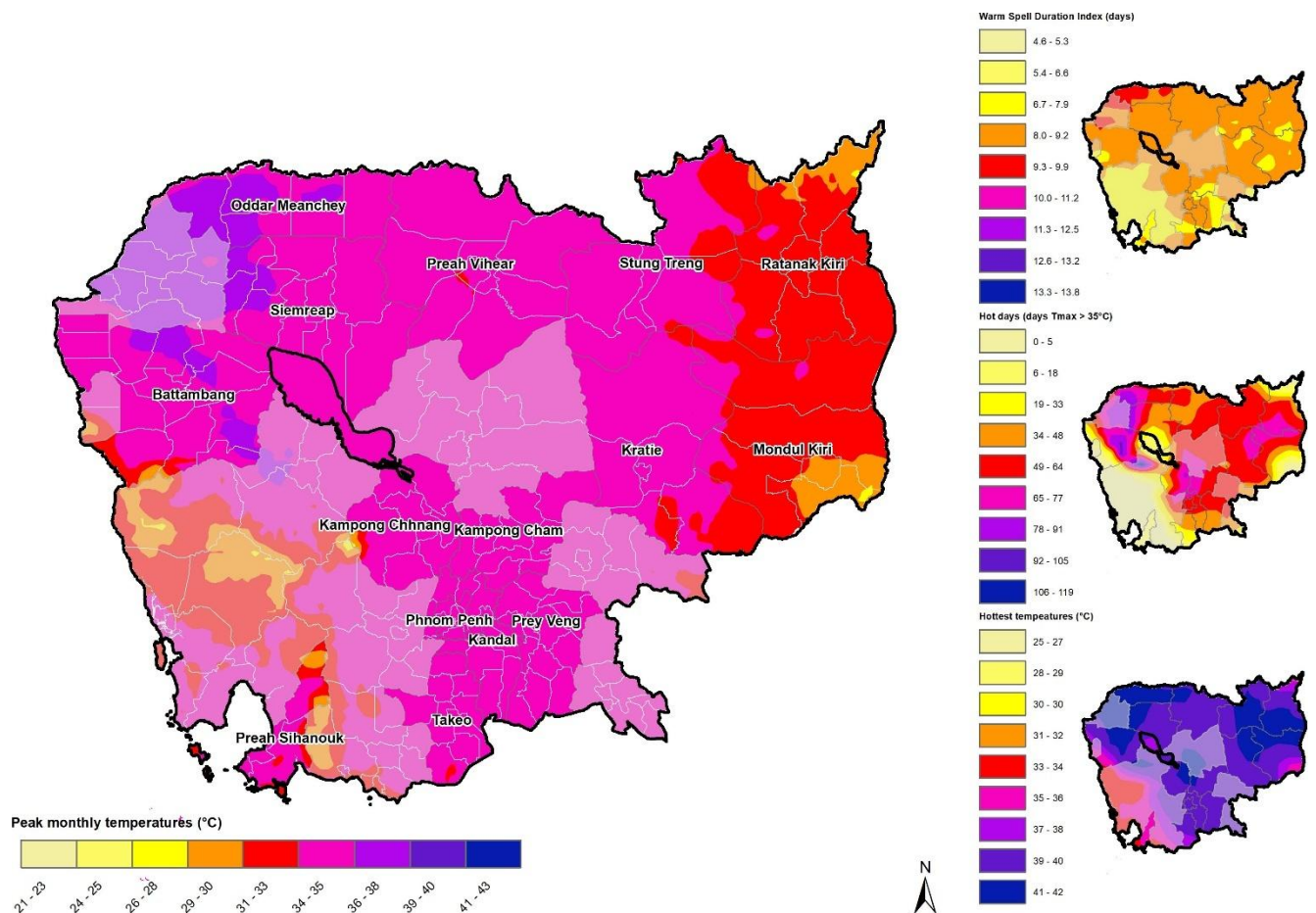


Figure 2-6: Current heatwave and extreme temperature characteristics. Peak monthly temperatures (left), extreme temperature characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

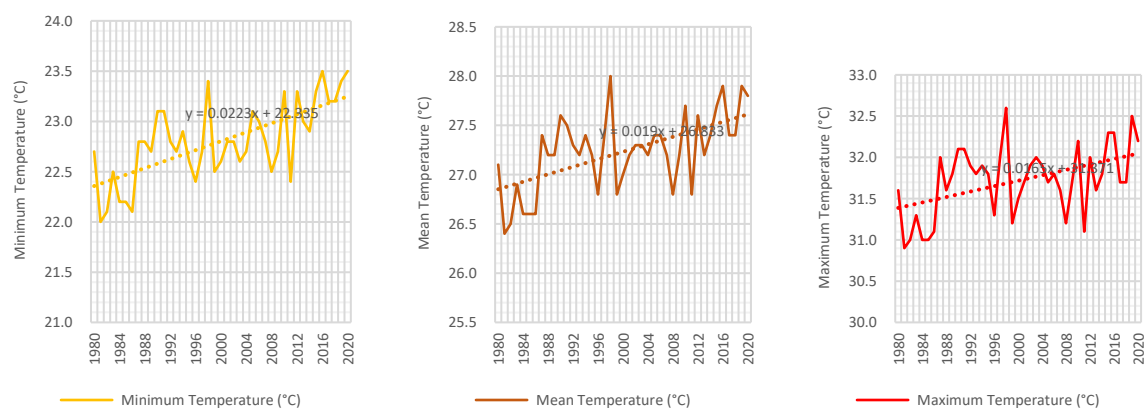


Figure 2-7. Longitudinal change in temperatures from 1980-2020. Minimum (left), Mean (centre), Maximum (right) temperatures

*Table 2-2. Change in temperatures from 1980-2020*

|                           | Minimum<br>Temperature (°C)  | Mean Temperature<br>(°C)     | Maximum<br>Temperature (°C)  |
|---------------------------|------------------------------|------------------------------|------------------------------|
| Mean 1980-2020            | <b>22.80</b>                 | <b>27.23</b>                 | <b>31.72</b>                 |
| 95% confidence interval   | <b>22.86 - 23.1°C</b>        | <b>27.25 - 27.49°C</b>       | <b>31.7 - 31.96°C</b>        |
| Trend                     | Statistically<br>Significant | Statistically<br>Significant | Statistically<br>Significant |
| Trend (change per decade) | <b>0.22°C</b>                | <b>0.19°C</b>                | <b>0.16°C</b>                |

### *Projected climate trends*

Cambodia's future climate under the SSP2-4.5 scenario (2020–2050) projects significant changes in rainfall patterns, with spatial and temporal variations that could have critical implications for water management, agriculture, infrastructure, and disaster preparedness. Annual rainfall is expected to average 1,791.78 mm, with a statistically significant increasing trend of 1% per decade, leading to totals ranging between 1,813.73 mm and 1,843.57 mm by mid-century. However, this overall increase masks notable regional differences, with central areas projected to receive an additional 10–25 mm annually, while parts of the far northeast, southeast, and northwest could see declines of up to 25 mm.

Seasonally, the months from July to October are expected to see rainfall increases across much of the country, particularly in the northeast. Conversely, the months leading up to this period, including April and May, are projected to experience reduced rainfall of up to 5 mm per month, potentially affecting crop planting and water availability at critical times.

Extreme rainfall events are expected to intensify. The peak one-day maximum rainfall is projected to average 37.86 mm, with a modest but not statistically significant increase of 0.56 mm per decade. These changes are concentrated in the southwest and some northeastern areas, while other regions may experience slight decreases. The peak five-day maximum rainfall is expected to rise significantly, increasing by 2.25 mm per decade to reach values between 114.02 mm and 116.58 mm, with the largest increases in the north and southwest. Similarly, the peak one-month maximum rainfall is projected to increase significantly by 6.5 mm per decade, with totals reaching 360.46 mm to 367.9 mm, primarily in northern and southern regions.

The frequency of heavy rainfall days is also expected to rise. Annual days with rainfall exceeding 20 mm are projected to increase by 0.44 days per decade, averaging 10.95 days and ranging between 11.69 and 12.16 days, with the eastern areas experiencing the most notable increases. Days with rainfall above 50 mm, although rare, are expected to increase slightly, with a statistically significant rise of 0.02 days per decade, reaching up to 0.24–0.26 days annually. These increases in extreme rainfall contribute to a heightened risk of flooding, with 1:100-year flood anomalies expected to become more widespread, particularly in southern areas and isolated parts of the northeast.

Dry and wet spell dynamics are also projected to shift. Consecutive wet days are expected to decrease slightly, with a not statistically significant decline of 0.71 days per decade, averaging 104.38 days and ranging between 101.57 and 104.72 days. Similarly, consecutive dry days are projected to decrease marginally, averaging 38.31 days annually, with no statistically significant trend. These shifts suggest a slightly more balanced distribution of wet and dry periods.

The drought index (SPEI) is projected to improve, with a statistically significant increase of 0.08 per decade, indicating fewer and less severe drought events overall. SPEI values are expected to range

between 0.07 and 0.17, though regional variability persists. The northwest may experience increased drought severity, while the northeast sees moderate increases and central and southern areas experience only minor changes. Rainfall seasonality is projected to increase, indicating greater year-on-year variability, particularly in the south and northwest. Aridity and evaporation are also expected to rise in the northwest, while southern and eastern areas may experience slight decreases in evaporation.

These projected changes highlight the growing challenges and opportunities for Cambodia's climate resilience. While increased rainfall may benefit water resources and agriculture in some areas, heightened variability, extreme rainfall events, and flood risks necessitate investments in adaptive infrastructure, flood management systems, and sustainable water use strategies. Such measures will be critical for mitigating the impacts on livelihoods, ecosystems, and development in the coming decades.

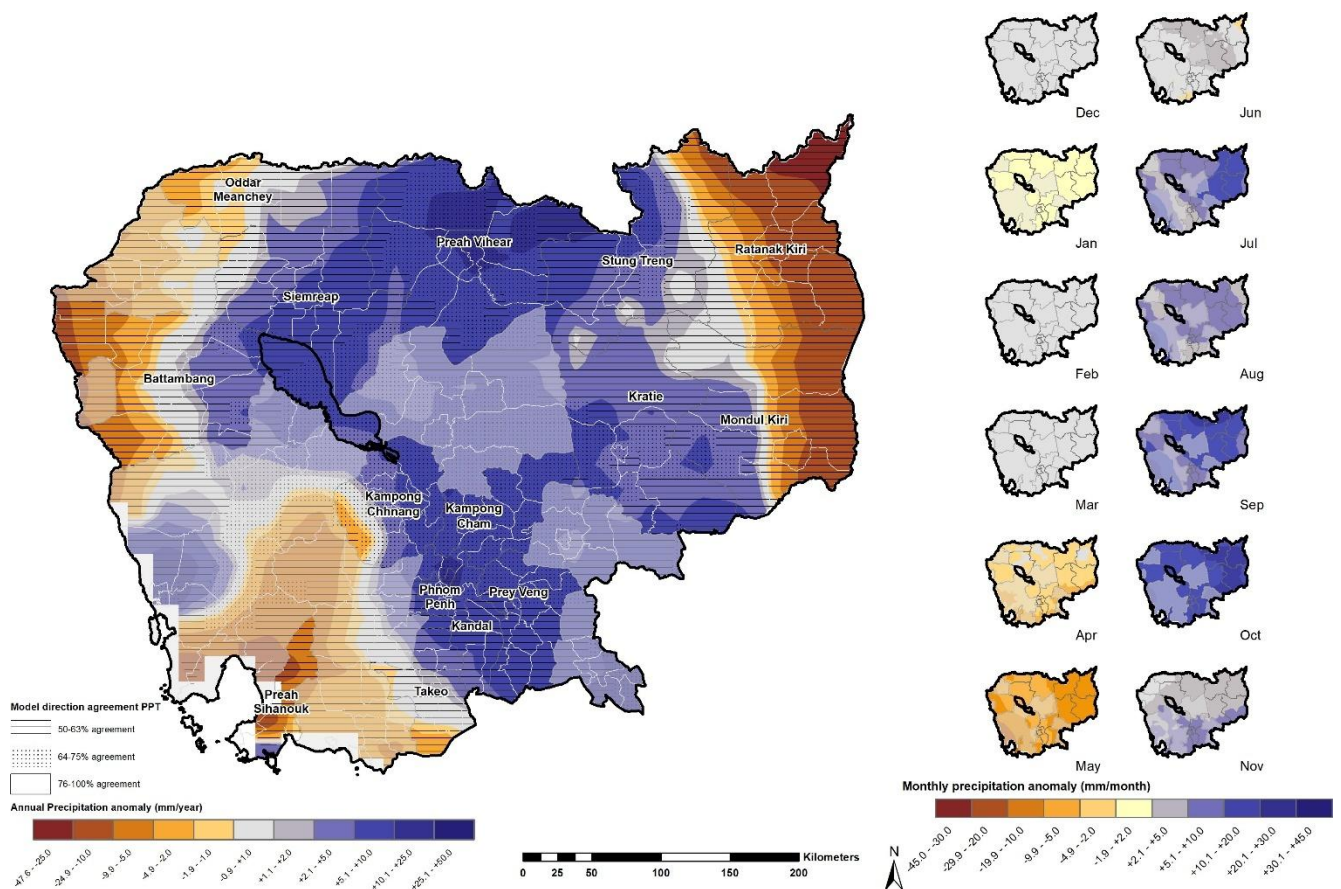


Figure 2-8: Projected rainfall volume distribution anomaly. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)



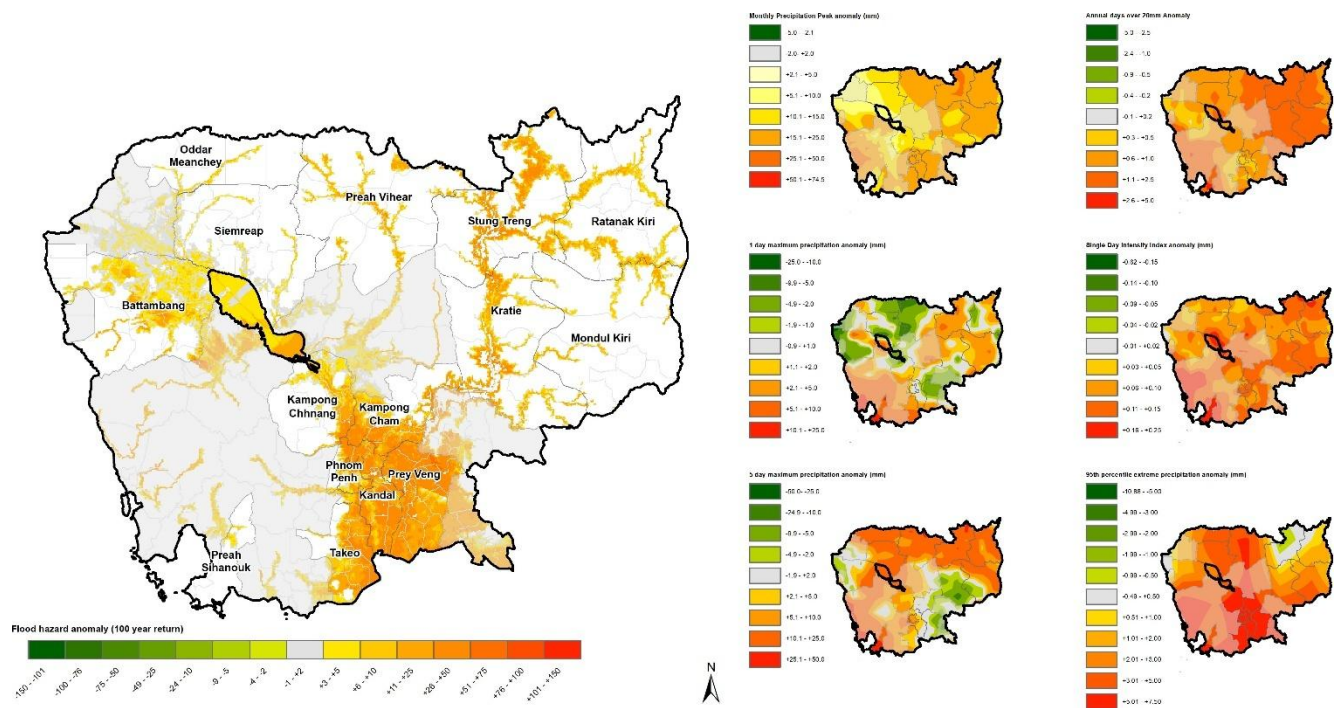


Figure 2-9: Projected flooding and extreme rainfall characteristics. Flood areas (left), extreme rainfall anomaly characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

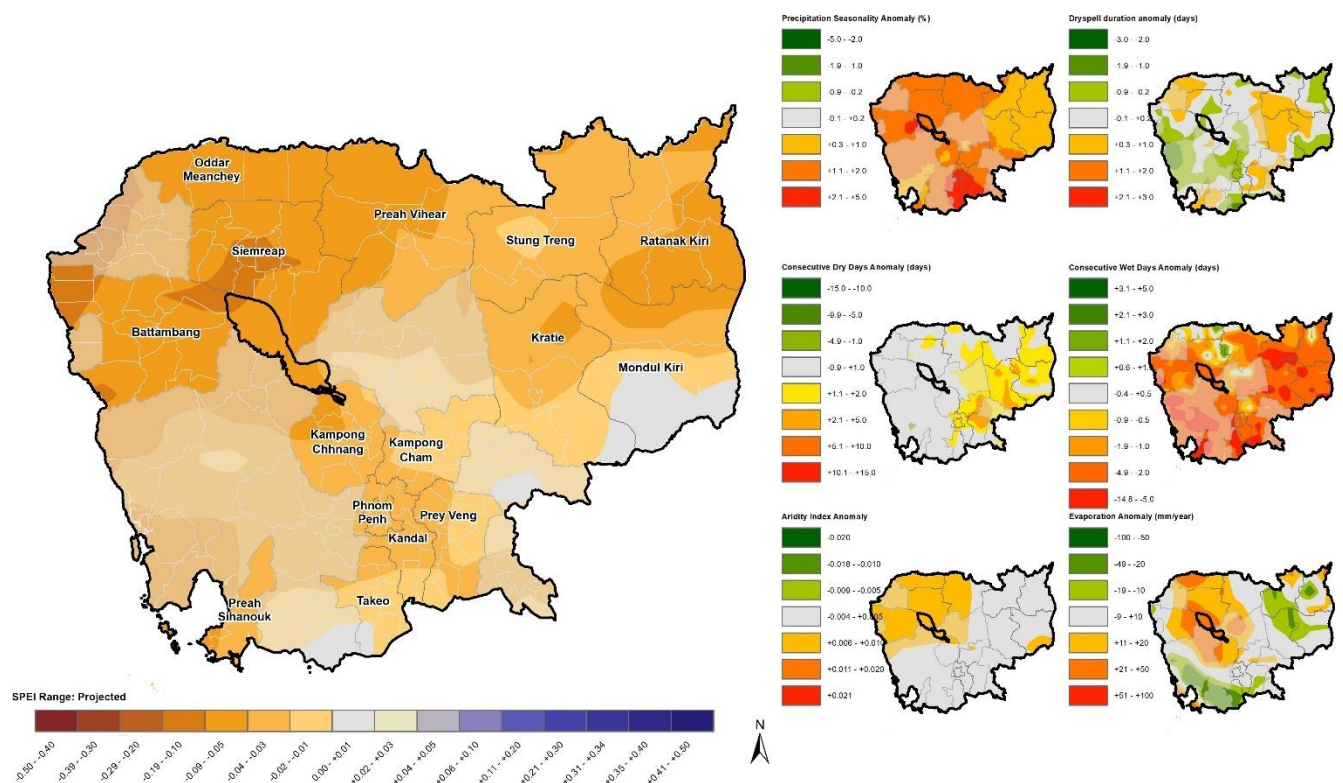
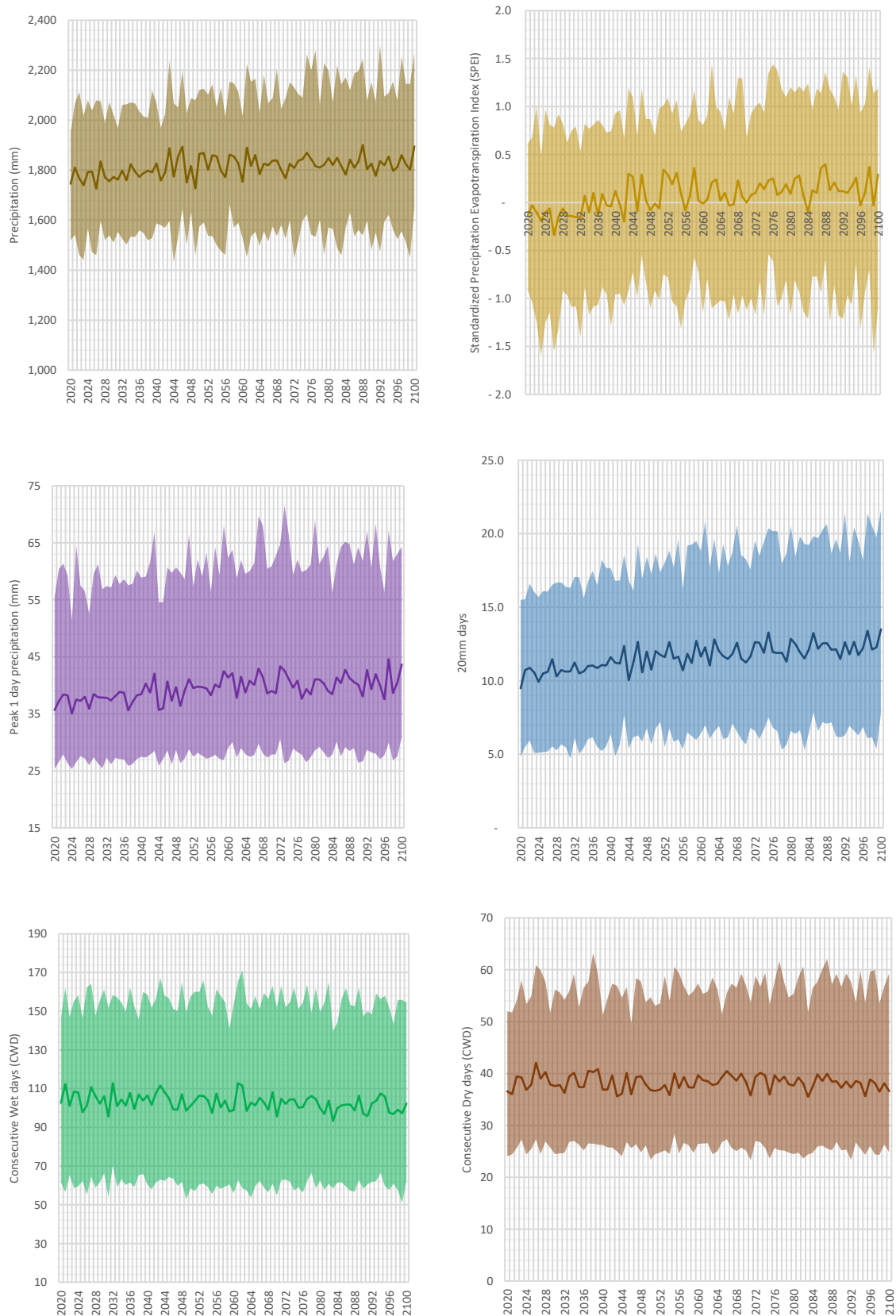


Figure 2-10: Projected Drought and drying rainfall characteristics. Flood areas (left), extreme rainfall characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)





*Figure 2-11. Longitudinal change in rainfall parameters from 2020-2100 (SSP2-45). Annual rainfall (top left), SPEI index (top right), Peak 1-day rainfall (middle left), 20mm days (middle right), consecutive wet days (bottom left), and consecutive dry days (bottom right)*

Table 2-3. Projected change in rainfall from 1980-2020

|                           | Precipitation        | 1-Day max rainfall | 5-Day max rainfall | 1-Month max rainfall | days above 20mm of rainfall | days above 50mm of rainfall | Consecutive Wet Days | Consecutive Dry Days | Drought index |
|---------------------------|----------------------|--------------------|--------------------|----------------------|-----------------------------|-----------------------------|----------------------|----------------------|---------------|
| Mean 2020-2050            | 1 792                | 37.9               | 110.1              | 355.6                | 11.0                        | 0.2                         | 104.4                | 38.3                 | - 0.0         |
| 95% confidence interval   | 1813.73 - 1843.57m m | 39.65 - 40.74m m   | 114.02 - 116.58m m | 360.46 - 367.9m m    | 11.69 - 12.16 days          | 0.24 - 0.26 days            | 101.57 - 104.72 days | 37.73 - 38.93 days   | 0.07 - 0.17   |
| Statistical Trend         | Significant          | Not Significant    | Significant        | Significant          | Significant                 | Significant                 | Not Significant      | Not Significant      | Significant   |
| Trend (change per decade) | 0                    | 0.56mm             | 2.25mm             | 6.5mm                | 0.44 days                   | 0.02 days                   | -0.71 days           | -0.11 days           | 0.08          |

Under the SSP2-4.5 climate scenario, Cambodia is projected to experience significant warming from 2020 to 2050, with increases across all temperature metrics and notable spatial and seasonal variability. Minimum temperatures are projected to average 24.51°C, with a statistically significant increase of 0.28°C per decade. Mean temperatures are expected to reach 28.56°C, rising by 0.27°C per decade, while maximum temperatures are projected to average 32.62°C, with a similar statistically significant upward trend of 0.27°C per decade.

Temperature anomalies are expected to be most pronounced in the northeast, with increases of +1.15°C compared to historical averages. Central regions will see moderate increases of +1.2°C to +1.4°C, while the southwest will experience smaller rises of approximately +1.0°C. These warming trends are especially marked during the pre-monsoon months of April to June, with May experiencing the highest anomalies of up to +1.5°C.

Extreme temperature events will become more frequent and severe. The lowest minimum temperature is projected to rise from 17.48°C, with an increase of 0.26°C per decade, reaching between 18.25°C and 18.46°C. The highest maximum temperature is expected to rise from 38°C, with a statistically significant increase of 0.33°C per decade, reaching 38.68°C to 38.92°C. These peak temperatures are concentrated in inland, central, and northwestern areas, with anomalies of approximately +1.4°C on the hottest single days.

The number of hot days is projected to rise dramatically. Days above 25°C will dominate the year, averaging 364.39 days annually and increasing slightly by 0.17 days per decade. Days exceeding 30°C are projected to increase significantly, averaging 308.91 days annually and rising by 8.14 days per decade to reach up to 331.56 days. The number of days above 35°C is expected to increase substantially, from 67.32 days to between 90.86 and 97.51 days annually, particularly in central, inland, and northwestern areas, where anomalies could reach +28 days annually. The frequency of days exceeding 40°C, although still rare, is projected to rise from 0.11 days to approximately 0.86–0.95 days annually.

Monthly temperature anomalies will be most pronounced in northeastern areas, such as Ratanak Kiri, with increases of +1.6°C. Central regions will see moderate anomalies of +1.2°C to +1.4°C, while the southwest will experience more modest changes of around +1.0°C.

These temperature changes have critical implications for Cambodia's development. Higher baseline and peak temperatures will intensify heat stress for both human populations and ecosystems. Vulnerable groups, including children, the elderly, and outdoor workers, will face increased risks of heat-related illnesses. Agriculture, particularly crops sensitive to high temperatures such as rice, may experience reduced yields due to prolonged heat and higher evapotranspiration rates. Infrastructure, including roads and buildings, will face accelerated wear and rising energy demands for cooling, particularly during peak heat months.

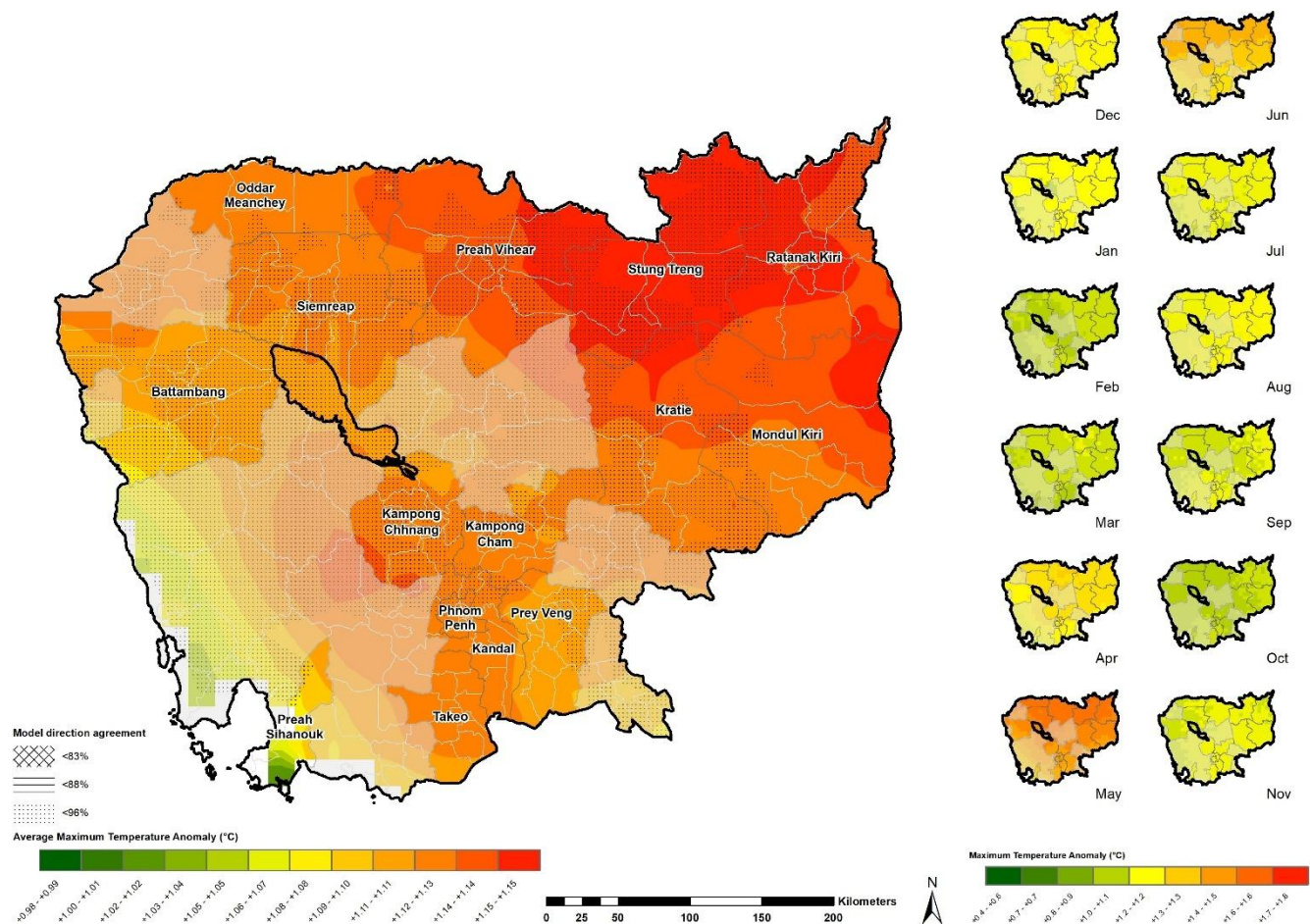


Figure 2-12: Projected Temperature distribution anomaly. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

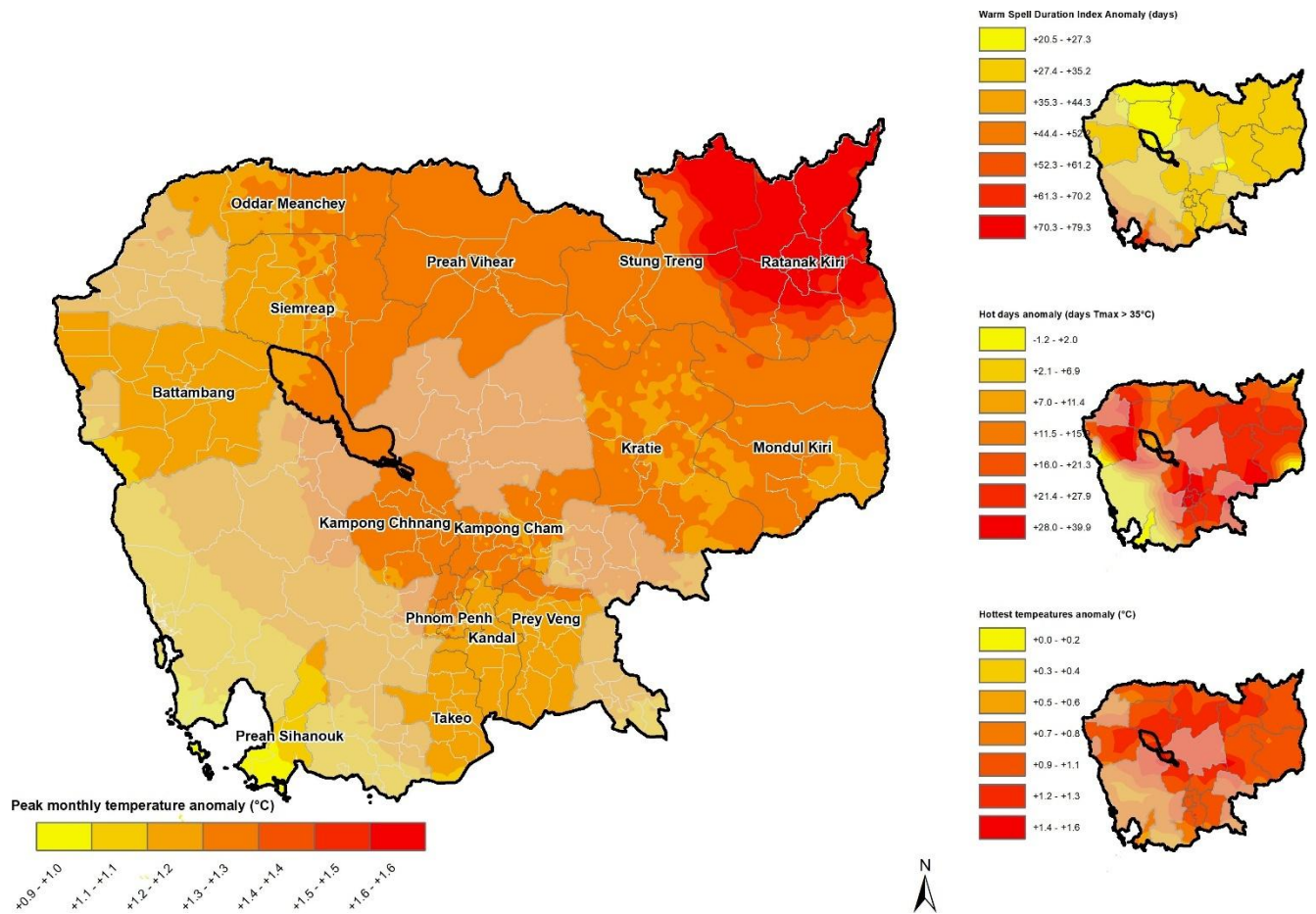


Figure 2-13: Projected heatwave and extreme temperature characteristics. Peak monthly temperatures (left), extreme temperature characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

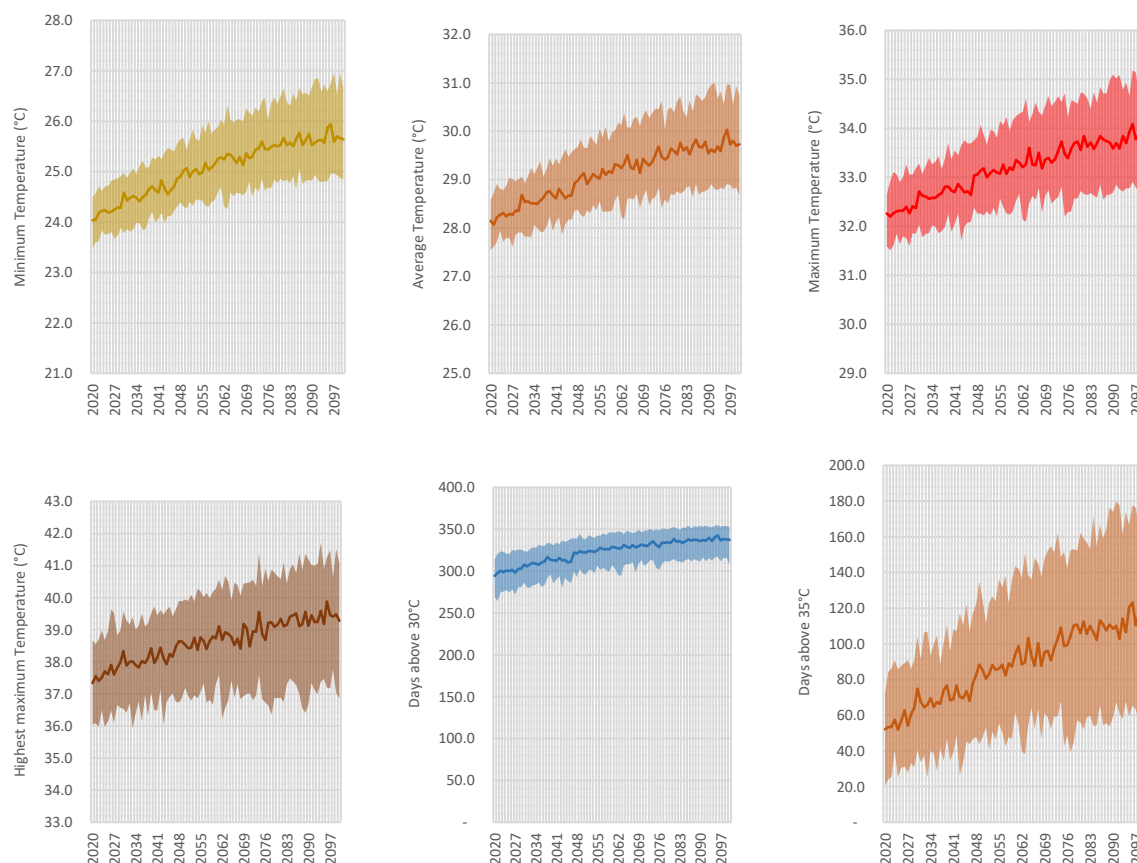


Figure 2-14. Longitudinal change in temperatures from 2020-2100 (SSP2-45). Minimum (top left), Mean (top centre), Maximum (top right) temperatures, Peak maximum temperature (bottom right), days above 30 °C (bottom middle), and the days above 35 °C (bottom right)

Table 2-4. Projected change in temperatures from 2020-2050

|                           | Minimum Temperature | Mean Temperature | Maximum Temperature | Lowest Minimum Temperature | Highest maximum Temperature | Days above 25°C      | Days above 30°C      | Days above 35°C    | Days above 40°C  |
|---------------------------|---------------------|------------------|---------------------|----------------------------|-----------------------------|----------------------|----------------------|--------------------|------------------|
| Mean 2020-2050            | 24.5                | 28.6             | 32.6                | 17.5                       | 38.0                        | 364.4                | 308.9                | 67.3               | 0.1              |
| 95% confidence interval   | 25.17 - 25.35°C     | 29.21 - 29.39°C  | 33.24 - 33.43°C     | 18.25 - 18.46°C            | 38.68 - 38.92°C             | 364.67 - 364.81 days | 326.11 - 331.56 days | 90.86 - 97.51 days | 0.86 - 0.95 days |
| Statistical Trend         | Significant         | Significant      | Significant         | Significant                | Significant                 | Significant          | Significant          | Significant        | Significant      |
| Trend (change per decade) | 0.28°C              | 0.27°C           | 0.27°C              | 0.26°C                     | 0.33°C                      | 0.17 days            | 8.14 days            | 9.32 days          | 0.1 days         |

### Focus area climate changes

The following presents the detailed climate changes in each of the focus areas.

Preah Sihanouk and Ratanak Kiri have the highest increases in rainfall trends, with projected changes of over 13 mm/decade and 8.84 mm/decade, respectively, while Takeo and Battambang see relatively modest increases around 6-7 mm/decade. Coastal regions like Preah Sihanouk experience more



intense rainfall events compared to central provinces like Kampong Cham and Takeo. All provinces are experiencing similar warming trends of 0.2–0.23°C/decade, with coastal areas such as Preah Sihanouk having slightly lower average maximum temperatures (31°C) compared to inland provinces like Oddar Meanchey and Battambang (33°C). Provinces like Stung Treng and Kratie show significant improvements in drought conditions, while relative humidity declines are common nationwide, particularly in Takeo and Phnom Penh, with reductions of up to 0.2 %/decade. Hot days above 35°C increase notably in provinces like Prey Veng and Oddar Meanchey, with projections exceeding 70-80 days annually by 2050. Siem Reap and Battambang show significant increases in warm spell durations, reaching over 50 days annually.

### **Impact on School-Age Children's**

- Rising temperatures and extended warm spells are likely to increase cases of heat exhaustion, dehydration, and heat stroke among children. Provinces with pronounced increases in hot days, such as Prey Veng, Siem Reap, and Takeo, may face heightened risks.
- Tropical nights (nights above 20°C) in provinces like Kampong Cham and Phnom Penh can disrupt sleep patterns, affecting children's concentration and learning.
- Increased rainfall and flooding in provinces like Preah Sihanouk and Kratie raise risks of waterborne diseases such as diarrhoea, cholera, and dengue fever, which disproportionately affect children due to weaker immune systems.
- Decreasing relative humidity across most provinces, combined with increased heat, could exacerbate respiratory illnesses like asthma and bronchitis.
- Provinces like Stung Treng, Ratanak Kiri, and Preah Sihanouk, with significant increases in extreme rainfall, face risks of school closures and infrastructure damage due to flooding. Poor drainage systems may lead to waterlogging, impacting accessibility to schools.
- Prolonged warm spells in provinces like Battambang and Oddar Meanchey necessitate heat-resistant infrastructure. Overheated classrooms can lower student performance and attendance.
- Although droughts may decrease in intensity, water scarcity during dry seasons in Takeo and Kampong Cham could affect water availability for hygiene, sanitation, and school gardens.
- Increased electricity demand for cooling systems in urban areas like Phnom Penh may burden schools without adequate budgets, leaving students exposed to uncomfortable and unhealthy learning environments.

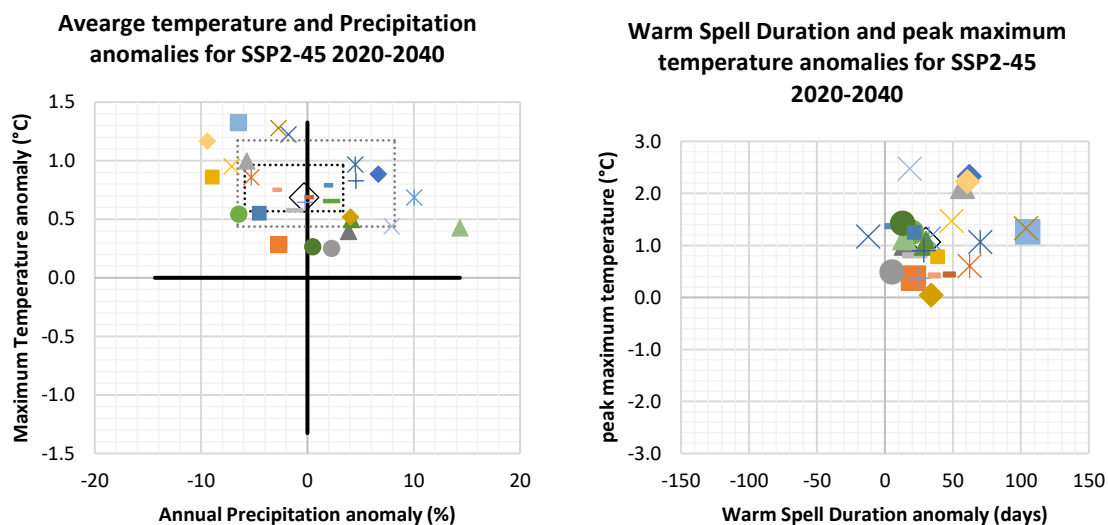
### ***Battambang***

In Battambang, mean annual rainfall is projected to increase at a statistically significant rate of 0.5% per decade, equivalent to 5.2 mm/decade. From 2015 to 2035, average annual rainfall is expected to be around 1,047 mm, with a 95% confidence range of 1,035.54 to 1,058.17 mm. The frequency of days with over 20 mm of rainfall is also expected to increase significantly, with a 95% confidence range of 1.38 to 1.72 days annually. While there is no projected increase in days with rainfall exceeding 50 mm, other extreme rainfall metrics indicate statistically significant increases. For instance, the single-day peak rainfall magnitude is projected to range between 24.36 and 26.05 mm, and the five-day peak rainfall magnitude is expected to range between 68.66 and 72.02 mm. Similarly, peak monthly rainfall is anticipated to rise, with a 95% confidence range of 209.55 to 217.99 mm.

Projections indicate a statistically significant improvement in Battambang's drought index, suggesting a reduction in severe droughts, with a 95% confidence range of -0.17 to -0.02. Consecutive dry days show a slight, non-significant increase, ranging between 33.7 and 35.86 days, while consecutive wet days may decrease slightly, also without statistical significance, with a range of 57.63 to 61.64 days. Relative humidity is expected to decline at a statistically significant rate of 0.14% per decade, with an average value of 68.36%, ranging between 68.26% and 68.45%.

Mean maximum temperatures in Battambang are projected to rise significantly by 0.2184°C per decade, with an average value of 34°C and a 95% confidence range of 33.75 to 33.91°C for the period 2015–2035. Mean temperatures are expected to increase by 0.22°C per decade, with an average of 29.38°C, while minimum temperatures follow a similar trend, with an average of 24.93°C. These temperature increases are statistically significant, highlighting the steady warming trend in the region.

Extreme heat events are becoming more pronounced in Battambang. The duration of warm spells is projected to increase significantly by 18.69 days per decade, with an average of 31.55 days, ranging between 28.01 and 35.09 days. The frequency of days above 35°C is expected to rise by 12.44 days per decade, reaching an average of 112.6 days annually, with a 95% confidence range of 109.04 to 116.15 days. Nights above 20°C will also increase significantly, with a projected trend of 1.74 nights per decade, averaging 347.86 nights annually. Peak single-day temperatures are expected to climb at a statistically significant rate of 0.26°C per decade, with a 95% confidence range of 39.1 to 39.43°C. However, days exceeding 40°C remain rare, with projections showing negligible increases for this extreme.



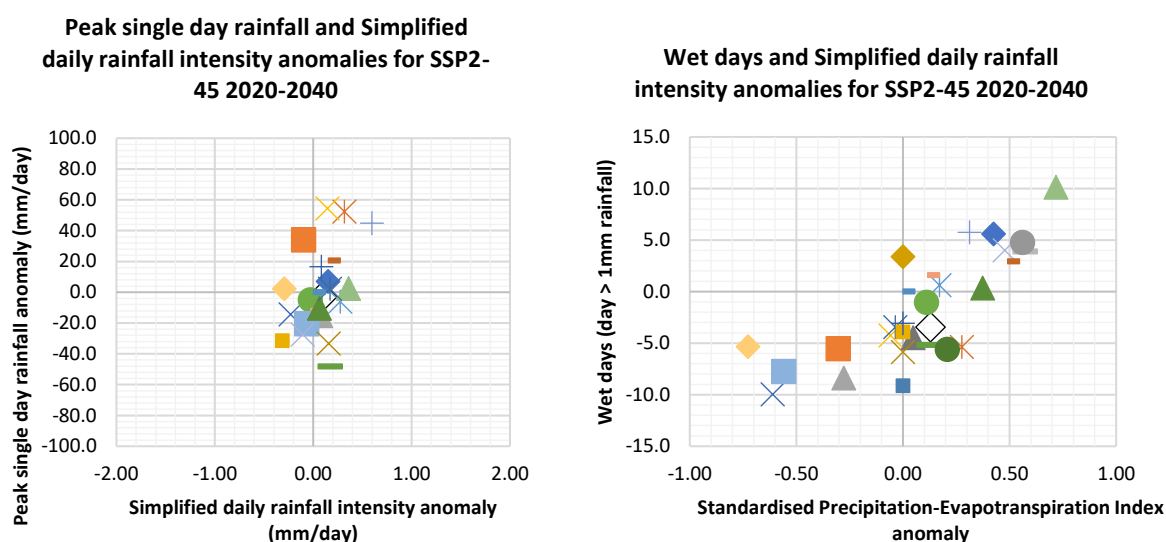


Figure 2-15. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

### Kampong Cham

Kampong Cham is projected to experience a statistically significant increase in annual rainfall, rising at a rate of 0.48% per decade (7.43 mm/decade). From 2015 to 2035, the average annual rainfall is expected to be 1,545 mm, with a 95% confidence range of 1,529.21 to 1,559.93 mm, and projections indicate it will reach approximately 1,562 mm by 2050. The number of days with rainfall exceeding 20 mm is also expected to increase significantly, with a trend of 0.21 days per decade, averaging 4.43 days annually, and a 95% confidence range of 4.27 to 4.6 days. However, no change is projected in the frequency of days with rainfall exceeding 50 mm.

Extreme rainfall metrics reveal significant increases as well. Single-day peak rainfall is projected to rise at 0.33 mm/decade, averaging 30.23 mm annually, with a 95% confidence range of 29.48 to 30.99 mm. Similarly, the five-day peak rainfall magnitude is expected to increase by 1.08 mm/decade, averaging 88.7 mm, with a confidence range of 87.06 to 90.35 mm. Peak monthly rainfall is also on the rise, with a trend of 1.99 mm/decade and an average of 305.38 mm, ranging from 301.65 to 309.11 mm.

Projections for the drought index in Kampong Cham indicate a statistically significant improvement, with a trend of 0.04 SPEI/decade and an average of -0.11, suggesting a potential reduction in severe droughts. The 95% confidence range for this index is -0.17 to -0.06. Consecutive dry days are projected to increase slightly (0.07 days/decade), averaging 35.34 days annually, but this trend is not statistically significant, with a confidence range of 34.04 to 36.64 days. Conversely, consecutive wet days are expected to decline significantly, with a trend of -0.74 days/decade, averaging 91.18 days, and a confidence range of 87.92 to 94.43 days. Relative humidity is projected to decrease significantly at a rate of -0.16% per decade, averaging 69.56%, with a confidence range of 69.38 to 69.73%.

Kampong Cham is expected to experience significant warming, with maximum temperatures increasing by 0.2114°C per decade. The average maximum temperature from 2015 to 2035 is projected to be 33°C, with a confidence range of 33.28 to 33.44°C, and future projections indicate a rise to 34°C by 2050. Mean temperatures will increase at 0.22°C per decade, averaging 29.37°C, with a 95% confidence range of 29.29 to 29.45°C, and are projected to reach 29.63°C by 2050. Minimum

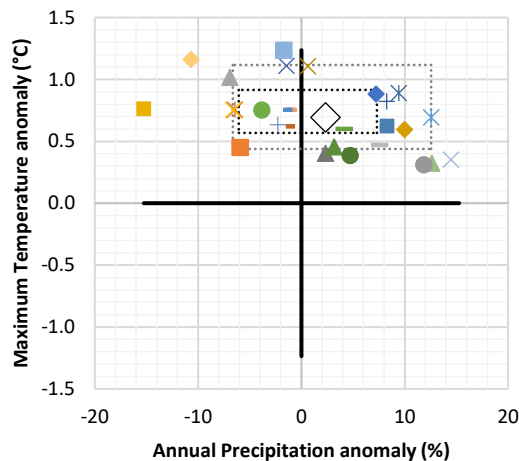


temperatures are also expected to rise at a similar rate, with an average of 25.37°C, a confidence range of 25.29 to 25.45°C, and a projected value of 25.66°C by 2050.

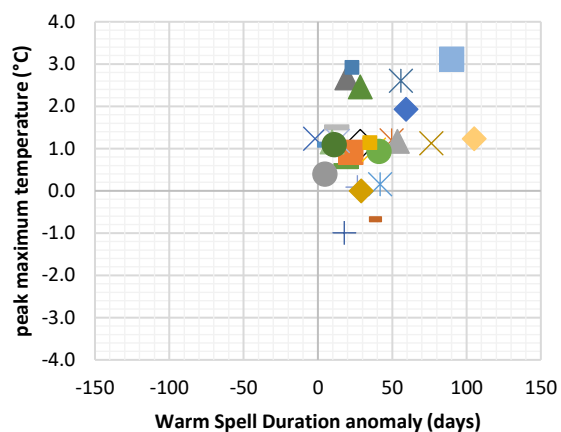
Extreme heat events are projected to intensify in Kampong Cham. The warm spell duration is expected to rise significantly, with an increase of 18 days per decade, averaging 29.62 days annually, with a confidence range of 25.82 to 33.42 days, and reaching approximately 44.58 days by 2050. The number of days exceeding 35°C is also set to increase significantly, with a trend of 11.35 days per decade, averaging 81.61 days annually, ranging from 76.61 to 86.61 days, and rising to 94.98 days by 2050. Days exceeding 40°C remain rare, with no significant change projected.

Peak daily temperatures are expected to rise at a rate of 0.27°C per decade, averaging 38.61°C, with a confidence range of 38.47 to 38.75°C, and reaching 38.93°C by 2050. Nights exceeding 20°C are projected to increase slightly by 0.67 nights per decade, averaging 359.74 nights annually, and peaking at 360.6 nights by 2050. The lowest daily temperatures will also rise, with a trend of 0.24°C per decade, averaging 18.6°C, and reaching 18.91°C by 2050.

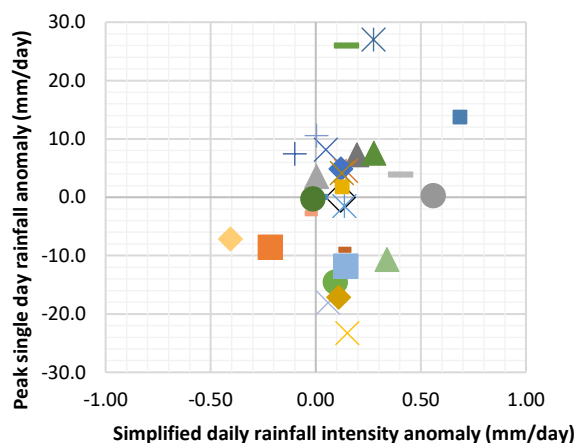
**Average temperature and Precipitation anomalies for SSP2-45 2020-2040**



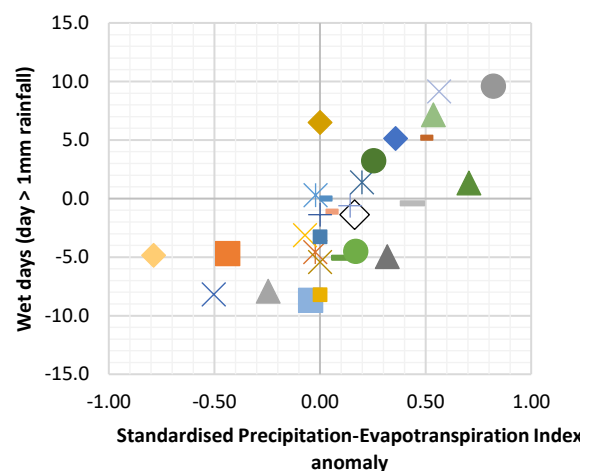
**Warm Spell Duration and peak maximum temperature anomalies for SSP2-45 2020-2040**



**Peak single day rainfall and Simplified daily rainfall intensity anomalies for SSP2-45 2020-2040**



**Wet days and Simplified daily rainfall intensity anomalies for SSP2-45 2020-2040**



*Figure 2-16. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

### *Kampong Chhnang*

Kampong Chhnang is projected to experience a statistically significant increase in annual rainfall, rising by 0.44% per decade (6.69 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 1,529 mm, with a 95% confidence range of 1,512.26 to 1,545.07 mm, and is projected to reach 1,545 mm by 2050. The number of days with rainfall exceeding 20 mm is expected to increase at a rate of 0.15 days per decade, averaging 4.08 days annually, with a confidence range of 3.83 to 4.33 days. However, no significant changes are projected for days with rainfall above 50 mm.

Extreme rainfall indicators also show upward trends. The single-day peak rainfall magnitude is expected to rise at 0.26 mm/decade, averaging 29.81 mm, with a confidence range of 29.06 to 30.55 mm. Similarly, the five-day peak rainfall magnitude will increase by 0.89 mm/decade, averaging 86.5 mm annually, with a confidence range of 84.57 to 88.43 mm. Monthly peak rainfall is projected to rise by 1.84 mm/decade, averaging 290.3 mm, with a confidence range of 285.65 to 294.95 mm.

Projections for the drought index indicate a statistically significant improvement, with a trend of 0.04 SPEI/decade and an average value of -0.12, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.17 to -0.06. Consecutive dry days are expected to decrease slightly, though not significantly, by -0.07 days per decade, averaging 32.6 days annually, with a confidence range of 31.27 to 33.92 days. Consecutive wet days, on the other hand, are projected to decline significantly by -0.94 days per decade, averaging 92.61 days, with a confidence range of 89.9 to 95.32 days. Relative humidity is expected to decrease at a statistically significant rate of -0.17% per decade, averaging 70.75%, with a confidence range of 70.6 to 70.9%, and is projected to reach 70.59% by 2050.

Kampong Chhnang will experience significant warming, with maximum temperatures projected to rise by 0.2093°C per decade. From 2015 to 2035, the mean maximum temperature is expected to average 33°C, with a confidence range of 33.05 to 33.21°C, and is projected to remain at 33°C by 2050. Mean temperatures will increase at 0.22°C per decade, averaging 29.06°C, with a confidence range of 28.98 to 29.15°C, and are projected to rise to 29.34°C by 2050. Minimum temperatures will follow a similar trend, increasing at 0.22°C per decade, averaging 25°C, with a confidence range of 24.91 to 25.08°C, and reaching 25.3°C by 2050.

Extreme heat events in Kampong Chhnang are projected to intensify. The warm spell duration is expected to increase significantly, rising by 17.75 days per decade, with an average of 29.57 days annually and a confidence range of 25.78 to 33.36 days, reaching approximately 44.56 days by 2050. Days exceeding 25°C are expected to increase slightly, averaging 364.86 days annually, with a confidence range of 364.74 to 364.98 days. The number of days exceeding 35°C is projected to rise significantly by 9.79 days per decade, averaging 79.68 days annually, with a confidence range of 75.53 to 83.83 days, and reaching 90.96 days by 2050. Days exceeding 40°C remain rare, with a negligible projected increase to 0.04 days by 2050.

Peak single-day temperatures are expected to rise at a rate of 0.26°C per decade, averaging 38.72°C annually, with a confidence range of 38.6 to 38.84°C, and reaching 39.04°C by 2050. Nights exceeding 20°C will increase at a rate of 0.98 nights per decade, averaging 356.35 nights annually, with a confidence range of 355.54 to 357.17 nights, and reaching 357.76 nights by 2050. The lowest daily temperatures will also rise, with a trend of 0.23°C per decade, averaging 18.02°C, and reaching 18.26°C by 2050.

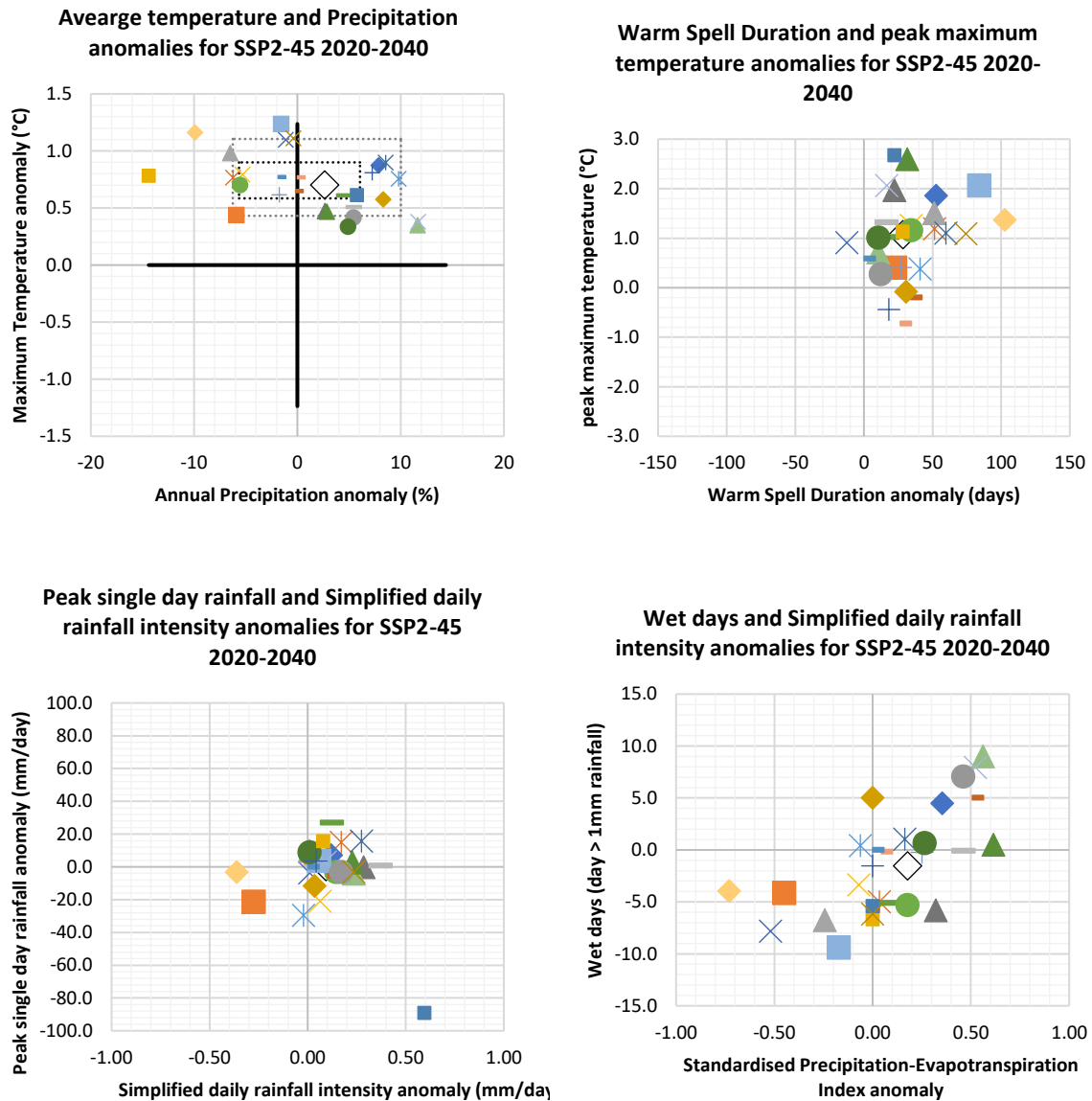


Figure 2-17. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

### Kandal

Kandal is projected to experience a statistically significant increase in annual rainfall, with a trend of 0.5% per decade (7.4 mm/decade). Between 2015 and 2035, the mean annual rainfall is expected to average 1,485 mm, with a 95% confidence range of 1,469.56 to 1,499.96 mm, and projections suggest it will reach 1,503 mm by 2050. The number of days with rainfall exceeding 20 mm is expected to rise significantly, with an increase of 0.11 days per decade, averaging 3.48 days annually, and a 95% confidence range of 3.25 to 3.71 days. No change is projected for days with rainfall exceeding 50 mm.

Extreme rainfall metrics indicate statistically significant increases. Single-day peak rainfall magnitude is expected to rise at a rate of 0.26 mm/decade, averaging 28.24 mm annually, with a confidence range of 27.46 to 29.03 mm. The five-day peak rainfall magnitude will increase by 0.78 mm/decade,

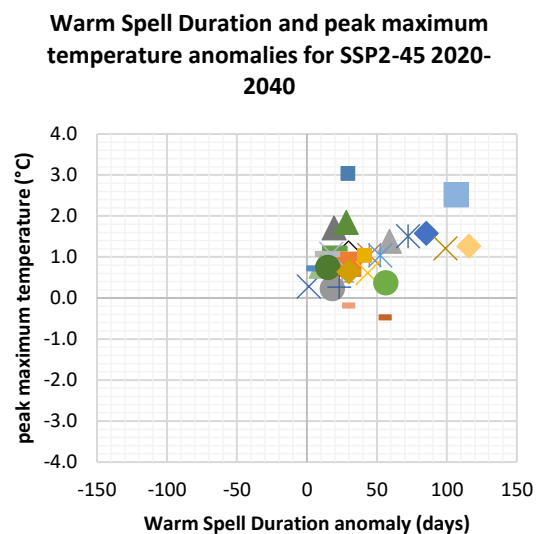
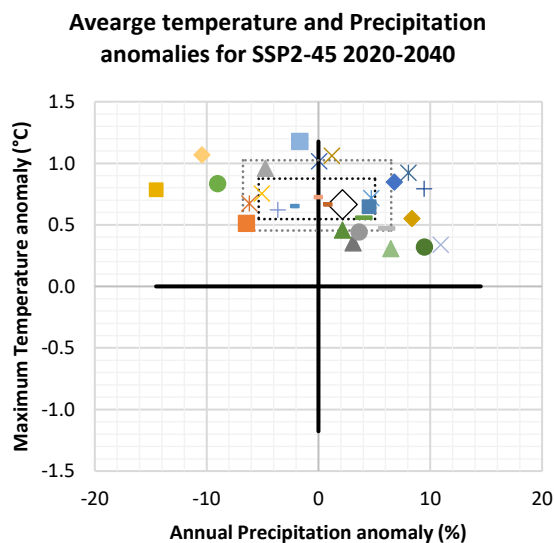
averaging 85.38 mm, with a confidence range of 83.82 to 86.94 mm. Monthly peak rainfall is projected to increase by 1.33 mm/decade, averaging 294.7 mm annually, with a confidence range of 291.1 to 298.29 mm.

The drought index in Kandal is projected to improve significantly, with a trend of 0.03 SPEI/decade and an average value of -0.1, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.17 to -0.04. Consecutive dry days are expected to decrease slightly, though not significantly, at a rate of -0.04 days per decade, averaging 32.25 days annually, with a confidence range of 30.87 to 33.64 days. However, consecutive wet days are expected to decline significantly, decreasing by -1 day per decade, with an average of 92.13 days and a confidence range of 88.63 to 95.64 days. Relative humidity is projected to decrease significantly by -0.13% per decade, averaging 71.2%, with a confidence range of 71.04 to 71.35%, and is projected to drop to 71.08% by 2050.

Kandal is projected to experience significant warming, with maximum temperatures increasing by 0.2047°C per decade. Between 2015 and 2035, the mean maximum temperature is expected to average 33°C, with a confidence range of 33.08 to 33.26°C, and remain at 33°C by 2050. Mean temperatures are projected to increase by 0.21°C per decade, averaging 29.27°C, with a confidence range of 29.18 to 29.35°C, and reaching 29.53°C by 2050. Minimum temperatures are also expected to rise by 0.21°C per decade, averaging 25.37°C, with a confidence range of 25.28 to 25.45°C, and projected to reach 25.65°C by 2050.

Extreme heat events are expected to intensify in Kandal. Warm spell durations are projected to increase significantly, rising by 20.47 days per decade, with an average of 33.71 days annually, a confidence range of 28.43 to 38.99 days, and reaching 51.11 days by 2050. The number of days exceeding 35°C is projected to increase significantly by 11.01 days per decade, averaging 63.4 days annually, with a confidence range of 58.5 to 68.3 days, and reaching 75.12 days by 2050. Days exceeding 40°C remain negligible, with no significant changes expected.

Peak daily temperatures are projected to rise at a rate of 0.26°C per decade, averaging 37.79°C, with a confidence range of 37.66 to 37.93°C, and reaching 38.09°C by 2050. Nights exceeding 20°C will increase by 0.49 nights per decade, averaging 361.87 nights annually, with a confidence range of 361.44 to 362.29 nights, and reaching 362.48 nights by 2050. The lowest daily temperatures will rise at a rate of 0.23°C per decade, averaging 19.37°C, and are projected to reach 19.62°C by 2050.



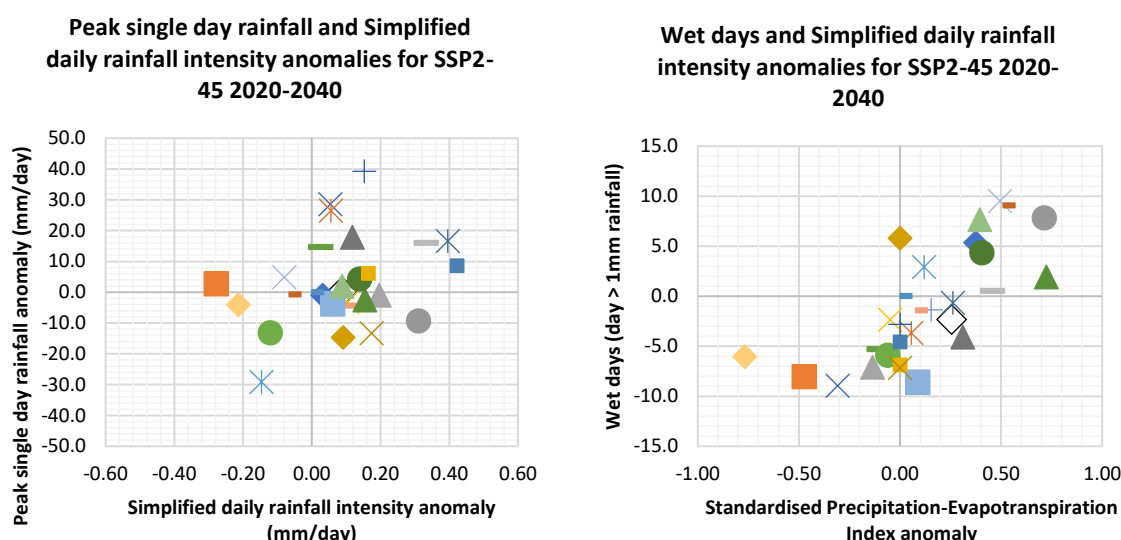


Figure 2-18. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

### Kratie

Kratie is projected to experience a statistically significant increase in annual rainfall, rising by 0.45% per decade (7.61 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 1,699 mm, with a 95% confidence range of 1,683.9 to 1,714.48 mm, and projections suggest it will reach 1,724 mm by 2050. The number of days with rainfall exceeding 20 mm is also expected to increase significantly, with a trend of 0.27 days per decade, averaging 7.43 days annually, and a 95% confidence range of 7.09 to 7.77 days. No changes are projected for days with rainfall exceeding 50 mm.

Extreme rainfall metrics also show significant increases. Single-day peak rainfall magnitude is projected to rise by 0.46 mm/decade, averaging 36.05 mm, with a confidence range of 35.13 to 36.96 mm. Similarly, the five-day peak rainfall magnitude is expected to increase by 1.35 mm/decade, averaging 100.64 mm, with a confidence range of 98.89 to 102.38 mm. Monthly peak rainfall is projected to rise by 3.41 mm/decade, averaging 332.4 mm, with a confidence range of 328.23 to 336.57 mm.

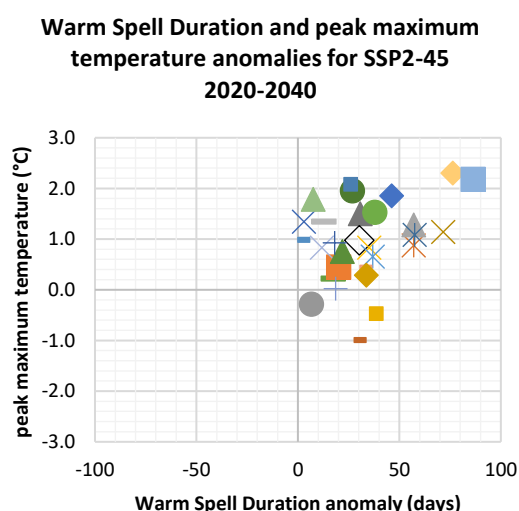
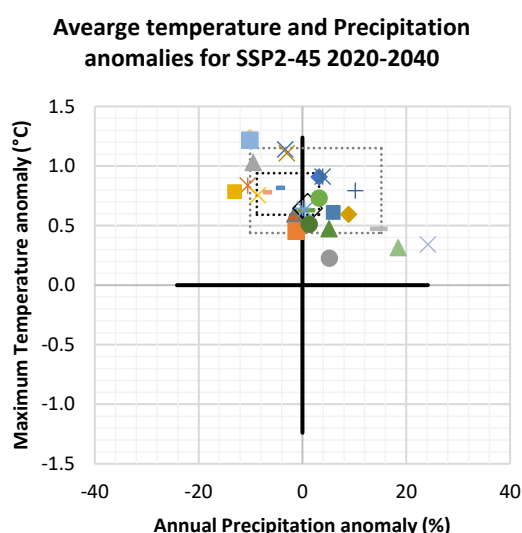
Projections indicate a slight improvement in Kratie's drought index, with a trend of 0.05 SPEI/decade and an average value of -0.14, suggesting potentially fewer severe droughts in the future, though the trend is not statistically significant. The 95% confidence range for this index is -0.18 to -0.09. Consecutive dry days are expected to increase slightly at 0.16 days per decade, averaging 46.64 days annually, with a confidence range of 44.8 to 48.49 days. Consecutive wet days are projected to decline slightly by -0.49 days per decade, averaging 103.08 days annually, with a confidence range of 100.08 to 106.08 days, though neither trend is statistically significant. The relative humidity is expected to decrease significantly at a rate of -0.19% per decade, averaging 69.51%, with a confidence range of 69.36 to 69.65%, and is projected to drop to 69.34% by 2050.

Kratie is expected to experience significant warming, with maximum temperatures increasing by 0.2149°C per decade. Between 2015 and 2035, the mean maximum temperature is projected to average 33°C, with a confidence range of 33.09 to 33.25°C, and remain at 33°C by 2050. Mean

temperatures are projected to rise by 0.22°C per decade, averaging 29.13°C, with a confidence range of 29.04 to 29.21°C, and reaching 29.38°C by 2050. Minimum temperatures are also expected to rise by 0.22°C per decade, averaging 25.07°C, with a confidence range of 24.98 to 25.15°C, and projected to reach 25.34°C by 2050.

Heat extremes are projected to intensify significantly in Kratie. Warm spell durations are expected to increase at a rate of 18.51 days per decade, averaging 28.8 days annually, with a confidence range of 24.95 to 32.66 days, and are projected to reach 43.68 days by 2050. The number of days exceeding 35°C is expected to increase by 9.73 days per decade, averaging 81.64 days annually, with a confidence range of 77.1 to 86.18 days, and reaching 94.17 days by 2050. Days exceeding 40°C remain rare, with no significant change projected.

Peak single-day temperatures are expected to rise at a rate of 0.26°C per decade, averaging 38.7°C annually, with a confidence range of 38.56 to 38.83°C, and reaching 39.05°C by 2050. Nights exceeding 20°C are projected to increase by 0.67 nights per decade, averaging 359.58 nights annually, with a confidence range of 359.14 to 360.02 nights, and reaching 360.59 nights by 2050. The lowest daily temperatures will rise at a rate of 0.23°C per decade, averaging 18.55°C, and are projected to reach 18.85°C by 2050



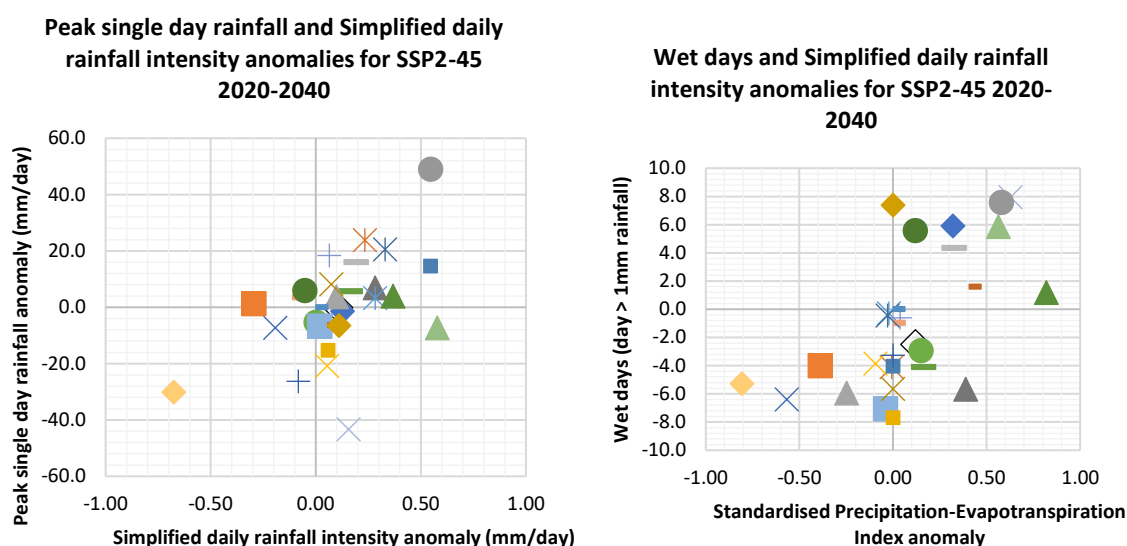


Figure 2-19. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

### Mondul Kiri

Mondul Kiri is projected to experience a statistically significant increase in annual rainfall, rising by 0.32% per decade (5.35 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 1,695 mm, with a 95% confidence range of 1,677.99 to 1,712.01 mm, and is projected to reach 1,716 mm by 2050. Days with rainfall exceeding 20 mm are expected to increase significantly, with a trend of 0.26 days per decade, averaging 7.95 days annually, and a confidence range of 7.62 to 8.29 days. No changes are projected for days with rainfall exceeding 50 mm.

Extreme rainfall metrics indicate significant increases. Single-day peak rainfall is projected to rise by 0.33 mm/decade, averaging 39.85 mm, with a confidence range of 38.82 to 40.89 mm. Similarly, the five-day peak rainfall magnitude is expected to increase by 1.03 mm/decade, averaging 106.7 mm, with a confidence range of 103.79 to 109.61 mm. Monthly peak rainfall is projected to rise by 2.71 mm/decade, averaging 337.3 mm, with a confidence range of 332.31 to 342.28 mm.

Mondul Kiri is projected to see improvements in its drought index, with a statistically significant increase of 0.04 SPEI/decade and an average value of -0.08, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.13 to -0.03. Consecutive dry days are expected to increase slightly at 0.12 days per decade, averaging 57.33 days annually, with a confidence range of 56 to 58.67 days, though this trend is not statistically significant. Consecutive wet days are projected to decrease slightly by -0.5 days per decade, averaging 105.62 days annually, with a confidence range of 102.02 to 109.22 days. Relative humidity is expected to decrease significantly by -0.19% per decade, averaging 69.79%, with a confidence range of 69.66 to 69.92%, and is projected to drop to 69.59% by 2050.

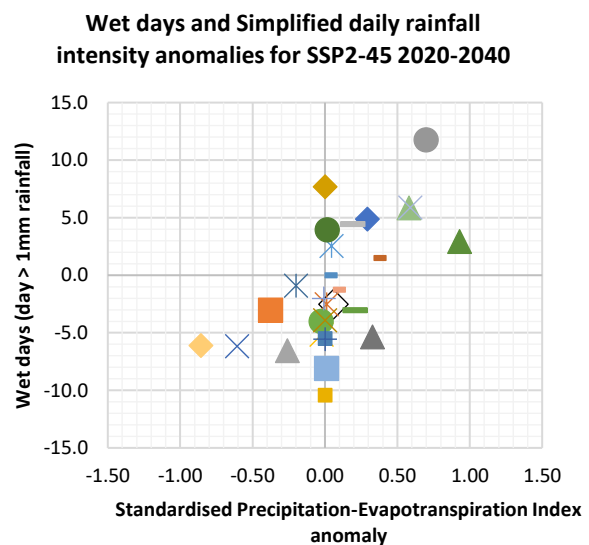
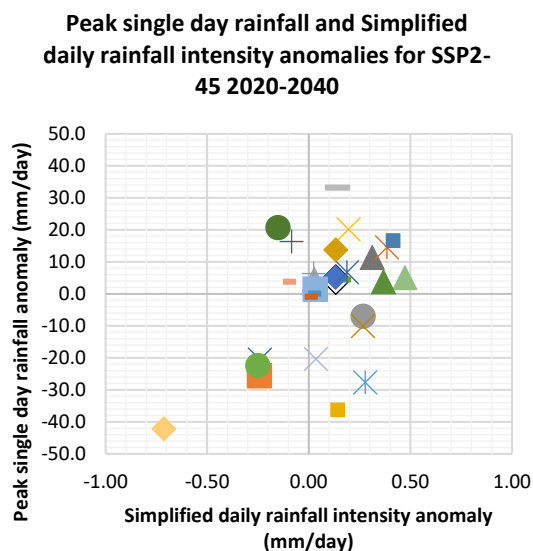
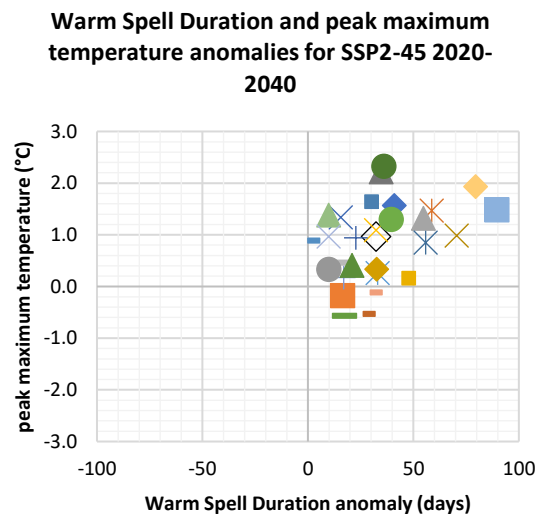
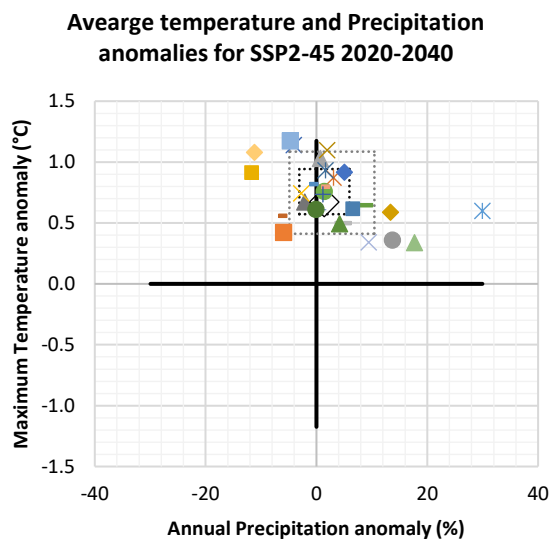
Mondul Kiri is expected to experience significant warming, with maximum temperatures increasing by 0.2166°C per decade. From 2015 to 2035, the mean maximum temperature is projected to average 32°C, with a confidence range of 31.95 to 32.14°C, and is expected to remain at 32°C by 2050. Mean temperatures are projected to rise by 0.22°C per decade, averaging 27.85°C, with a confidence range



of 27.76 to 27.94°C, and reaching 28.11°C by 2050. Minimum temperatures are also expected to rise at 0.21°C per decade, averaging 23.66°C, with a confidence range of 23.57 to 23.75°C, and projected to reach 23.92°C by 2050.

Heat extremes in Mondul Kiri are expected to intensify. Warm spell durations are projected to increase significantly, rising by 17.77 days per decade, with an average of 30.81 days annually, a confidence range of 26.63 to 34.99 days, and reaching 45.77 days by 2050. Days exceeding 35°C are expected to increase significantly by 7.65 days per decade, averaging 49.43 days annually, with a confidence range of 45.03 to 53.83 days, and reaching 58.48 days by 2050. Days exceeding 40°C remain rare, with no significant change projected.

Peak single-day temperatures are projected to rise at a rate of 0.26°C per decade, averaging 37.84°C, with a confidence range of 37.71 to 37.96°C, and reaching 38.19°C by 2050. Nights exceeding 20°C will increase by 1.82 nights per decade, averaging 347.62 nights annually, with a confidence range of 346.46 to 348.78 nights, and reaching 350.45 nights by 2050. The lowest daily temperatures are expected to rise by 0.24°C per decade, averaging 16.98°C, and reaching 17.29°C by 2050.





*Figure 2-20. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

### *Oddar Meanchey*

Oddar Meanchey is projected to experience a statistically significant increase in annual rainfall, rising by 0.57% per decade (6.95 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 1,219 mm, with a 95% confidence range of 1,207.23 to 1,231.25 mm, and is projected to reach 1,235 mm by 2050. Days with rainfall exceeding 20 mm are expected to increase significantly, with a trend of 0.15 days per decade, averaging 3.72 days annually, and a 95% confidence range of 3.49 to 3.96 days. Days with rainfall above 50 mm remain unchanged.

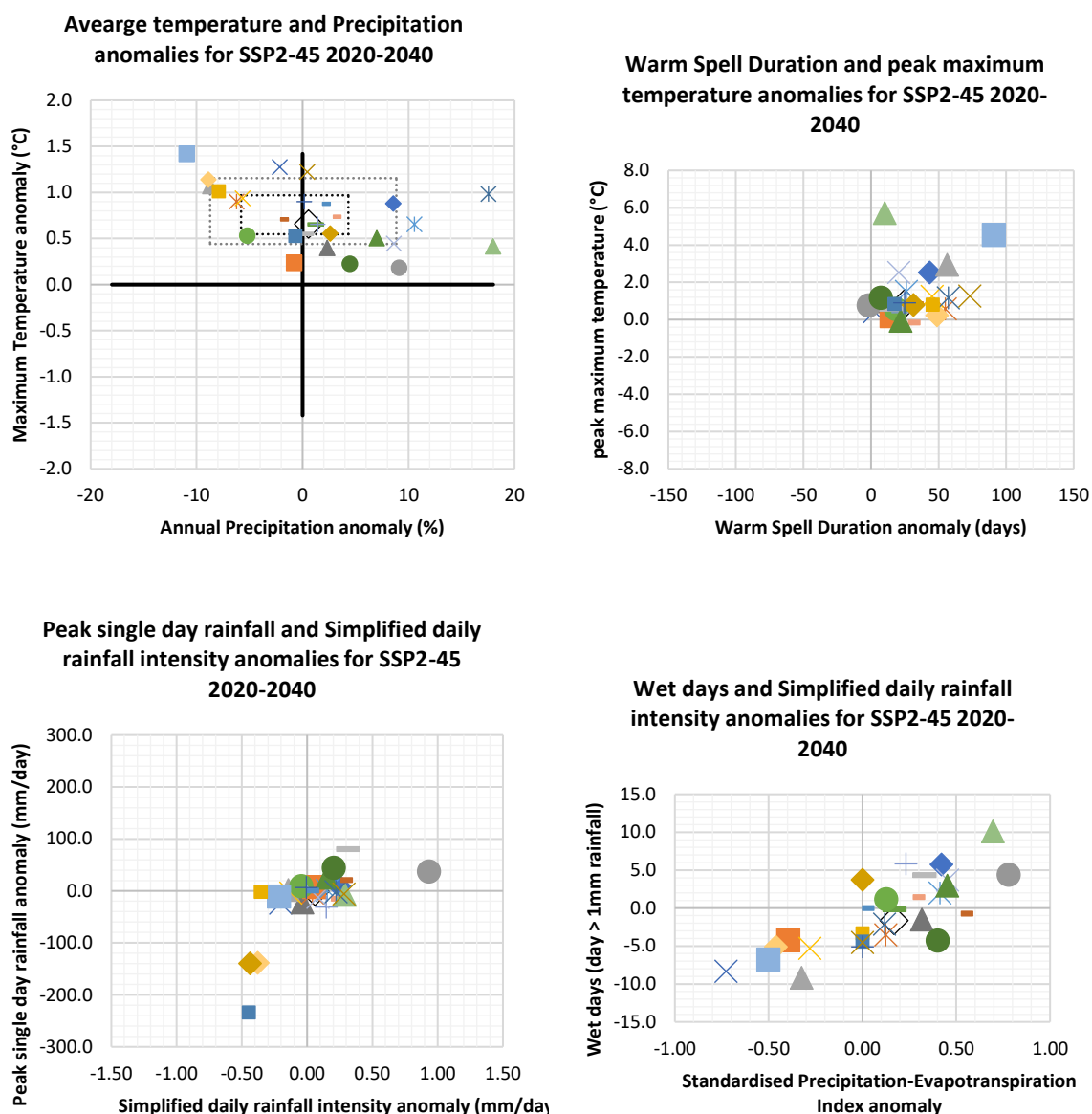
Extreme rainfall metrics also show significant increases. Single-day peak rainfall magnitude is projected to rise by 0.47 mm/decade, averaging 31.83 mm, with a confidence range of 30.88 to 32.78 mm. The five-day peak rainfall magnitude is expected to increase by 0.9 mm/decade, averaging 87.39 mm, with a confidence range of 85.59 to 89.19 mm. Monthly peak rainfall is projected to rise by 1.29 mm/decade, averaging 267.64 mm, with a confidence range of 263.1 to 272.19 mm.

Oddar Meanchey's drought index is projected to improve significantly, with an increase of 0.04 SPEI/decade and an average value of -0.13, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.18 to -0.08. Consecutive dry days are expected to decrease slightly by -0.1 days per decade, averaging 45.01 days annually, with a confidence range of 44.18 to 45.84 days, though this trend is not statistically significant. Consecutive wet days are projected to increase marginally by 0.03 days per decade, averaging 60.6 days annually, with a confidence range of 58.06 to 63.13 days. Relative humidity is expected to decrease significantly by -0.17% per decade, averaging 68.87%, with a confidence range of 68.75 to 68.98%, and is projected to drop to 68.68% by 2050.

Oddar Meanchey is expected to experience significant warming, with maximum temperatures increasing by 0.2219°C per decade. From 2015 to 2035, the mean maximum temperature is projected to average 33°C, with a confidence range of 33.17 to 33.35°C, and reach 34°C by 2050. Mean temperatures are projected to rise by 0.22°C per decade, averaging 28.85°C, with a confidence range of 28.76 to 28.94°C, and reaching 29.14°C by 2050. Minimum temperatures are also expected to rise by 0.22°C per decade, averaging 24.44°C, with a confidence range of 24.35 to 24.54°C, and projected to reach 24.73°C by 2050.

Extreme heat events in Oddar Meanchey are expected to intensify. Warm spell durations are projected to increase significantly, rising by 15.37 days per decade, with an average of 30.5 days annually, a confidence range of 26.97 to 34.02 days, and reaching 44.31 days by 2050. The number of days exceeding 35°C is projected to increase significantly by 9.43 days per decade, averaging 89.1 days annually, with a confidence range of 85.1 to 93.09 days, and reaching 100.31 days by 2050. Days exceeding 40°C are expected to rise slightly by 1.76 days per decade, with an average of 0.63 days annually, and a confidence range of 0.28 to 0.97 days, reaching approximately 1.67 days by 2050.

Peak single-day temperatures are projected to rise at a rate of 0.28°C per decade, averaging 39.85°C annually, with a confidence range of 39.69 to 40.02°C, and reaching 40.24°C by 2050. Nights exceeding 20°C are projected to increase by 2.68 nights per decade, averaging 335.94 nights annually, with a confidence range of 334.19 to 337.68 nights, and reaching 340.65 nights by 2050. The lowest daily temperatures are expected to rise by 0.23°C per decade, averaging 15.98°C, and reaching 16.23°C by 2050.



*Figure 2-21. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

### Phnom Penh

Phnom Penh is projected to experience a statistically significant increase in annual rainfall, rising by 0.43% per decade (5.92 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 1,385 mm, with a 95% confidence range of 1,370.65 to 1,400.02 mm, and is projected to reach 1,401 mm by 2050. Days with rainfall exceeding 20 mm are expected to increase significantly, with a trend of 0.08 days per decade, averaging 2.92 days annually, and a 95% confidence range of 2.74 to 3.1 days. No changes are projected for days with rainfall exceeding 50 mm.

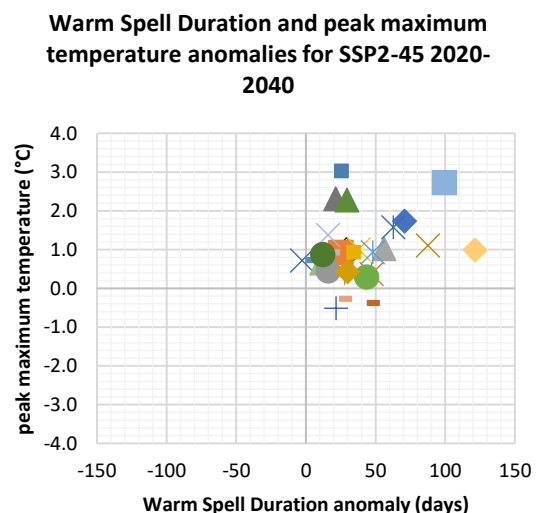
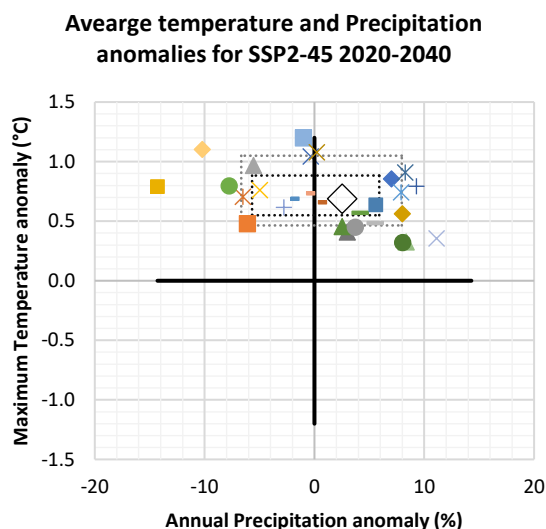
Extreme rainfall metrics also show statistically significant increases. Single-day peak rainfall magnitude is projected to rise by 0.23 mm/decade, averaging 27.7 mm, with a confidence range of 27.02 to 28.38 mm. The five-day peak rainfall magnitude is expected to increase by 0.7 mm/decade, averaging 82.81 mm, with a confidence range of 81.4 to 84.22 mm. Monthly peak rainfall is projected to rise by 1.18 mm/decade, averaging 280.22 mm, with a confidence range of 276.61 to 283.84 mm.

The drought index in Phnom Penh is projected to improve significantly, with an increase of 0.03 SPEI/decade and an average value of -0.11, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.17 to -0.05. Consecutive dry days are expected to remain stable, with no statistically significant changes, averaging 32.33 days annually, with a confidence range of 31 to 33.65 days. Consecutive wet days are projected to decline significantly, decreasing by -0.6 days per decade, averaging 81.19 days annually, with a confidence range of 78.45 to 83.93 days. The relative humidity is expected to decrease significantly at a rate of -0.14% per decade, averaging 69.73%, with a confidence range of 69.57 to 69.89%, and is projected to drop to 69.61% by 2050.

Phnom Penh is expected to experience significant warming, with maximum temperatures increasing by 0.2058°C per decade. From 2015 to 2035, the mean maximum temperature is projected to average 33°C, with a confidence range of 33.32 to 33.48°C, and reach 34°C by 2050. Mean temperatures are projected to rise by 0.21°C per decade, averaging 29.39°C, with a confidence range of 29.3 to 29.47°C, and reaching 29.65°C by 2050. Minimum temperatures are also expected to rise by 0.22°C per decade, averaging 25.38°C, with a confidence range of 25.29 to 25.47°C, and projected to reach 25.67°C by 2050.

Heat extremes in Phnom Penh are projected to intensify. Warm spell durations are expected to increase significantly, rising by 19.16 days per decade, with an average of 31.84 days annually, a confidence range of 27.62 to 36.07 days, and reaching 48.39 days by 2050. The number of days exceeding 35°C is projected to increase significantly by 11.51 days per decade, averaging 80.93 days annually, with a confidence range of 76.21 to 85.66 days, and reaching 93.49 days by 2050. Days exceeding 40°C remain rare, with no significant changes projected.

Peak single-day temperatures are projected to rise at a rate of 0.26°C per decade, averaging 38.28°C annually, with a confidence range of 38.16 to 38.41°C, and reaching 38.57°C by 2050. Nights exceeding 20°C are expected to increase by 0.6 nights per decade, averaging 360.86 nights annually, with a confidence range of 360.47 to 361.25 nights, and reaching 361.59 nights by 2050. The lowest daily temperatures are projected to rise by 0.23°C per decade, averaging 18.99°C, and reaching 19.24°C by 2050.



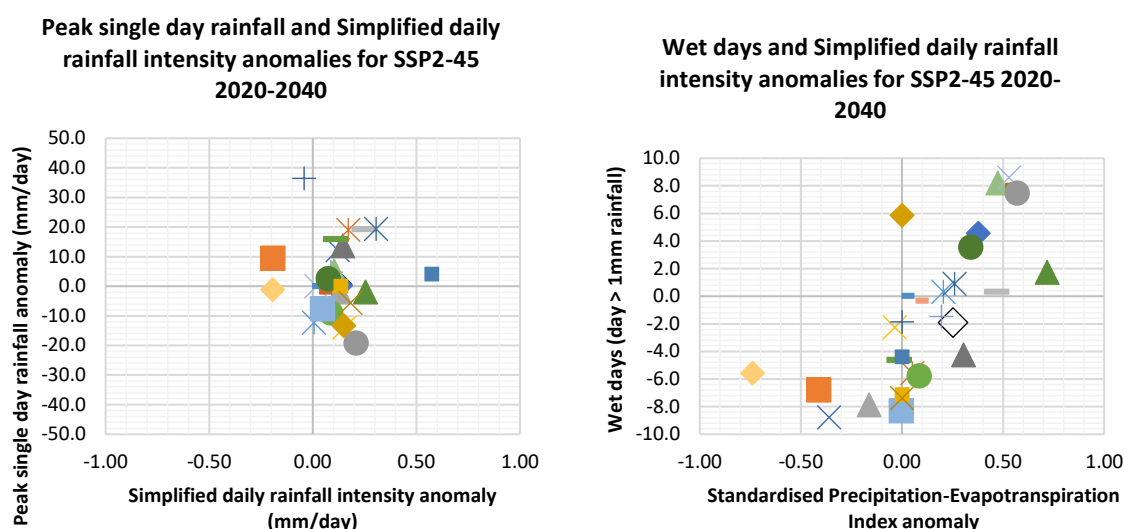


Figure 2-22. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

#### Preah Sihanouk

Preah Sihanouk is projected to experience a statistically significant increase in annual rainfall, rising by 0.43% per decade (13.15 mm/decade). Between 2015 and 2035, the mean annual rainfall is expected to average 3,059 mm, with a 95% confidence range of 3,034.66 to 3,082.67 mm, and projections suggest it will reach 3,079 mm by 2050. Days with rainfall exceeding 20 mm are expected to increase significantly, with a trend of 0.45 days per decade, averaging 39.99 days annually, and a 95% confidence range of 39.23 to 40.76 days. Additionally, days with rainfall above 50 mm will rise at a rate of 0.09 days per decade, averaging 1.61 days annually, with a confidence range of 1.45 to 1.76 days.

Extreme rainfall metrics indicate statistically significant increases. Single-day peak rainfall magnitude is projected to rise by 0.34 mm/decade, averaging 57.9 mm, with a confidence range of 56.95 to 58.85 mm. Similarly, the five-day peak rainfall magnitude is expected to increase by 1.48 mm/decade, averaging 179.72 mm, with a confidence range of 176.66 to 182.78 mm. Monthly peak rainfall is projected to rise by 3.61 mm/decade, averaging 572.85 mm, with a confidence range of 562.68 to 583.03 mm.

The drought index in Preah Sihanouk is projected to improve significantly, with an increase of 0.04 SPEI/decade and an average value of -0.08, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.16 to 0.01. Consecutive dry days are expected to decrease significantly by -0.15 days per decade, averaging 15.68 days annually, with a confidence range of 15.17 to 16.18 days. However, consecutive wet days are projected to decrease significantly by -1.19 days per decade, averaging 166.02 days annually, with a confidence range of 161.9 to 170.14 days. The relative humidity is expected to decrease at a statistically significant rate of -0.09% per decade, averaging 81.07%, with a confidence range of 80.96 to 81.19%, and is projected to drop to 80.97% by 2050.

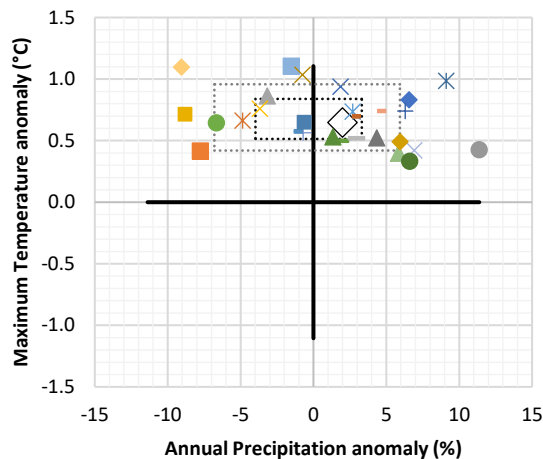
Preah Sihanouk is projected to experience significant warming, with maximum temperatures increasing by 0.2001°C per decade. Between 2015 and 2035, the mean maximum temperature is expected to average 31°C, with a confidence range of 30.44 to 30.6°C, and remain at 31°C by 2050. Mean temperatures are projected to rise by 0.2°C per decade, averaging 27.47°C, with a confidence range of 27.39 to 27.55°C, and reaching 27.74°C by 2050. Minimum temperatures are also expected

to rise by 0.21°C per decade, averaging 24.42°C, with a confidence range of 24.34 to 24.5°C, and projected to reach 24.7°C by 2050.

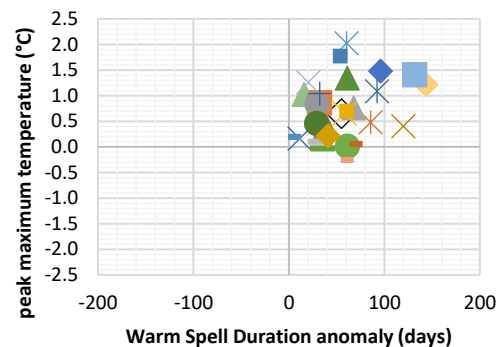
Heat extremes are expected to intensify in Preah Sihanouk. Warm spell durations are projected to increase significantly, rising by 29.59 days per decade, with an average of 45.7 days annually, a confidence range of 38.23 to 53.18 days, and reaching 78.56 days by 2050. The number of days exceeding 25°C will remain consistently high, with no significant changes, averaging 364.99 days annually. Days exceeding 35°C are projected to increase slightly, with a statistically significant trend of 0.15 days per decade, though these events remain rare.

Peak single-day temperatures are projected to rise at a rate of 0.21°C per decade, averaging 33.64°C annually, with a confidence range of 33.54 to 33.75°C, and reaching 33.92°C by 2050. Nights exceeding 20°C will increase by 0.66 nights per decade, averaging 360.13 nights annually, with a confidence range of 359.62 to 360.64 nights, and reaching 361.18 nights by 2050. The lowest daily temperatures are expected to rise by 0.23°C per decade, averaging 19.19°C, and reaching 19.42°C by 2050.

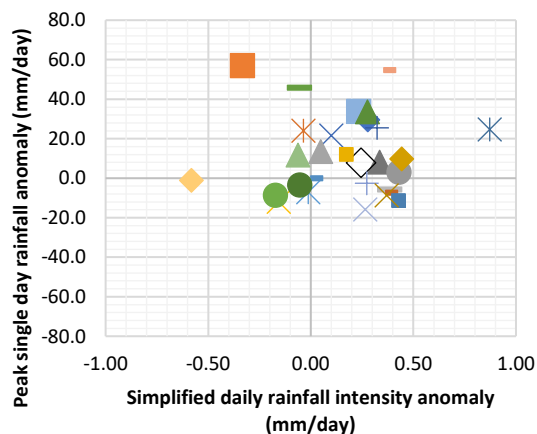
**Average temperature and Precipitation anomalies for SSP2-45 2020-2040**



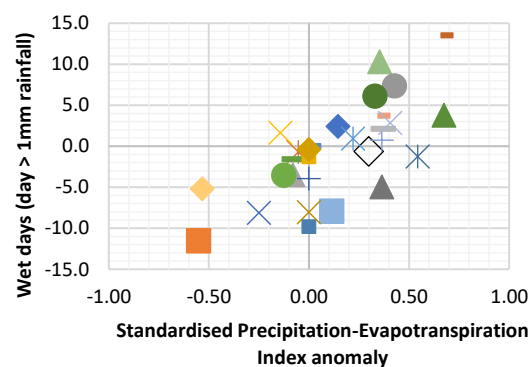
**Warm Spell Duration and peak maximum temperature anomalies for SSP2-45 2020-2040**



**Peak single day rainfall and Simplified daily rainfall intensity anomalies for SSP2-45 2020-2040**



**Wet days and Simplified daily rainfall intensity anomalies for SSP2-45 2020-2040**



*Figure 2-23. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

### *Preah Vihear*

Preah Vihear is projected to experience a statistically significant increase in annual rainfall, rising by 0.43% per decade (7.55 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 1,760 mm, with a 95% confidence range of 1,745.9 to 1,774.39 mm, and is projected to reach 1,784 mm by 2050. Days with rainfall exceeding 20 mm are expected to increase significantly, with a trend of 0.29 days per decade, averaging 9.29 days annually, and a confidence range of 8.94 to 9.64 days. Days with rainfall exceeding 50 mm show no statistically significant increase.

Extreme rainfall metrics indicate statistically significant increases. Single-day peak rainfall magnitude is projected to rise by 0.77 mm/decade, averaging 36.28 mm, with a confidence range of 35.5 to 37.06 mm. Similarly, the five-day peak rainfall magnitude is expected to increase by 1.62 mm/decade, averaging 108.08 mm, with a confidence range of 106.4 to 109.77 mm. Monthly peak rainfall is projected to rise by 3.02 mm/decade, averaging 347.58 mm, with a confidence range of 343.25 to 351.91 mm.

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The drought index in Preah Vihear is projected to improve significantly, with an increase of 0.03 SPEI/decade and an average value of -0.11, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.17 to -0.05. Consecutive dry days are expected to increase slightly, though not significantly, by 0.03 days per decade, averaging 40.52 days annually, with a confidence range of 39.29 to 41.76 days. Consecutive wet days are projected to decrease significantly, with a trend of -1.17 days per decade, averaging 97.74 days annually, and a confidence range of 93.71 to 101.78 days. Relative humidity is expected to decrease significantly at a rate of -0.2% per decade, averaging 72.87%, with a confidence range of 72.71 to 73.02%, and is projected to drop to 72.58% by 2050.

Preah Vihear is projected to experience significant warming, with maximum temperatures increasing by 0.2239°C per decade. Between 2015 and 2035, the mean maximum temperature is expected to average 33°C, with a confidence range of 32.52 to 32.69°C, and remain at 33°C by 2050. Mean temperatures are projected to rise by 0.23°C per decade, averaging 28.25°C, with a confidence range of 28.16 to 28.34°C, and reaching 28.53°C by 2050. Minimum temperatures are also expected to rise by 0.23°C per decade, averaging 23.88°C, with a confidence range of 23.8 to 23.97°C, and projected to reach 24.18°C by 2050.

Heat extremes in Preah Vihear are expected to intensify. Warm spell durations are projected to increase significantly, rising by 16.75 days per decade, with an average of 30.27 days annually, a confidence range of 26.53 to 34 days, and reaching 46.14 days by 2050. The number of days exceeding 35°C is projected to increase significantly by 8.58 days per decade, averaging 63.48 days annually, with a confidence range of 59.97 to 66.99 days, and reaching 72.26 days by 2050. Days exceeding 40°C remain rare, with no significant changes projected.

Peak single-day temperatures are projected to rise at a rate of 0.28°C per decade, averaging 38.55°C annually, with a confidence range of 38.43 to 38.68°C, and reaching 38.94°C by 2050. Nights exceeding 20°C will increase by 2.9 nights per decade, averaging 334.33 nights annually, with a confidence range of 332.64 to 336.03 nights, and reaching 338.8 nights by 2050. The lowest daily temperatures are expected to rise by 0.25°C per decade, averaging 15.76°C, and reaching 16.06°C by 2050.



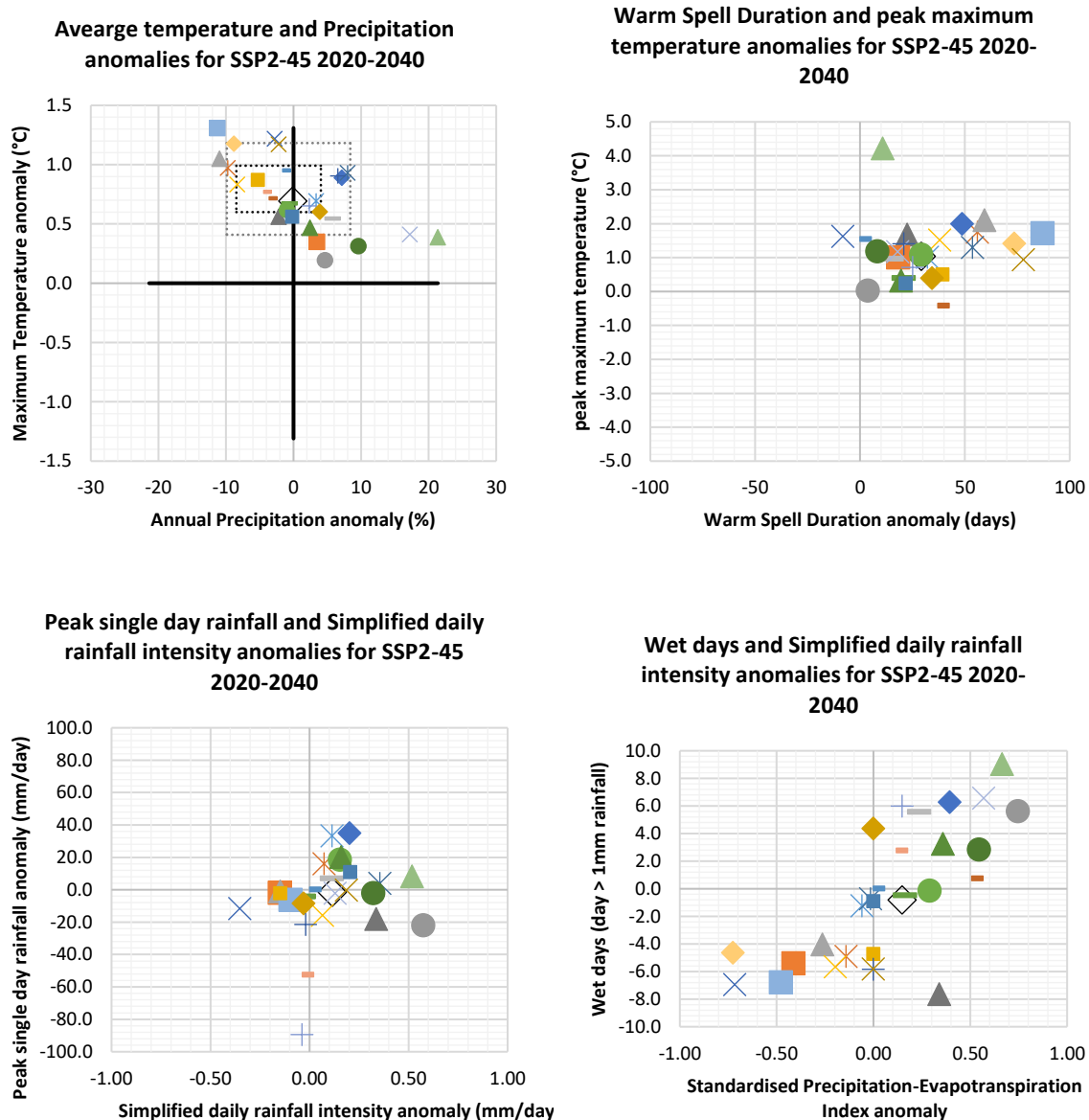


Figure 2-24. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

### Prey Veng

Prey Veng is projected to experience a statistically significant increase in annual rainfall, rising by 0.5% per decade (7.68 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 1,550 mm, with a 95% confidence range of 1,533.92 to 1,566.27 mm, and is projected to reach 1,569 mm by 2050. Days with rainfall exceeding 20 mm are expected to increase significantly, with a trend of 0.18 days per decade, averaging 3.9 days annually, and a confidence range of 3.75 to 4.05 days. No significant changes are projected for days with rainfall above 50 mm.

Extreme rainfall metrics indicate statistically significant increases. Single-day peak rainfall magnitude is projected to rise by 0.35 mm/decade, averaging 29 mm, with a confidence range of 28.32 to 29.68 mm. The five-day peak rainfall magnitude is expected to increase by 0.87 mm/decade, averaging 86.97

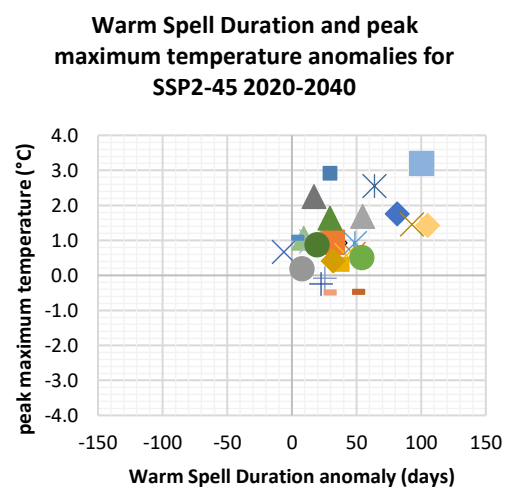
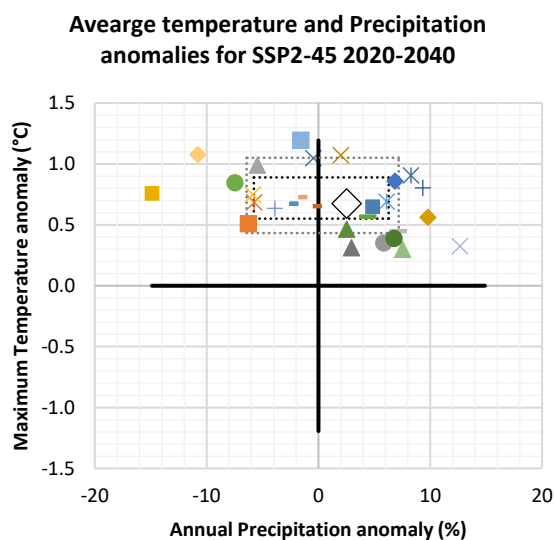
mm, with a confidence range of 85.4 to 88.54 mm. Monthly peak rainfall is projected to rise by 1.92 mm/decade, averaging 302.08 mm, with a confidence range of 298.55 to 305.61 mm.

The drought index in Prey Veng is projected to improve significantly, with an increase of 0.04 SPEI/decade and an average value of -0.11, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.18 to -0.04. Consecutive dry days are expected to decrease slightly, though not significantly, by -0.01 days per decade, averaging 34.42 days annually, with a confidence range of 32.78 to 36.07 days. Consecutive wet days are projected to decrease marginally by -0.59 days per decade, averaging 93.73 days annually, with a confidence range of 90.28 to 97.19 days. Relative humidity is expected to decrease significantly at a rate of -0.14% per decade, averaging 70.59%, with a confidence range of 70.42 to 70.75%, and is projected to drop to 70.48% by 2050.

Prey Veng is projected to experience significant warming, with maximum temperatures increasing by 0.2064°C per decade. Between 2015 and 2035, the mean maximum temperature is expected to average 33°C, with a confidence range of 33.19 to 33.37°C, and reach 34°C by 2050. Mean temperatures are projected to rise by 0.21°C per decade, averaging 29.32°C, with a confidence range of 29.23 to 29.4°C, and reaching 29.57°C by 2050. Minimum temperatures are also expected to rise by 0.21°C per decade, averaging 25.35°C, with a confidence range of 25.27 to 25.44°C, and projected to reach 25.63°C by 2050.

Heat extremes in Prey Veng are projected to intensify. Warm spell durations are expected to increase significantly, rising by 20.4 days per decade, with an average of 31.27 days annually, a confidence range of 26.35 to 36.19 days, and reaching 48.25 days by 2050. The number of days exceeding 35°C is projected to increase significantly by 11.43 days per decade, averaging 66.98 days annually, with a confidence range of 62.13 to 71.83 days, and reaching 79.33 days by 2050. Days exceeding 40°C remain rare, with no significant changes projected.

Peak single-day temperatures are projected to rise at a rate of 0.26°C per decade, averaging 37.97°C annually, with a confidence range of 37.84 to 38.1°C, and reaching 38.26°C by 2050. Nights exceeding 20°C will increase by 0.52 nights per decade, averaging 361.68 nights annually, with a confidence range of 361.26 to 362.1 nights, and reaching 362.31 nights by 2050. The lowest daily temperatures are expected to rise by 0.23°C per decade, averaging 19.25°C, and reaching 19.52°C by 2050.





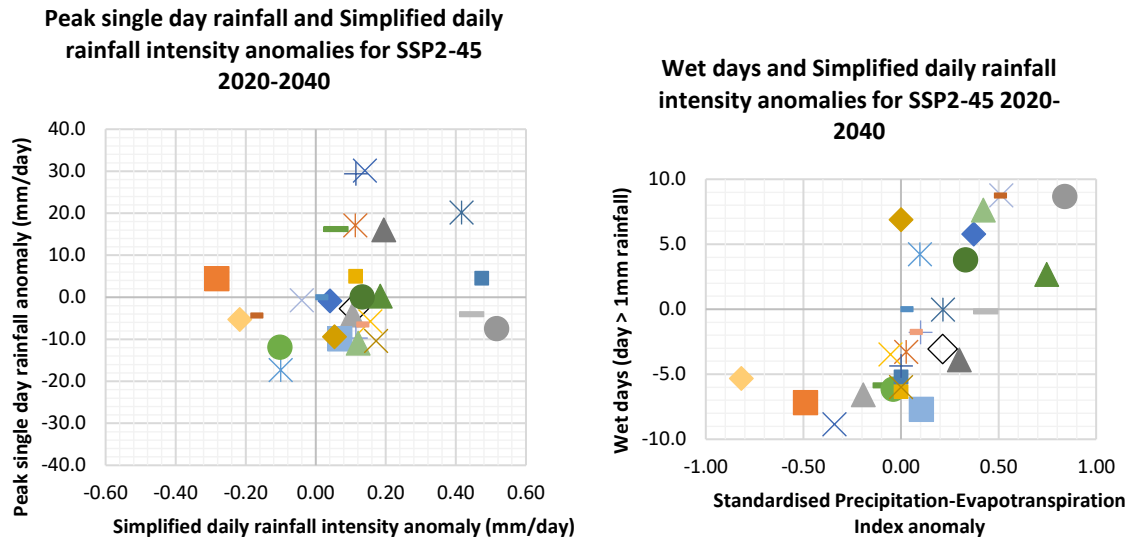


Figure 2-25. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

#### Ratanak Kiri

Ratanak Kiri is projected to experience a statistically significant increase in annual rainfall, rising by 0.39% per decade (8.84 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 2,267 mm, with a 95% confidence range of 2,247.49 to 2,285.66 mm, and is projected to reach 2,286 mm by 2050. Days with rainfall exceeding 20 mm are expected to increase significantly, with a trend of 0.45 days per decade, averaging 23.19 days annually, and a confidence range of 22.63 to 23.75 days. Days with rainfall exceeding 50 mm will also increase, with a statistically significant trend of 0.05 days per decade, averaging 0.85 days annually, and a confidence range of 0.75 to 0.96 days.

Extreme rainfall events show significant increases. Single-day peak rainfall magnitude is projected to rise by 0.79 mm/decade, averaging 52.93 mm, with a confidence range of 51.81 to 54.05 mm. Similarly, the five-day peak rainfall magnitude is expected to increase by 2.02 mm/decade, averaging 151.02 mm, with a confidence range of 147.55 to 154.49 mm. Monthly peak rainfall is projected to rise by 4.6 mm/decade, averaging 474.33 mm, with a confidence range of 467.72 to 480.94 mm.

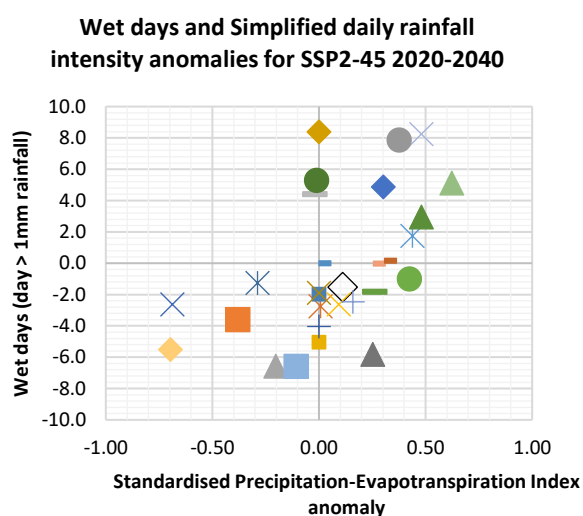
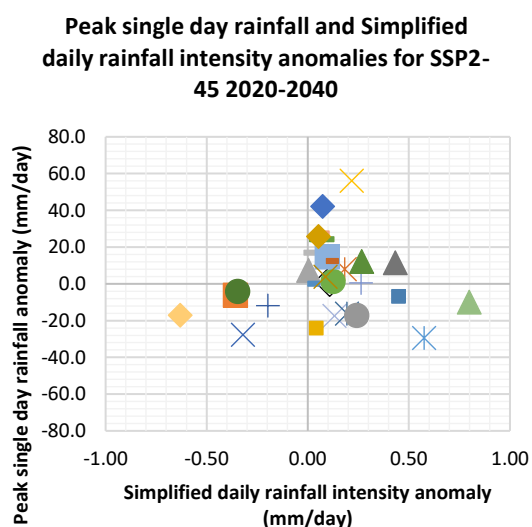
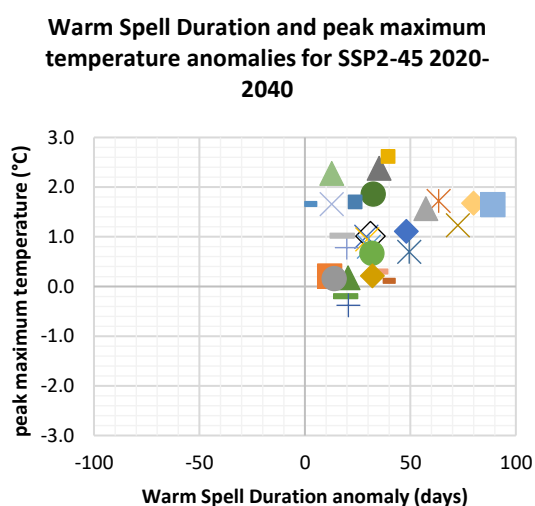
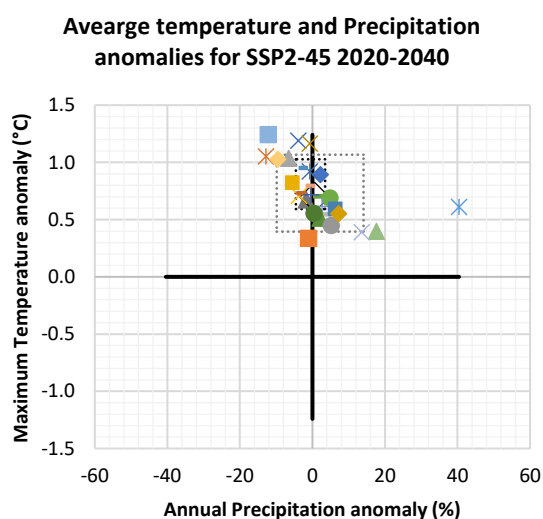
The drought index in Ratanak Kiri is projected to improve significantly, with an increase of 0.04 SPEI/decade and an average value of -0.1, suggesting fewer severe droughts in the future. The 95% confidence range for this index is -0.17 to -0.04. Consecutive dry days are expected to increase slightly, though not significantly, by 0.24 days per decade, averaging 60.21 days annually, with a confidence range of 58.84 to 61.58 days. Consecutive wet days are projected to decrease slightly by -0.52 days per decade, averaging 152.34 days annually, with a confidence range of 149.01 to 155.68 days. Relative humidity is expected to decrease significantly at a rate of -0.17% per decade, averaging 70.57%, with a confidence range of 70.44 to 70.71%, and is projected to drop to 70.37% by 2050.

Ratanak Kiri is projected to experience significant warming, with maximum temperatures increasing by 0.2157°C per decade. Between 2015 and 2035, the mean maximum temperature is expected to average 33°C, with a confidence range of 32.52 to 32.7°C, and remain at 33°C by 2050. Mean temperatures are projected to rise by 0.21°C per decade, averaging 28.11°C, with a confidence range of 28.02 to 28.2°C, and reaching 28.38°C by 2050. Minimum temperatures are also expected to rise by

0.21°C per decade, averaging 23.62°C, with a confidence range of 23.54 to 23.7°C, and projected to reach 23.88°C by 2050.

Heat extremes in Ratanak Kiri are projected to intensify. Warm spell durations are expected to increase significantly, rising by 15.58 days per decade, with an average of 31.11 days annually, a confidence range of 26.9 to 35.32 days, and reaching 45.19 days by 2050. The number of days exceeding 35°C is projected to increase significantly by 7.43 days per decade, averaging 77.15 days annually, with a confidence range of 73.98 to 80.33 days, and reaching 86.04 days by 2050. Days exceeding 40°C are rare but projected to slightly increase, with a trend of 0.45 days per decade and reaching 0.02 days by 2050.

Peak single-day temperatures are projected to rise at a rate of 0.26°C per decade, averaging 38.89°C annually, with a confidence range of 38.75 to 39.03°C, and reaching 39.24°C by 2050. Nights exceeding 20°C will increase by 2.4 nights per decade, averaging 340.96 nights annually, with a confidence range of 339.55 to 342.37 nights, and reaching 344.61 nights by 2050. The lowest daily temperatures are expected to rise by 0.23°C per decade, averaging 16.53°C, and reaching 16.79°C by 2050.



*Figure 2-26. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

### *Siemreap*

Siem Reap is projected to experience a statistically significant increase in annual rainfall, with a rise of 0.43% per decade (6.71 mm/decade). From 2015 to 2035, the mean annual rainfall is expected to average 1,555 mm, with a 95% confidence range of 1,539.04 to 1,571.34 mm, reaching 1,572 mm by 2050. Days with rainfall exceeding 20 mm are expected to increase significantly, rising by 0.16 days per decade, averaging 7 days annually, and a confidence range of 6.54 to 7.46 days. The number of days with rainfall exceeding 50 mm shows a non-significant increase, with an average of 0 days annually for 2020–2050.

Extreme rainfall events are also intensifying. Single-day peak rainfall magnitude is projected to increase significantly by 0.5 mm/decade, averaging 36.67 mm annually, with a confidence range of 35.69 to 37.65 mm. Similarly, the five-day peak rainfall magnitude is expected to rise by 1.1 mm/decade, averaging 100.26 mm annually, with a confidence range of 97.9 to 102.62 mm. Monthly peak rainfall is projected to increase significantly by 2.03 mm/decade, averaging 315.74 mm annually, with a confidence range of 310.36 to 321.11 mm.

The drought index in Siem Reap is expected to improve significantly, with an increase of 0.03 SPEI/decade, averaging -0.09, indicating fewer severe droughts in the future. The confidence range for this index is -0.14 to -0.04. Consecutive dry days are expected to decrease slightly, though not significantly, by -0.12 days per decade, averaging 36.38 days annually, with a confidence range of 35.24 to 37.52 days. Consecutive wet days are projected to decrease by -0.39 days per decade, averaging 73.62 days annually, with a confidence range of 70.06 to 77.17 days. The relative humidity is expected to decrease significantly at a rate of -0.19% per decade, averaging 72.68%, with a confidence range of 72.53 to 72.82%, and is projected to drop to 72.51% by 2050.

Siem Reap is projected to experience significant warming. Maximum temperatures are expected to rise by 0.2213°C per decade, with an average of 33°C from 2015 to 2035, and a confidence range of 32.51 to 32.68°C, remaining at 33°C by 2050. Mean temperatures are projected to increase by 0.22°C per decade, averaging 28.51°C, with a confidence range of 28.43 to 28.6°C, and reaching 28.81°C by 2050. Minimum temperatures are expected to rise by 0.22°C per decade, averaging 24.46°C, with a confidence range of 24.37 to 24.54°C, and reaching 24.74°C by 2050.

Heat extremes in Siem Reap are projected to intensify. Warm spell durations are expected to increase significantly by 16.58 days per decade, with an average of 29.33 days annually, a confidence range of 26.04 to 32.62 days, and reaching 43.68 days by 2050. Days exceeding 25°C are projected to increase slightly, reaching 364.87 days annually by 2050. Days exceeding 35°C are expected to rise significantly by 9.49 days per decade, averaging 54.71 days annually, with a confidence range of 51.15 to 58.28 days, and reaching 64.84 days by 2050. Days exceeding 40°C remain rare and are not expected to change significantly.

Peak single-day temperatures are projected to increase by 0.26°C per decade, averaging 38.31°C annually, with a confidence range of 38.15 to 38.48°C, and reaching 38.67°C by 2050. Tropical nights (nights above 20°C) are expected to increase significantly by 2.17 nights per decade, averaging 342.24 nights annually, with a confidence range of 340.67 to 343.8 nights, and reaching 345.97 nights by 2050. The lowest daily temperatures are expected to rise by 0.23°C per decade, averaging 16.42°C, and reaching 16.66°C by 2050.

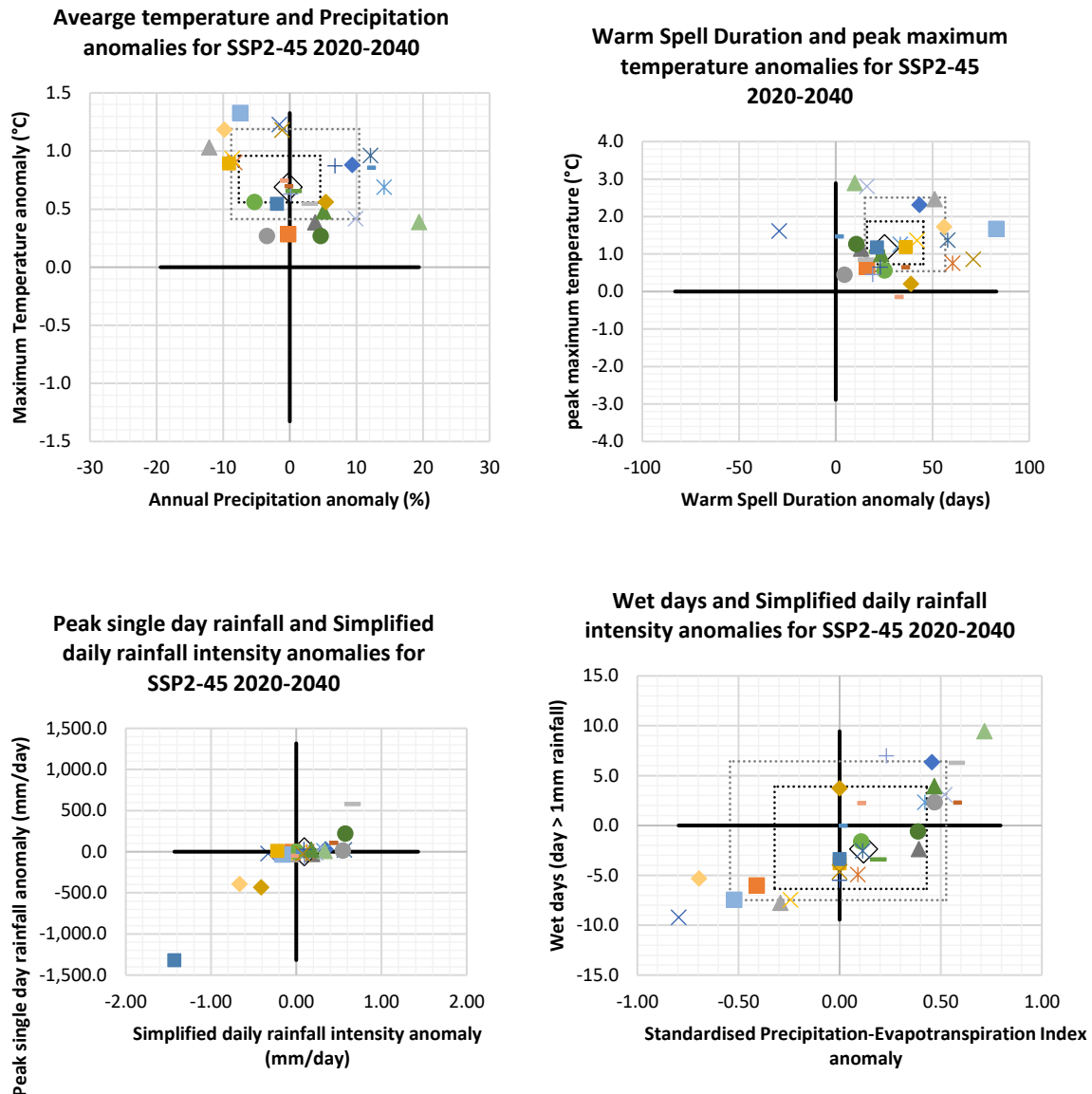


Figure 2-27. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

### Stung Treng

Stung Treng is expected to experience a significant increase in annual rainfall, with a projected rise of 0.51% per decade (10.7 mm/decade). The mean annual rainfall for 2015–2035 is estimated at 2,112 mm, with a 95% confidence range of 2,095.87 to 2,127.28 mm, and it is projected to reach 2,140 mm by 2050. Days with rainfall exceeding 20 mm are projected to increase significantly by 0.43 days per decade, averaging 18.26 days annually, with a confidence range of 17.77 to 18.74 days. Similarly, days with rainfall exceeding 50 mm are expected to rise by 0.06 days per decade, averaging 0.04 days by 2050, with a statistically significant trend.

The intensity of rainfall events is also projected to increase. Single-day peak rainfall is expected to rise significantly by 0.68 mm/decade, averaging 44.72 mm annually, with a confidence range of 43.65 to 45.79 mm. For five-day peak rainfall, a significant increase of 1.71 mm/decade is projected, with an average of 131.3 mm and a confidence range of 129.25 to 133.34 mm. The largest monthly cumulative

rainfall is also set to rise significantly by 4.47 mm/decade, with an average of 432.01 mm and a confidence range of 426.6 to 437.42 mm.

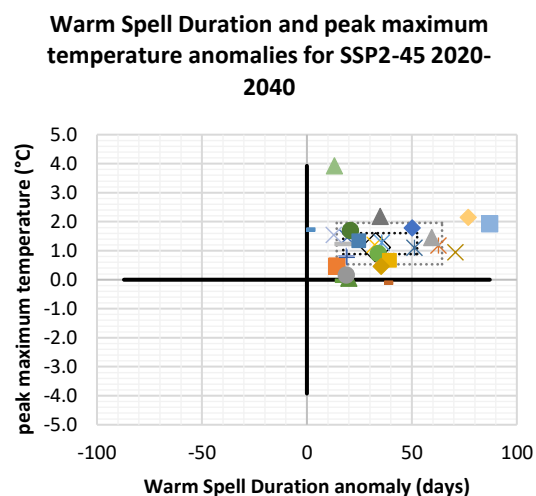
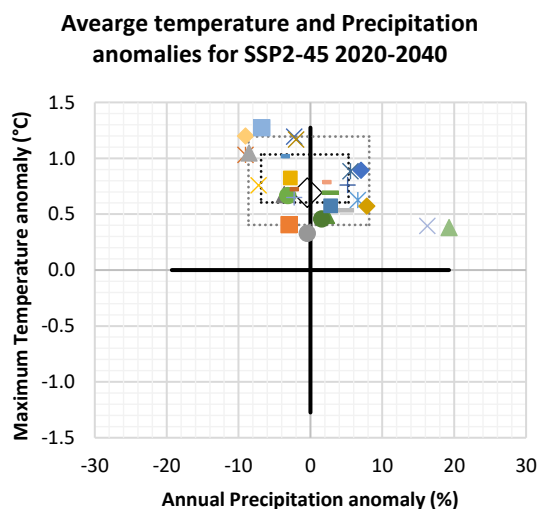
While the drought index (SPEI) shows a projected improvement of 0.05 SPEI/decade, indicating fewer severe droughts, this trend is not statistically significant. The average SPEI value is -0.16, with a confidence range of -0.22 to -0.1. Consecutive dry days are projected to increase slightly by 0.05 days per decade, averaging 54.71 days annually, though this trend is not statistically significant. Consecutive wet days are expected to decrease by 0.5 days per decade, with an average of 140.2 days, though this decrease is also not statistically significant.

Relative humidity is projected to decrease significantly by 0.2% per decade, with an average of 72.03% and a confidence range of 71.86 to 72.19%. By 2050, relative humidity is expected to drop to 71.82%.

Stung Treng is projected to experience significant warming. Maximum temperatures are expected to rise by 0.2176°C per decade, with an average of 33°C for 2015–2035 and a confidence range of 32.74 to 32.93°C, remaining at 33°C by 2050. Mean temperatures are projected to increase by 0.22°C per decade, averaging 28.59°C, with a confidence range of 28.5 to 28.69°C, and reaching 28.88°C by 2050. Minimum temperatures are also expected to rise by 0.22°C per decade, with an average of 24.38°C and a confidence range of 24.29 to 24.46°C, reaching 24.65°C by 2050.

Extreme heat conditions are projected to intensify in Stung Treng. Warm spell durations are expected to increase significantly by 16.27 days per decade, with an average of 30.1 days annually and a confidence range of 26.35 to 33.85 days, reaching 45.01 days by 2050. Days exceeding 25°C are projected to remain nearly constant at 364.97 days by 2050. Hot days (above 35°C) are expected to rise significantly by 8.49 days per decade, averaging 73.37 days annually and reaching 82.63 days by 2050. Extremely hot days (above 40°C) will remain rare but are projected to increase slightly, reaching an average of 0.03 days by 2050.

Peak single-day temperatures are expected to rise by 0.27°C per decade, averaging 38.97°C annually and reaching 39.34°C by 2050. Tropical nights (nights above 20°C) are projected to increase significantly by 1.79 nights per decade, averaging 347.73 nights annually, and reaching 350.86 nights by 2050. The lowest daily temperatures are expected to rise by 0.24°C per decade, averaging 16.92°C and reaching 17.19°C by 2050.



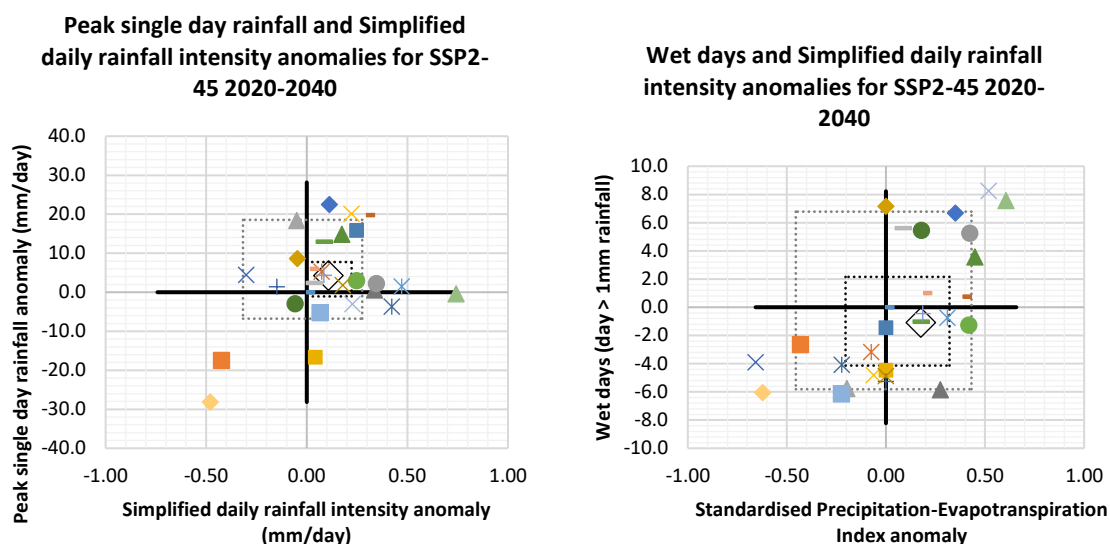


Figure 2-28. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

### Takeo

Takeo is projected to experience an increase in annual rainfall, with a statistically significant trend of 0.45% per decade (6.55 mm/decade). The mean annual rainfall from 2015 to 2035 is 1,469 mm, with a confidence range of 1,454.15 to 1,484.7 mm, and it is expected to rise to 1,481 mm by 2050. Days with rainfall exceeding 20 mm are projected to increase significantly by 0.11 days per decade, averaging 3.51 days annually, with a confidence range of 3.25 to 3.77 days. Days with rainfall exceeding 50 mm are expected to remain at an average of 0 days, with no significant change.

Extreme rainfall events are also expected to intensify. Single-day peak rainfall is projected to increase significantly by 0.24 mm/decade, averaging 28.28 mm annually, with a confidence range of 27.56 to 29 mm. The five-day peak rainfall magnitude is expected to rise by 0.59 mm/decade, averaging 85.31 mm, with a confidence range of 83.45 to 87.18 mm. The largest monthly cumulative rainfall is projected to increase significantly by 1.47 mm/decade, with an average of 284.59 mm and a confidence range of 280.63 to 288.55 mm.

The drought index (SPEI) is projected to improve significantly by 0.03 SPEI/decade, suggesting fewer severe droughts. The average SPEI value is -0.07, with a confidence range of -0.15 to 0. Consecutive dry days are expected to decrease slightly by 0.02 days per decade, averaging 28.42 days annually, though this trend is not statistically significant. Consecutive wet days, however, are projected to decrease significantly by 0.88 days per decade, with an average of 89.32 days and a confidence range of 86.18 to 92.46 days.

Relative humidity is expected to decrease significantly by 0.12% per decade, with an average of 72.31% and a confidence range of 72.18 to 72.44%. By 2050, relative humidity is projected to decline to 72.19%.

Takeo is expected to experience significant warming. Maximum temperatures are projected to rise by 0.2011°C per decade, with an average of 33°C for 2015–2035 and a confidence range of 32.83 to 33.01°C, remaining at 33°C by 2050. Mean temperatures are projected to increase by 0.2°C per decade, averaging 28.98°C, with a confidence range of 28.9 to 29.06°C, and reaching 29.24°C by 2050.

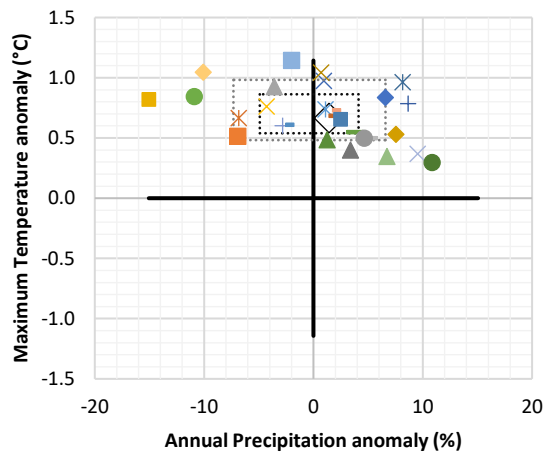


Minimum temperatures are expected to rise by 0.21°C per decade, with an average of 25.05°C and a confidence range of 24.97 to 25.14°C, reaching 25.33°C by 2050.

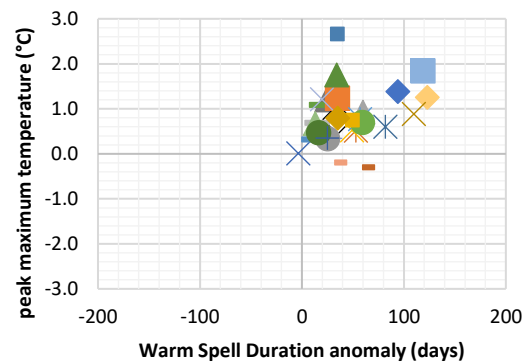
Extreme heat events are projected to intensify in Takeo. Warm spell durations are expected to increase significantly by 22.67 days per decade, with an average of 37.64 days annually and a confidence range of 31.19 to 44.1 days, reaching 58.15 days by 2050. Days exceeding 25°C are projected to remain constant at 365 days by 2050. Hot days (above 35°C) are expected to rise significantly by 10.04 days per decade, averaging 49.4 days annually and reaching 61.7 days by 2050. Extremely hot days (above 40°C) are expected to remain at 0 days.

Peak single-day temperatures are expected to increase by 0.25°C per decade, averaging 37.22°C annually and reaching 37.52°C by 2050. Tropical nights (nights above 20°C) are projected to increase significantly by 0.55 nights per decade, averaging 361.46 nights annually and reaching 362.2 nights by 2050. The lowest daily temperatures are projected to rise by 0.22°C per decade, averaging 19.33°C and reaching 19.57°C by 2050.

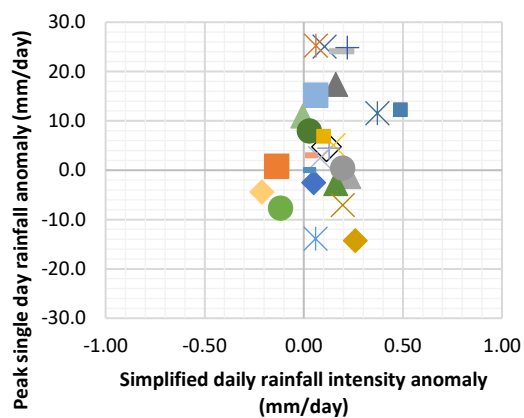
**Average temperature and Precipitation anomalies for SSP2-45 2020-2040**



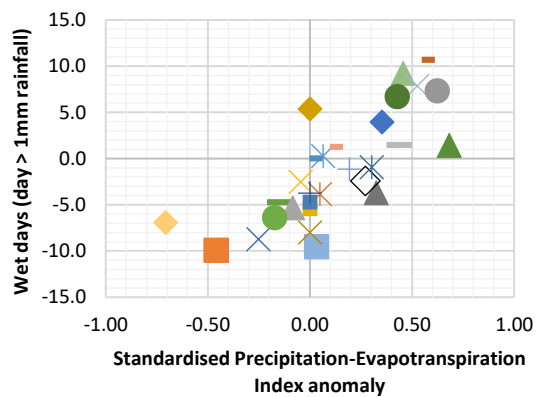
**Warm Spell Duration and peak maximum temperature anomalies for SSP2-45 2020-2040**



**Peak single day rainfall and Simplified daily rainfall intensity anomalies for SSP2-45 2020-2040**



**Wet days and Simplified daily rainfall intensity anomalies for SSP2-45 2020-2040**



*Figure 2-29. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

## Data utilised

Climate data was based on the CMIP6 SSP2-4.5 climate scenario. The CMIP6 project expands on previous phases of the Coupled Model Intercomparison Project (CMIP), which have provided valuable information on the past and future evolution of the Earth's climate system. This analysis is based on CMIP6 data, which includes 134 models from 53 modelling centres. The publication of CMIP6 data began in 2019, with the majority of the data by 2022, with CMIP6 scientific analyses used in the IPCC's 6th Assessment Report (AR6).<sup>127</sup>

- WorldClim: WorldClim data is a set of bias-corrected, high-resolution, downscaled climate models that can be used for detailed spatial analysis of an area's climate changes. The data used has a downscaled resolution of ~10km and presents a temporal average of the climate from 2021-2040 representing the near-term projection.<sup>128</sup>
- The Climate Change Knowledge Portal (CCKP): the CCKP is a hub for climate-related information, data, and tools which provides an online platform from which to access and analyse comprehensive data related to climate change and development. The data used has a downscaled resolution of ~50km and presents a temporal average of the climate from 2020-2039 representing the near-term projection.<sup>129</sup>
- Copernicus Climate Change Service (C3S): This dataset provides aridity indicators useful for climate and vegetation interaction assessment.<sup>130</sup>
- Köppen-Geiger climate classification: Maps present global maps of the Köppen-Geiger climate classification at a high resolution for historical and future climate conditions. The data used has a downscaled resolution of 1km and presents a temporal AVERAGE of the climate from 2041-2070 representing the medium-term projection.<sup>131</sup>
- Climate research unit (CRU) data 4.06 release. The CRU TS dataset was developed and has been subsequently updated, improved, and maintained with support from several funders, principally the UK's Natural Environment Research Council (NERC) and the US Department of Energy. Long-term support is currently provided by the UK National Centre for Atmospheric Science (NCAS), a NERC collaborative centre.<sup>132</sup>

## 2.3 Adaptation Gaps and Adaptation Actions

The climate change impacts documented above point to the vulnerability of school children and other vulnerable community members surrounding schools, as well as school infrastructure, systems and services. It is very likely that adaptation gaps driven by climate change and a lack of coordinated and

<sup>127</sup> ECMWF, CMIP6 climate projections and information.

<sup>128</sup> Hijmans, R.J., S.E. Cameron, J.L. Parra, P.G. Jones and A. Jarvis, 2005. Very high-resolution interpolated climate surfaces for global land areas. *International Journal of Climatology* 25: 1965-1978

<sup>129</sup> World Bank Group, Climate Change Knowledge Portal (2024). URL: <https://climateknowledgeportal.worldbank.org/>

<sup>130</sup> Nobakht, M., Beavis, P., O'Hara, S., Hutjes, R., Supit, I., (2019): Agroclimatic indicators from 1951 to 2099 derived from climate projections. Copernicus Climate Change Service (C3S) Climate Data Store (CDS). DOI: 10.24381/cds.dad6e055

<sup>131</sup> Beck, H.E., T.R. McVicar, N. Vergopolan, A. Berg, N.J. Lutsko, A. Dufour, Z. Zeng, X. Jiang, A.I.J.M. van Dijk, D.G. Miralles. High-resolution (1 km) Köppen-Geiger maps for 1901–2099 based on constrained CMIP6 projections. *Scientific Data* 10, 724, doi:10.1038/s41597-023-02549-6 (2023)

<sup>132</sup> Harris, I., Osborn, T.J., Jones, P. et al. Version 4 of the CRU TS monthly high-resolution gridded multivariate climate dataset. *Sci Data* 7, 109 (2020). <https://doi.org/10.1038/s41597-020-0453-3>

well-planned investment, if left unabated, will widen, possibly drastically in a short time given the intensification of climate change hazards such as floods, drought, cyclones and heat stress described earlier. The Business-as-Usual case scenario regarding climate-related education impacts is therefore set on a future course to worsen thereby contributing to increased climate vulnerability of school children and their school facilities in addition to the overarching education system. This will likely result in devastating impacts for Cambodia including but not limited to: increased injuries, death, absenteeism, gender inequality, early forced marriages, under-development, future unemployment, school temporary/permanent closures as well as possible school relocations, degraded/broken school facilities, hazardous school settings for children and teachers, migration, child-modern slavery, inability to attract private finance in the future, inability to integrate climate and education curriculum, policies and programming, inability to provide or access local Early Warning Systems (EWS) and Climate Information Services (CIS) and inability to safeguard school children including protecting child rights and raising children's voices etc. These are a handful of knock-on effects caused by climate change and in turn, a lack of investment in climate-related education.

However, BRACE offers an alternative future through its focus and investment on climate-related education actions to address these climate hazards and gaps. The list below provides an overview of the selected interventions for Cambodia that address the adaptation gaps through climate action.

To identify the adaptation gaps and actions, the team looked at:

- The climate vulnerability, which is a function of exposure to climate variability and hazards, sensitivity to that variability and those hazards, and the adaptive capacity of habitats, ecosystems, populations and/or social structures
- The climate change driver, hazards, vulnerabilities and impacts
- Existing and planned projects.

Building on the Comprehensive School Safety Framework, exposure, sensitivity and adaptive capacity gaps will be identified with regards to:

- a. Enabling systems and policies
- b. School facilities
- c. School safety and educational continuity management systems and
- d. Embedding of climate change in education.

### **Enabling systems and policies**

As demonstrated above, Cambodia has a number of policies and guidelines for climate change and the education sector. Nonetheless, there are still challenges with regards to coordination between climate change and education government departments and partners, as well as implementation of the policies and plans, as well as the lack of a dedicated education and climate change plan. To address these gaps, the project suggests to undertake the following activities:

- Support multi-stakeholder coordination platforms bringing together education and climate actors in Cambodia
- Development of a climate and education framework for Cambodia.

### **Vulnerability of school facilities to climate-related risks**

School infrastructure in Cambodia faces a number of adaptation gaps:

- School locations and surrounding exposed to climate-related hazards as well as unsafe structures
- Remoteness and isolation of schools
- Poor general maintenance and building conditions leading to unsafe school infrastructure
- Unsafe surroundings
- Lack of access to clean and high-quality water and electricity

- Little/no investments to improve school infrastructure and surroundings

These adaptation gaps lead to high level of risk for the students in the schools as well as high potential for damage and high recovery costs from the climate-related hazards identified above.

The MoEYS has indicated strong interest in ensuring school facilities are climate resilient. There has been progress on climate-resilient infrastructure in Cambodia, but not in relation to the education sector. For example, in 2019, the Ministry of Public Works and Transport, and the National Council for Sustainable Development (part of the Ministry of Environment) released a green infrastructure guide. The development of the guide was funded by the Climate Investment Funds through the Asian Development Bank, with technical assistance provided by the International Centre for Environment Management. The guide is not specific to education but does include guidance to Cambodia for green infrastructure. In relation to urban infrastructure, it includes sections on water and flood management (including drainage corridors, rainwater harvesting, and urban river terracing), pollution management (bioretention pond, bioswales, greywater recycling and rain gardens), and energy, heat and greenhouse gas management (green roofs and walls and urban tree canopies). To tackle the adaptation gaps, the project will undertake the following interventions:

- Support the MoEYS to prepare national guidelines on climate-resilient school infrastructure, including WASH facilities
- Retrofit school infrastructure, including WASH facilities
- Provide training to children on hygiene
- Provide training to school management committees and local government administrations on how to maintain the climate-resilient school infrastructure.

### **School safety and educational continuity management systems**

There is a strong need for school safety and educational continuity management in schools across Cambodia, including child protection. Cambodia has made significant progress in implementing school safety and educational continuity management. For example, in 2023 the MoEYS, with support from development partners, updated and launched the national School Safety Guidelines to align it with the new Comprehensive School Safety Framework 2022-2030, but the roll-out and coverage of these systems and tools has been limited. Similarly, during consultations during the BRACE design it was raised that schools do not always have the resources to implement disaster plans, and schools lack access to early warning systems. The national preparedness and response plan in the education sector was developed in 2013 and revised in 2019. However, there is a gap in the revision to and development of the early warning system in the education sector, with low budget investment, limited coordination across sectors, and low capacity to ensure education continuity during a climate shock. Preparedness in schools is limited due to the low capacity of teachers and operationalization at the national level.

### **Climate change embedded in education**

Investments to embed and integrate climate change in the Cambodian curriculum have occurred. However, consultations with MoEYS and other partners point to the fact that the curriculum is already overloaded. Instead, it is preferable to have climate change as a topic within the Local Life Skills Curriculum, implemented through child clubs in schools and communities.

The following adaptation gaps were identified:

- Lack of mentoring and support to teachers on how to infuse climate changes lessons and activities throughout the curriculum
- Lack of guidance for child clubs on how to implement climate change.

## **2.4 Project description**

The BRACE project aims to strengthen the climate resilience of the education sector by helping to reduce and avoid significant impacts on educational assets, children, and access to learning. This will be achieved through ensuring that enabling systems and policies are in place, supporting the

development of education and climate change policies and guidelines, strengthening coordination, and facilitating integration of the DRR into existing and new school plans. The programme will ensure that the school facilities are safe through investments in strengthening the physical resilience of school infrastructure and ensuring that school safety and educational continuity management systems are in place and operating effectively. To improve climate and disaster resilience planning in the education sector, the project will also work with schools and the education sector to improve accessibility to climate information and e-learning, and promote preparedness through training and materials which will be designed to be appropriate to the local context.

### Theory of change

**Impact:** IF the education stakeholders in Cambodia are better informed of climate risks and adaptation options for the education sector, as well as have access to global knowledge, policy exchange and financing, and IF the target schools are teaching children about climate change and become safer and greener, THEN the school systems of the target countries and beyond, including children and communities, become more resilient, BECAUSE, policies of the education sector becomes more responsive to climate change, there will be increased climate finance for the sector, Ministry of Education staff, students and communities will become more knowledgeable and engaged in climate adaptation actions and advocacy.

**Key barriers** in Cambodia that prevent the education sector from adequately addressing the main climate drivers are:

**Governance:** Lack of resources and capacity for effective enabling environment and institutional governance for climate action in education sector.

**Social:** No culture of resilience in educational institutions reduces uptake of available resources.

**Informational:** Limited access to relevant, high quality climate information for decision making in the education sector.

**Technological:** Low level of technical expertise with limited availability to support effective action.

**Institutional:** No central and interconnected 'home' for coordinating approaches and ensuring cross-learning.

**Gender and social inclusion:** Significant inequalities in access and educational attainment for girls and children with disability.

**Underlying assumptions** of the project are:

- Multiple project areas will not be affected simultaneously by significant climate-related and non-climate disasters (e.g. category 5 cyclone, wave action, flood, drought, heatwave, tsunami, earthquake, etc.) during implementation
- Government implementing partners will remain committed to the project throughout the implementation period
- Relevant government departments will facilitate project access to national CIS and EWS systems

- Targeted schools and school staff will remain committed to the project throughout the implementation period.

## **Project Outcomes, Outputs and Activities**

### **Outcome 1: Increased climate resilience of the education sector and its stakeholders at the national and sub-national levels**

Output 1.1: Enabling systems and policies are in place and supported

**Activity 1.1.1:** Facilitate preparation and endorsement of climate and education policies, plans and guidelines

Sub-Activities:

- 1.1.1.1 a Establish National Climate Resilience in Education Framework.
- 1.1.1.2.a Implement climate change adaptation and environmental sustainability strategies developed by CSESI.
- 1.1.1.3.a Establish Anticipatory Action Funding Mechanism and Guideline linked to existing social protection and MoEYS.
- 1.1.1.4.a Generate evidence on the climate finance adaptation gap to support education sector policy recommendations and best practices.
- 1.1.1.5.a Conduct annual review of climate-related education budget allocations from national to sub-national levels.

**Activity 1.1.2:** Strengthen coordination on climate change within Ministries of education and other relevant line ministries at national and sub-national level

**Sub-activities:**

- 1.1.2.1. a Re-establish the functioning of the Disaster Management Secretariat and the Disaster Management Mechanism of MoEYS.
- 1.1.2.2.a Establish and strengthen a sharing and coordination platform for the relevant Ministries on climate-smart education systems for sub-national and national government levels.
- 1.1.2.3.a Comprehensively map existing policies and key stakeholders in climate-resilient education to support operationalization of BRACE.
- 1.1.2.4.a Establish Annual Multi-stakeholder dialogue on inclusion, climate change, disaster risk, and environmental safeguarding in the education sector and community of practices.
- 1.1.2.5.a: Integrate climate-resilient education initiatives into MoEYS existing annual Operations Plan.
- 1.1.2.6.a Facilitate the development of agreed recommendations by INGOs/CSOs on climate issues in education, in support of local school communities.

**Activity 1.1.3:** Facilitate integration of DRR into existing and/or new plans with education authorities.

**Sub-activities:**

- 1.1.3.1.a Strengthen Disaster Management Mechanism at sub-national level and at targeted schools.
- 1.1.3.2.a Support POE, DOE and local administration offices in BRACE target locations to embed climate-related DRR planning into existing Emergency Preparedness and Response Plans (EPRP).
- 1.1.3.3.a As a preparedness intervention, complete a consolidated sector-wide education needs assessment tool.



1.1.3.4.a Undertake mock drills in targeted schools and simulations to test effectiveness of DRR planning under the EPRP.

**Activity 1.1.4:** Support children to participate in climate change and education policy initiatives.

***Sub-activities:***

1.1.4.1.a Create key messages and joint statements for advocacy at both school and national levels.

1.1.4.2.a Establish platforms for children to exchange and engage in child-friendly policy advocacy, connecting with existing initiatives like the Youth Debate Forum.

1.1.4.3.a Facilitate child-led campaign for appropriate budget allocations based on the findings from Sub-activity 1.1.1.4.a.

1.1.1.4.a. Collect youth voices and facilitate participation in major climate and education forums.

**Output 1.2: (CSSF Pillar 1) School facilities are safer and greener.**

**Activity 1.2.1: Develop a national standard for climate-resilient school facilities**

***Sub-activities:***

1.2.1.1.a: Review and upgrade school design standards and construction guidelines to adopt climate change and other holistic considerations linked to health, safety, sustainability and inclusive design.

1.2.1.2.a: Develop an online tool to test the climate resilience of BRACE targeted schools for integration into EMIS.

**Activity 1.2.2: Retrofit school facilities, including WASH and internet connectivity, to strengthen climate resilience**

***Sub-activities:***

1.2.2.1.a Conduct an infrastructure assessment of targeted schools to identify the priority retrofitting needs.

1.2.2.2.a Conduct a hackathon to crowdsource innovative school climate resilient solutions that are affordable and locally suitable.

1.2.2.3.a Based on the infrastructure assessment, retrofit, schools according to needs and based on a menu of options. E.g. WASH facilities.

Co-financing/World Bank : Improving Equitable Access to Quality Learning Environment. This includes supporting climate-informed construction and renovation activities.

1.2.2.4.a Organize child-friendly awareness-raising sessions for students to promote handwashing and proper hygiene.

**Activity 1.2.3: Strengthen school communities and education officials to operate and maintain school infrastructure and facilities**

***Sub-activities:***

1.2.3.1.a Provide training to school staff, SMCs and local administrators, on maintaining infrastructure, linked to implementation of the school improvement plan.

1.2.3.2.a Organize School inauguration/hand -over ceremony.

### **Output 1.3: School safety and educational continuity management systems are operating effectively**

#### **Activity 1.3.1: Build capacity of national and sub-national education officials to be master trainers on climate-related school safety**

##### ***Sub-activities:***

1.3.1.2.a Provide Training of Trainers (ToT) to MoEYS at national level on the standard framework for school-based risk reduction and adaptation.

Co-financing/World Bank : Improving School-Based Management across General Education. This includes (a) training and education for school administration and teachers, community representatives, local authority members, and subnational education officials on climate change, including lessons on local climate impacts and responses and planning for climate-resilient schools

1.3.1.3.a Sub-national training delivered by trained MoEYS master trainers to POE, DOE, and local administration.

Co-financing/World Bank : Improving School-Based Management across General Education. This includes (b) central-level SBM support to build school-specific climate resilience.

#### **Activity 1.3.2: Build knowledge and capacity of school management, teachers and children to prepare school climate-related school safety plans**

##### ***Sub-activities:***

1.3.2.1.a Strengthen and/or establish the Preparedness and Response system and function in targeted School Management and SMC.

1.3.2.2.a Provide training to school management (teachers) and SMCs (including community) on how to implement the school-based risk reduction and adaptation framework.

Co-financing/World Bank : Training and Upgrading Teachers and School Principals. This includes (a) helping improve climate knowledge for disaster preparedness among teachers and school administrators who are responsible for imparting climate education to their students and (b) developing capabilities for teachers and school administrators to conduct remote learning/e-learning.

1.3.2.3.a Support and operationalize climate-linked Psychological First Aid in schools.

#### **Activity 1.3.3 Prepare and implement school-level climate-related school safety plans**

##### ***Sub-activities:***

1.3.3.1.a Work with the student council and the SMC on the climate-hazard risk assessment (including child protection).

1.3.3.2.a Develop a climate-related school safety plan from the climate-hazard risk assessment linked to school improvement plan, commune investment plan, and EPRP (DRR planning).

1.3.3.3.a Local schools implement activities identified in the climate-related school safety Plan.

1.3.3.4.a Conduct annual participatory school-level risk assessment, and update climate-related school safety plans.

1.3.3.5.a Provide mentoring support to school management and additional refresher training to SMCs.

### **Activity 1.3.4 Provide climate resilience tools, equipment and kits to schools**

#### ***Sub-activities:***

1.3.4.1.a Provide DRR/CCA tool kits and materials for targeted schools and SMC.

### **Activity 1.3.5 Strengthen access to and use of Early Warning Systems (EWS) and Climate Information Systems (CIS) in schools**

#### ***Sub-activities:***

1.3.5.1.a Support EMIS to integrate the climate and child protection indicator at school level.

1.3.5.2.a Prepare a dashboard, linked to UNICEF CCRI and risk mapping from the National Committee for Disaster Management prepared by WFP.

1.3.5.3.a Support the education sector to prepare an agreed trigger for climate related education linked to social protection for anticipatory action.

1.3.5.4.a Present an economic analysis to the Ministry of Economy and Finance based on projections of climate impact and the adaptation finance gap on the education sector.

1.3.5.5.a Develop online platform (i.e. Chatbot) and offline platform with audio and information to translate early action early warning to targeted schools.

1.3.5.6.a Establish and implement a School Early Warning System in collaboration with the NCDM, MoE and the MoEYS.

1.3.5.7.a Conduct a campaign on education learning continuity focused on climate adaptation and shocks.

### **Output 1.4: Climate change resilience teaching and learning embedded in national systems**

#### **Activity 1.4.1 Develop teaching and learning materials on climate change ready to implement through national, non-formal and informal curriculum**

##### ***Sub-activities:***

1.4.1.1.a Initial assessment to agree additional climate-related green generation content and materials (topics might include green skills, child protection and child rights).

Co-financing/UNICEF: Develop soft skills assessment tools for classroom teachers and integrate these into the inspection system.

1.4.1.2.a Develop additional quality learning materials and modules, linked to specific climate and environmental solutions.

1.4.1.3.a Develop climate-sensitive PFA training package for school education, student council, SMC and community leader.

1.4.1.4.a Support the roll-out of the teacher training module and curriculum review conducted by UNESCO through CSEI.

#### **Activity 1.4.2 Build knowledge and capacity of teachers and education managers to implement climate change lessons inside the classroom**

##### ***Sub-activities:***

1.4.2.1.a Enhance pre-service and in-service teacher capacity to deliver climate resilient module and green generation activities in the classroom, including project-based learning, and child-led learning.

Co-financing/UNICEF: Capacity building for TEC and RTTCs director and trainers including cooperative schools on green skills focused LSE Program.

Sub-activity 1.4.2.2.a Conduct a follow up training on how to integrate climate resilient module and green generation activities into routine instruction in the classrooms.

Co-financing/UNICEF: Capacity building for district officials, principals, and teachers to support the implementation and scale-up of green skills focused LSE programmes at the school level, with a focus on Women (70 primary and 30 lower secondary schools).

1.4.2.3.a Establish a virtual professional community of practice on climate resilience for green generation facilitators.

1.4.2.4.a Working with the existing mentoring programme developed by MoEYS, embed green generation materials for coaching and mentoring support.

Co-financing/UNICEF: Development of a mentoring system to support the implementation of LSE at the school levels, with a focus on women (5 districts in 5 provinces).

1.4.2.5.a Provide training on the climate-related PFA to teachers and peer student.

1.4.2.6.a Establish comprehensive Peer-to-Peer Support and Community-Linked Safe School Initiative.

#### **Activity 1.4.3 Strengthen capacity of child clubs to lead climate change initiatives in their school and community**

##### ***Sub-activities:***

1.4.3.1.a Build in climate resilience into existing guidelines for child clubs and develop a TOR linked to Student's Councils to clarify mandate and roles.

1.4.3.2.a Training and on-going coaching and mentoring to assigned teachers who will act as facilitators to the Student's Councils, including local government.

1.4.3.3.a Capacity building to the child clubs, including how to strengthen club functioning to undertake environmental education campaigns and other activities in the school and community.

1.4.3.4.a Support child-led initiatives related to climate and education inclusive of community for scale-up with GPE target areas.

1.4.3.5.a Develop mentoring and coaching support to child clubs and student council.

1.4.3.6.a Develop and increase access to child-centred materials to support child clubs implement their activities in the school or community.

#### **Activity 1.4.4 Disseminate climate change teaching and learning materials through Ministry of Education e-learning and other platforms**

##### ***Sub-activities:***

1.4.4.1.a Integrate green generation materials into MoEYS online platform to support scale-up to other teachers in Cambodia.

Co-financing/UNICEF: Integration of green skills focused LSE into pre-service teacher training programs for both primary and secondary educations (10 teacher training colleges).

1.4.4.2.a Work with teachers, and education authorities in each targeted district to support continued embedding of climate change into classroom instruction.

#### **Activity 1.4.5 Prepare learning documents and hold events with Ministries of Education and other partners to share experience of integrating climate change into the curriculum**

### **Sub-activities:**

1.4.5.1.a Document and share with MoEYS, and other actors how to integrate climate change and environmental content in the classroom context.

## **2.5 Technical assessment**

This section includes evidence of the effectiveness of the proposed activities.

### **Use of model green school as a means of replicating and scaling up good practices in Cambodia**

The concept of a model green school in Cambodia is a transformative approach that integrates environmental sustainability into the educational framework. It serves as a blueprint for replicating and scaling up good practices across the country. The success of this approach relies on the ability of model Green Schools to demonstrate the benefits of sustainability, influence policy, and inspire other educational institutions to follow suit.

The model green school initiative is grounded in evidence-based practices that focus on four core areas: school governance, facilities and operation, teaching and learning, and community engagement. These areas are crucial for integrating sustainability principles and climate action into the school culture. The Eco-School Program in Cambodia offers a set of criteria for schools to become eco-friendly, including waste management, climate change education, water and energy saving, sanitation, and food safety<sup>133</sup>.

The global Greening Education Partnership (GEP) launched the green school quality standard in June 2024<sup>134</sup>, which outlines a global target of greening at least 50% of schools in all countries by 2030. The green school quality standard was developed in collaboration across more than 450 organisations, and provides a common language and agreed best practices for stakeholders to work towards creating climate-ready and green schools.

Model green schools can facilitate the replication and scale up of good practices through;

- **Demonstration and Inspiration:** Model green schools showcase best practices in action, serving as a source of inspiration for other schools. They demonstrate how sustainability can be embedded in school governance, operations, curriculum, and community interactions.
- **Professional Development and Training:** Model green schools provide training and professional development opportunities for educators from other schools. By sharing their expertise and experience, they help others to develop necessary skills for implementing green practices.
- **Resource Sharing:** Resources developed and tested in the model green schools, such as teaching and learning materials, policy templates, and case studies, will be shared and can be adapted and applied by other schools
- **Networking:** By creating a network of green schools, model institutions can facilitate the exchange of ideas and experiences. This network can act as a community of practice platform and as a support system for schools that are in the early stages of their green journey.
- **Research and Development:** Model green schools will be centers for research and innovation, continuously exploring new ways to improve sustainability in education and ideas, lessons and learning will be disseminated to a broader audience.
- **Policy Advocacy:** Successful model green schools will influence policy by providing evidence of the benefits of green practices. This will influence replication and the adoption of supportive policies and increased funding for green initiatives in education.

<sup>133</sup> <https://cambodia.vvob.org/en/download/eco-school-handbook-implement-green-school-guidelines>

<sup>134</sup> <https://www.unesco.org/en/articles/green-school-quality-standard-greening-every-learning-environment>

- **Community Engagement:** As hubs of sustainability within their communities, model green schools engage local stakeholders in sustainability efforts, creating a ripple effect that extends beyond the school itself.
- **Monitoring and Evaluation:** Effective monitoring and evaluation strategies will be implemented to measure and document the impact of the green practices in the model green schools. These strategies will be shared with other schools to help them track progress and support the culture of data-driven decisions.

To effectively replicate and scale up the good practices from model green schools, it is essential to have a clear framework for collaboration, knowledge exchange, and continuous improvement. This will involve regular communication, sharing of success stories and challenges, and collaborative problem-solving with government stakeholders at local and national level as well as school leaders, teachers and community members. The model green school standard in Cambodia provides a structured approach that schools can adapt and adopt, ensuring that the replication of practices aligns with the Government's overarching goals of sustainability and climate readiness.

In Cambodia, the Ministry of Education has set five standards for public primary schools to attain model status, which includes student performance, teaching effectiveness, community participation, operational management, and school accountability. The evidence base for the model green school in Cambodia suggests that such an approach can lead to improved educational outcomes, increased environmental awareness, and enhanced community involvement. By adopting these standards, schools become catalysts for sustainable development, preparing students to address climate challenges and contribute to a more sustainable society. The success of this initiative in Cambodia can inspire similar efforts globally, demonstrating the potential of education as a powerful tool for environmental stewardship and social change<sup>135</sup>.

### **Retrofit and rehabilitate model schools to make them more climate-resilient**

Retrofitting and rehabilitating model schools to enhance their climate resilience directly addresses the critical vulnerabilities of school infrastructure to climate-related hazards. In 2018, Save the Children's Early Childhood Care and Development for Floating Villages project, funded by a grant from the World Bank-administered Japan Social Development Fund (JSDF), successfully constructed floating school infrastructure. This included both on-shore and off-shore buildings designed to enhance adaptation and resilience to disasters. The retrofitting and reconstructed school buildings enable remote and marginalized students to access education. In 2021, Save the Children Cambodia also played a crucial role in rehabilitating and improving floating schools of communities around the Tonle Sap Lake under the Generating Resilient Environments and Promoting Socio-Economic Development of the East Tonle Sap Lake (GREEN). Floating schools in this region are particularly vulnerable to seasonal flooding and extreme weather events, which can disrupt education and pose significant risks to students and teachers. The school rehabilitation efforts aim to make the infrastructure much safer for children, ensure education continuity, and enhance resilience to hydro-meteorological hazards. Additionally, Save the Children has implemented measures to improve the learning environment and resources available in these schools. This includes providing waterproof storage for educational materials, enhancing classroom facilities, and training teachers on disaster preparedness and response. These efforts ensure that education can continue uninterrupted, even during adverse weather conditions. The success of these initiatives is evident in the increased safety and resilience of the floating schools, which now provide a more stable and secure learning environment for children.

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<sup>135</sup> <https://educationcambodia.org/transforming-education-ministry-unveils-model-school-standards/22006/>





***Floating and offshore flood adaptation school constructed by Save the Children Cambodia***

Examples of evidence from similar contexts that support this approach is the Philippine Department of Education's retrofitting efforts for public schools, under its School Building Programme. Initially a part of its recovery efforts following the Typhoon Haiyan (Yolanda) in 2013, this initiative aimed to rebuild and strengthen public school infrastructures to be more resilient to impacts of different hazards. The retrofitting involved reinforcing structures to withstand strong winds, earthquakes and floods, including upgrading the structural integrity of the buildings, enhancing foundations, and improving roofing systems to prevent storm damage. Additionally, the programme focused on ensuring that schools could serve as safe havens or evacuation centres during emergencies. The effectiveness of these measures is evident in subsequent typhoons where retrofitted schools sustained less damage and provided safe shelters for communities. This strategy also highlighted the importance of resilient infrastructure in mitigating the impacts of different natural hazards and ensuring the continuity of education with minimal disruption during emergencies.

### **School safety management**

Evidence from school safety management initiatives in countries like Indonesia, Laos, Myanmar, the Philippines, and Thailand under the ASEAN Safe Schools Initiative (ASSI) highlights the success and impacts of school safety management programmes. In Laos, the establishment of school disaster management committees and the development of a school safety self-assessment tool led to significant increase in the school stakeholders' ability to plan and implement strategies to address school risks and respond effectively to emergencies. The project's target schools reported marked improvement in the students' and staff's awareness and preparedness for disasters or emergencies.

Similarly, in Myanmar, schools developed robust emergency response plans and strengthened community engagement in disaster preparedness, leading to more effective responses to emergencies. In the Philippines, Thailand, and Indonesia, ASSI-supported programmes focused on multi-hazard risk assessments and school-based disaster management plans. Regular drills and simulations involving students, teachers, and parents have fostered a culture of preparedness, improved school safety and building resilient communities better equipped to handle climate-related hazards.

In Cambodia, previous ASSI projects have shown promising results in enhancing school safety and resilience. Schools involved in these initiatives have developed comprehensive school safety plans, conducted regular drills to prepare for climate-related hazards, and improved their infrastructure to withstand impacts of hazards such as floods and storms. The establishment of school safety committees has also been instrumental in fostering a culture of preparedness and continuous improvement. These successes underscore the potential benefits of expanding and sustaining school safety management efforts in Cambodia to safeguard educational continuity and protect lives amidst climate-related challenges.

## Implement Green Generation with teachers and children

Through several large-scale children's consultations conducted as part of Save the Children's global campaign, 'Generation Hope'<sup>136</sup> children clearly express an urgent desire to learn about climate change and environmental preservation, and that they want to practice their right to participation through taking part in climate actions. And they want it now.

SC supports child and youth activism at a system level, through contributing to curriculum development processes and teacher professional development for transforming the pedagogical approach to more project-based/enquiry-based teaching and learning methods which is demonstrated to be more effective for climate change and environmental education<sup>137</sup>. However, in parallel to contributing to the lengthy system change processes, Green Generation offers *immediate action* at school and community levels to create opportunities for children and youth to learn about climate change and the environment. This comes as a supplemental learning opportunity through both non-formal/ extra-curricular activities and as integrated sessions in regular classroom teaching, bridging the current gap in the curriculum and teachers' competencies.

Green Generation<sup>138</sup> was first developed and tested in collaboration between World Wildlife Fund and SC in Myanmar. It was proven as an effective means of raising awareness among children, teachers and the school community on local environmental challenges and promoting caring behaviour towards nature and the environment. Since 2021, the Green Generation model has been replicated, contextualized and translated for several additional countries, including Cambodia, Guatemala, Palestine, Syria, and Lebanon<sup>139</sup>.

The global 'greening curriculum guidance'<sup>140</sup> which was launched in 2024 by the Green Education Partnership provides universal guidance for curriculum development processes towards achieving the global objective of having 90 per cent of all countries include climate change in their curricula by 2030. It identifies four key principles which underpin the design and delivery of greening education in formal, non-formal and informal settings; **Action oriented**: Content, delivery and learning activities should be empowering, learner-centred, career-related and transformative; **Justice promoting**: Climate change and environmental education should be based on a human rights approach, promoting gender equality and inter-generational as well as intra-cultural equity; **Quality content**: The content needs to be scientifically accurate, convey the urgency, be age-appropriate and indigenous influenced and balanced; **Comprehensive and relevant**: Climate change and environmental education is a continuing, life-long learning process which starts at an early age and builds on previous learning. The content needs to be culturally relevant and context appropriate as well as inclusive and institution wide, integrated throughout the learning environment.

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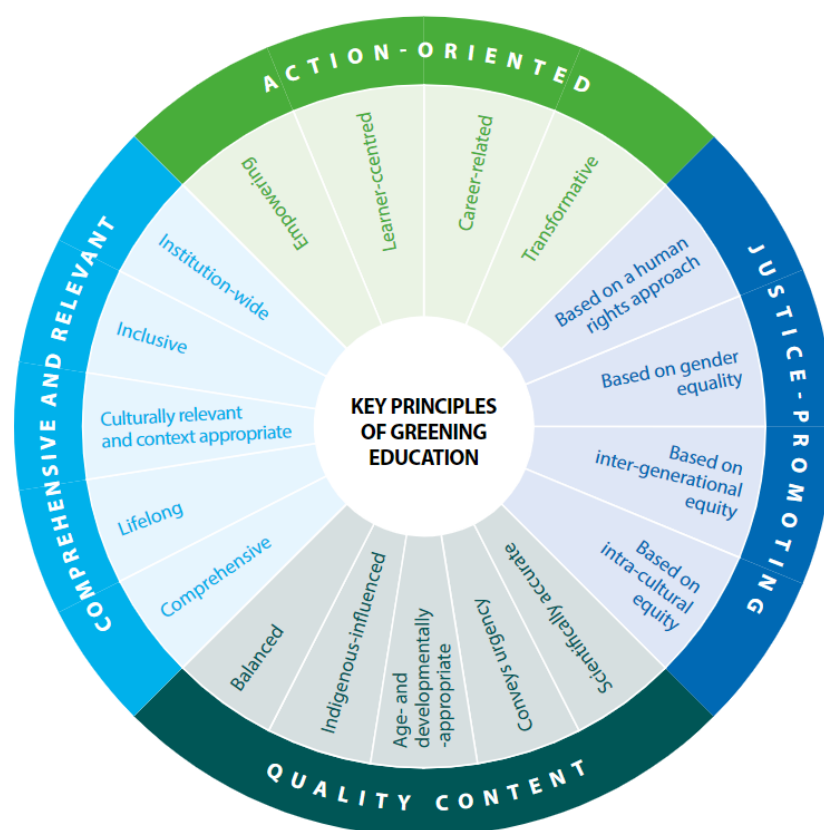
<sup>136</sup> <https://resourcecentre.savethechildren.net/document/generation-hope-2-4-billion-reasons-to-end-the-global-climate-and-inequality-crisis/>

<sup>137</sup> <https://unesdoc.unesco.org/ark:/48223/pf0000390022>

<sup>138</sup> Green Generation offers project-based climate change and environmental education with the aim of supporting; 1.Child-led climate change and environmental actions in the school and communities, 2.Promote caring attitudes and sustainable behaviour towards the environment, 3.Encourage preservation of natural resources, 4.Through the activity/ enquiry-based pedagogy, strengthen 21st century skills development like leadership, critical thinking, collaboration, mobilisation, communication.

<sup>139</sup> [https://resourcecentre.savethechildren.net/document/green-generation-concept-note/Green Generation Annual Report Myanmar.docx](https://resourcecentre.savethechildren.net/document/green-generation-concept-note/Green%20Generation%20Annual%20Report%20Myanmar.docx)

<sup>140</sup> <https://unesdoc.unesco.org/ark:/48223/pf0000390022/PDF/390022eng.pdf.multi>



The Green Generation teaching and learning material responds to the principles defined in the Greening Curriculum Guidance. It also aligns with the recommended pedagogical approach for education for sustainable development, climate change and environmental education, in terms of being learner-centred, facilitated for active, experiential, and participatory learning, and applied in project-based approaches.

Existing literature on education for sustainable development and climate change includes theoretical and empirical treatment of pedagogy. Approaches include learner-centred, active, critical, reflective, and collaborative practices. These approaches draw upon years of research of learner-centred and transformative approaches in other fields. They have been further developed in the multidisciplinary curriculum approach needed to ensure that education effectively enables learners to acquire knowledge, skills, and attitudes necessary for tackling the climate crisis. Learning outcomes that encompass all three domains of learning - cognitive, socio-emotional, and behavioural - require the use of pedagogical approaches that aim to ensure that learners take action to address climate change. Taking action is not only essential for addressing the climate crisis but also empowering and protecting learners from feelings of helplessness and prevention of climate-fatigue.

An important component of Green Generation is to facilitate real opportunities for children and youth to initiate and conduct climate and environment actions in their school and community and participate in decision making processes. To support this, Save the Children advocates with local government at district and commune level for dialogue spaces where children and their representatives can voice their needs and challenges to be addressed in, among others, the commune investment plans. Official recognition and support for children's implementation of environmental education activities and for child- and youth-led actions is crucial. The children participating in Green Generation in Cambodia have

experienced several wins based on their environmental actions and campaigns, such as funding for an improved waste management system made available on the commune council's budget (e.g. Banteay Preal, Popel, Svay Chrum, Cheu Tom, Plov Tuk, Kampong Boeng, Kampong Loung, Chhnok Tru, and Khon Rang councils) In addition, there have been behaviour shifts among parents and community members, and a significant increase among children and teachers in knowledge and awareness about climate change and environmental issues.

So far, 22 primary schools in Kampong Chhnang, Kampong Thom and Pursat Provinces have implemented Green Generation. The students demonstrated an increased understanding of environmental topics like recognizing the impacts of pollution, waste types, and the consequences of resource losses. They also understand reporting systems for environmental violations and they share their knowledge with peers, their families, and community members. In Ses Slab, Preaek Ksach, Prasat Chheang Tong, and Phat Sandai primary schools, students demonstrated proactive actions, such as collecting and burning of leaves away from their homes to prevent air pollution and avoiding littering. Parents enthusiastically confirm changes in their children's behaviour, including sharing environmental messages and adopting good hygiene practices. Students have become more aware of locally relevant environmental issues and their impacts, such as deforestation and water pollution affecting fish populations, leading to income losses. They exhibit responsible behaviour, avoiding littering, and promoting wildlife protection and deforestation prevention.

### **Mobilize child clubs to implement Green Generation initiatives in school and in the community**

Save the Children believes children's participation is not solely an activity or an event, but rather a core principle that informs our organisational behaviour. Children's participation is a crosscutting theme that permeates all aspects of the organisation and is central in our aim of strengthening the position of children and inspiring breakthroughs in the way the world treats children. It is a set of civil rights to be fulfilled, a principle to be applied and a means to fulfil other rights. Crucially, to promote and support children's participation is to meet human rights obligations and to respect children and their rights.

Save the Children has comprehensive experience in supporting non-formal after-school clubs and various forms of child clubs in different countries and contexts as an arena for supporting and encouraging children's meaningful participation in their communities, in decision making processes, and for supporting children's learning and wellbeing. The child clubs have been studied for their effectiveness in enhancing learning, and the evidence suggests that these clubs can be effective for learning by fostering an environment of both self-directed and collaborative learning, peer support, critical thinking, and active engagement with different educational material. Child clubs have been shown to improve various educational outcomes. For instance, girls' clubs in schools have led to better literacy and numeracy skills, higher school enrolment, and improved attendance rates. The clubs often provide a supportive environment where children can focus on their studies and receive additional help<sup>141</sup>.

To ensure quality child participation in 'all processes in which children are heard and participate', Save the Children has identified nine basic requirements for meaningful and ethical children's participation<sup>142</sup> across our global programmes, advocacy, and campaigns. These basic requirements are all relevant for the quality of implementation of child clubs, and defines that all children's participation activities need to be:

- **Transparent and Informative:** Children clearly understand their right to express their views and that they will be heard and valued. Children know why they are involved in a given activity,

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<sup>141</sup> [860 lessons learned from the outcomes and delivery of girls clubs in educational programmes.pdf](#)

<sup>142</sup> [basic requirements-english-final.pdf](#)

what their participation will help to achieve, and the types of decisions and plans that their participation will influence.

- Voluntary: Children have received sufficient information to understand the choices available to them, what they mean, and how to engage.
- Respectful: Children's views are treated with respect by adults and other children. They can initiate ideas themselves and express their views without fear of discrimination.
- Relevant: Children are able to draw upon their experiences, knowledge, and capabilities to express their views on issues of relevance and importance to their lives.
- Child Friendly: Children feel welcomed and are free to ask questions and raise concerns. Methods take into account children's evolving capacities, age, diversity, and capabilities.
- Inclusive: Each child is treated as an individual, and no child is discriminated against. Methods, approaches, languages, and arrangements do not exclude the most marginalised children.
- Supported by training: All adults and facilitators working with children's participation have been trained and equipped to work effectively with children.
- Safe and sensitive to risk: Risks have been identified, and clear risk management plans are in place to ensure the safe participation of children.
- Accountable: Children receive feedback on how their contribution has advised, informed or influenced developments to date.

In Cambodia the extra-curricular child clubs organised in the community, in collaboration between the school and community volunteers, have proven to be successful in terms of enhancing children's learning and well-being and facilitating for children and youth participation in advocacy processes. Child clubs provide a platform for children to participate in decision-making processes, which can foster a sense of agency and responsibility. Child clubs also often engage with the broader community, promoting children's rights and well-being, and this engagement can also contribute to a more supportive environment in general for children's growth and development.

The Child Clubs support, as part of Save the Children's programme work at the commune level, to engage and involve children in issues of child rights, child protection, advocacy, and local development processes. They provide a platform to engage children in international advocacy work through, for example, their contributions to the monitoring and reporting on the implementation of the UNCRC.

Implementation of child-led Green Generation activities in non-formal child clubs are complementary to the lessons and activities integrated in school. This reinforces learning, and provides more time and flexibility to explore the content in more depth, and initiate long-term community campaigns or community out-reach activities. It also provides opportunities for the children and youth to take on more leadership and initiatives themselves, independently of teachers or other adults.

SC's experience so far of implementing Green Generation activities in Cambodia as integrated sessions in formal school classes, and as complementary to the formal curriculum, has proven successful in terms of enhancing children's knowledge and awareness on locally relevant climate change and environmental issues. However, teachers also express challenges in terms of dedicating sufficient time for implementing the activities, especially when applying the project-based learning pedagogical methods, which require a lot of time. By also making Green Generation activities and resources available in non-formal child-clubs, children are given more time and opportunity to explore the content and activities in more meaningful ways, thereby reinforcing the learning and internalizing the messages. This is therefore a strategic programme component for strengthening impact in terms of changes in children's, their families' and communities' attitudes and behaviour towards sustainable and environmentally friendly lifestyles<sup>143</sup>.

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<sup>143</sup> [GG Project Documentation Final Draft V.6 Final.docx](#)

## 2.6 Justification

Currently, the Royal Government of Cambodia faces significant challenges in securing adequate funding and capacity to address the critical intersection of the education sector with climate risks and challenges. While there have been strides in education reform and expansion, as outlined in the Education Strategic Plan (ESP) 2024-2028, the integration of climate resilience measures within the education system remains insufficient. Both public and private sector investment in climate resilience in education is minimal, and existing donor funding prioritizes basic education without ensuring that education systems are equipped to withstand and adapt to climate impacts. Therefore, this project requests a GCF grant to finance the climate-driven intervention within Cambodia's education sector, based on a well-founded climate rationale.

Cambodia has limited access to financial resources to fund climate change mitigation and adaptation needs. Cambodia's capacity to leverage domestic public and private sector funding to meet US\$5.8 billion mitigation and US\$2 billion adaptation NDC needs largely depends on Cambodia's ability to mobilize international funding from donors.

Cambodia is highly vulnerable to climate change, facing recurrent natural disasters such as floods, droughts, and extreme weather events. These climate impacts, as detailed in the National Action Plan for Disaster Risk Reduction (NAP DRR) 2024-2028, disrupt educational services, destroy infrastructure, and displace communities, compounding existing challenges in the education sector. Despite being a low emitter of greenhouse gases, Cambodia is disproportionately affected by climate change. This creates an urgent need for targeted interventions that not only protect the current education system but also embed resilience measures to future-proof it against ongoing and future climate risks.

However, gaps remain in the prioritization of climate resilience within the education sector. The ESP 2024-2028 outlines broad goals for improving access and quality of education, but specific actions addressing climate impacts on education are limited. Furthermore, although Cambodia's Disaster Risk Reduction Plan emphasizes the need for resilience in key sectors, including education, there is insufficient integration of DRR and climate adaptation into the education system's strategic frameworks. This gap in priority setting and investment makes it imperative to secure external funding and technical support to implement a comprehensive climate-resilient education strategy.

Investing in climate resilience within the education sector in Cambodia is essential not only for safeguarding educational progress but also for promoting sustainable community practices and preparing future generations to address the challenges of climate change. This investment will not only address immediate educational needs but will also contribute to long-term national resilience, as Cambodia navigates the dual challenges of development and climate vulnerability.

The ESP 2024-2028 conducted the simulation of the funding gap.





## Funding requirement and alignment with Mid-Term Public Expenditure Framework



### Total requirement 2024-2028:

- In Riel, 2023 prices: **20,011,764** million
- In USD, 2023 prices: **4,713.0** million USD
- As share of GDP: **2.5 %**
- As share of Total public expenditure: **9.3 %**
- As share of Total public expenditure in the social sector: **38.4%**
- % of external funding: **0.32 %**

### Comparison with ceilings defined for the social sector MTPEF:

|            | million riel | distribution | distribution in social sector MTPEF |
|------------|--------------|--------------|-------------------------------------|
| Total      | 20,011,764   | -            | -                                   |
| Recurrent  | 19,465,092   | 97.3%        | 92.8%                               |
| Salary     | 14,939,453   | 74.7%        | 43.5%                               |
| Non-salary | 4,525,638    | 22.6%        | 49.3%                               |
| Capital    | 546,672      | 2.7%         | 7.2%                                |

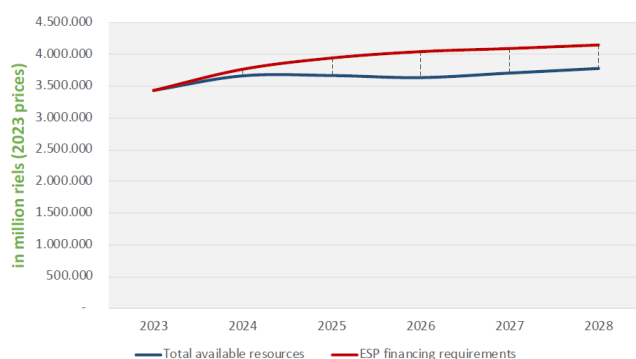
Total funding required for the period is estimated at 20,011,764 million Riel (or 4,713 million USD), which is 2.5% of GDP and 9.3% of the total public expenditure. Around 38.4% of this expenditure is allocated to the social sector, with a minimal 0.32% expected from external funding. The breakdown shows 97.3% of the funding is recurrent expenditure, with the majority going towards salaries (74.7%).<sup>144</sup>



## Funding gap

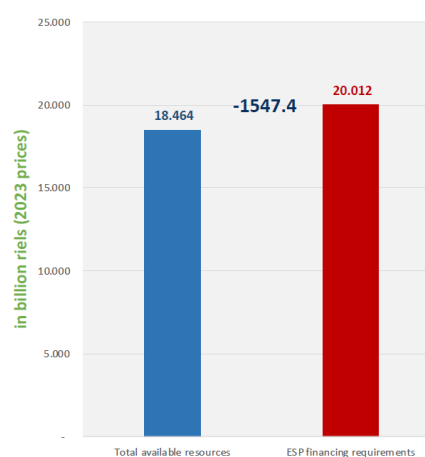


### • Funding gap by year



|                   | 2024    | 2025     | 2026     | 2027     | 2028     |
|-------------------|---------|----------|----------|----------|----------|
| Funding gap       | -68,989 | -213,902 | -343,524 | -347,164 | -370,313 |
| Percentage of gap | -1.88%  | -5.83%   | -9.44%   | -9.36%   | -9.79%   |

### • Total funding gap



Over the years, the gap increases from 68,989 million Riel in 2024 to 370,313 million Riel in 2028. The total funding gap across the period is shown as 1,547.4 billion Riel, indicating a significant shortfall between the total available resources (18.464 trillion Riel) and the ESP financing requirements (20.012 trillion Riel). This shortfall reflects increasing percentages of the gap year-on-year, ranging from 1.88% in 2024 to 9.79% in 2028, emphasizing the critical need for additional funding to meet the ESP goals.<sup>145</sup>

<sup>144</sup> Cambodia's Education Strategic Plan 2024-2028: simulation presentation Feb 19, 2024

<sup>145</sup> *ibid*

## 2.7 Geographic and Beneficiary selection

This section is informed by multi-stakeholder dialogues held during project development which are represented in Annex 7 summary of consultations and stakeholder engagement plan.

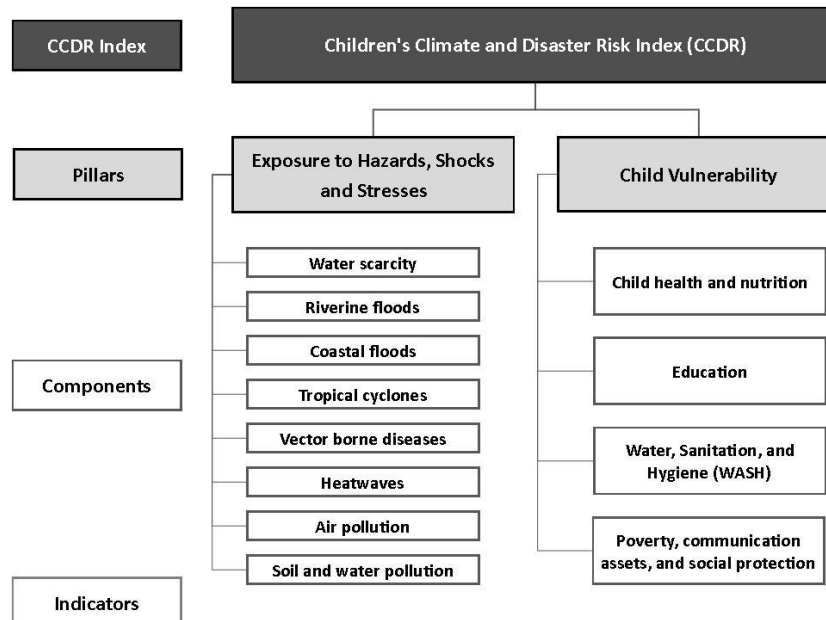
### Geographic selection

Three provinces will be selected as target provinces for this project: Kampong Chhang, Kampong Cham, and Koh Kong. At least, 240 primary schools are selected as target schools.

These provinces were selected as the geographical risks in these locations are heightened. The climate impacts on the education sector in these provinces are significant, particularly due to their vulnerability to extreme weather events, especially flooding.

The Ministry of Environment, under the technical support of the UNICEF Country's Office, recently adopted the Children's Climate Risk Index (CCRI). This newly developed risk index provides an overview of the likelihood that a wide range of natural and human shocks and stresses lead to slow development progress that affect children and vulnerable households and groups. The approach and theoretical framework of CCRI however is heavily reliant on secondary data sources, adopted from the global CCRI model, which does not reflect specific geographical areas. The global model and its components and indicators are not based on country contexts. From this perspective, there is a need to contextualise the model's results supported by country specific evidence. It is worth noting that the base year of the data is unclear given that the data validation was obtained from various sources, which pose a further limitation<sup>146</sup>.

The theoretical framework of the CCRI Model as follow:



<sup>146</sup> Under the Pillar 2 of exposure to shocks and stresses, air pollution (PM 2.5): The map of the ground-level fine particulate matter concentrations (PM2.5) is based on available data of air quality monitoring stations, which are not evenly distributed across the country. The inverse distance weighted technique (IDW) applied for the creation of the map assumes that the indicator value decreases in influence with distance from its sampled location. The average annual mean value of each air quality monitoring station is based on available annual data values for the three-year time series (2020 – 2020). Air quality monitoring stations without any data for the time series were ignored in the analysis.

**Kampong Chhnang:** This is one of the five most-affected provinces in Cambodia in relation to flooding because of its proximity to the Mekong River and Tonle Sap Lake.<sup>147</sup> The province's low-lying areas are prone to flooding during the wet season, leading to disrupted school operations, damaged infrastructure, and school closures. Flooded roads and poor infrastructure can make it difficult for students to travel to schools, leading to increased absenteeism.

**Kampong Cham:** This province is prone to riverbank erosion along the Mekong River and seasonal flooding which damages school buildings and disrupt educational activities. According to the World Food Program, Kampong Cham is listed as one of the provinces severely impacted by drought.

**Koh Kong:** As one of the wettest provinces, Koh Kong experiences severe rainfall and frequent flooding, which can damage school infrastructure, disrupt classes, and pose safety risks for students. Because of its proximity to the Gulf of Thailand, when there is a flood in Koh Kong, students always encounter difficulties to go to schools because of road damages and having to travel across rivers. Rising sea levels and coastal erosion threaten schools located near the coast, potentially leading to relocations or closures. The province is also vulnerable to tropical storms, which can cause severe damage to schools and other educational facilities.<sup>148</sup>

### Beneficiary selection

The project will develop the selection criteria for the provinces, schools, students, and adults who will be working with the project. The project will review the SCI construction policy/benchmark, MoEYS's construction guideline and target provinces/school implemented by other projects to avoid overlapping targets, thus increasing the impact. Meanwhile, the project team will be consulting the target selections with the Senior team at the MoEYS. Once the selection criteria are ready, the project team will meet with each leader of the target province for school selection, following by spot-checks to ensure that target locations and schools are adequately vetted.

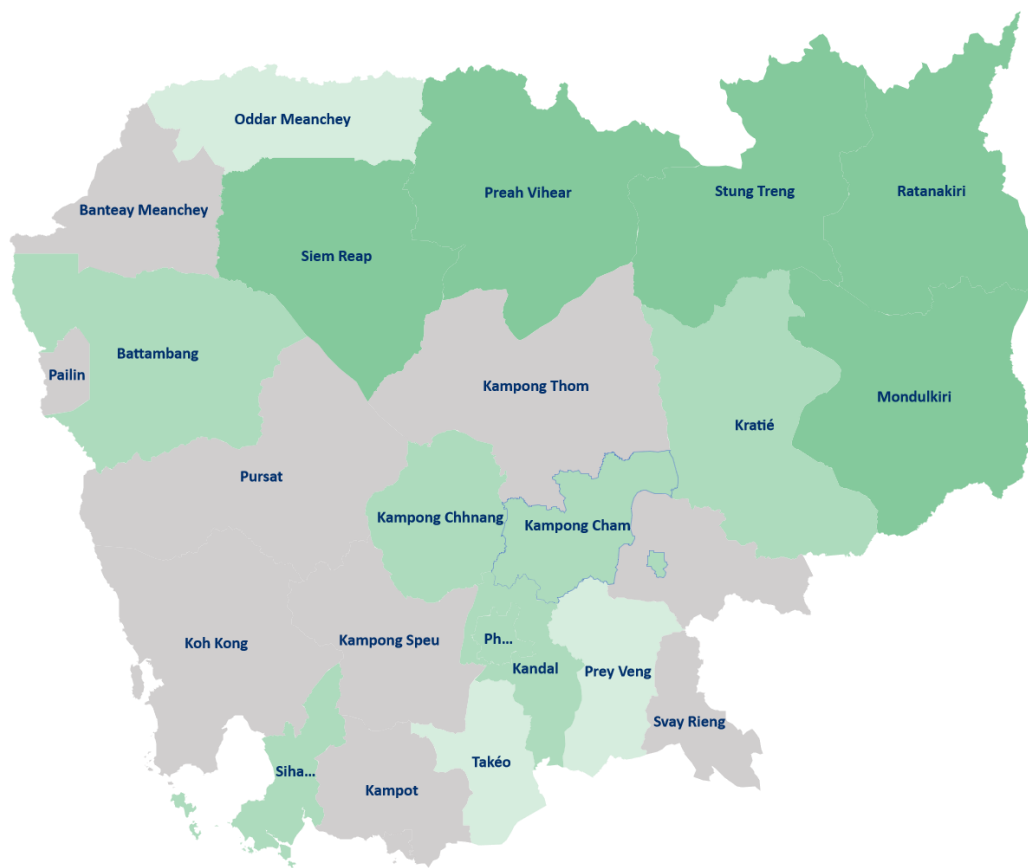
- **Direct beneficiaries:** This include both children and adults who directly receive material benefit from the project. They will include primary school children, their teachers, school principals, school management committees, education officials from Provincial/District Office of Education, Youth and Sport, local administration office staff who receive our capacity buildings and directly engage with our project activities.
- **Indirect beneficiaries** include the remaining school-aged children in Cambodia who will be affected by enabling environment improvements in the education sector.

The selection of the target is also consulted with the GPE location.

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<sup>147</sup> Impact of Disasters on the education sector in Cambodia. Available [here](#)

<sup>148</sup> *ibid*



**Map of GPE Target Provinces for Different Program Interventions (GPE V – Multiplier)**  
(Source: UNICEF and MoEYS, 2024)

Target provinces for different program interventions

| Province         | Interventions            | Province       | Interventions                                |
|------------------|--------------------------|----------------|--|
| Banteay Meanchey | No interventions         | Pailin         | No interventions                             |
| Battambang       | Inclusive Education, TEC | Phnom Penh     | Inclusive Education, TEC                     |
| Kampong Cham     | Inclusive Education, TEC | Preah Sihanouk | EGM, EGL mentoring                           |
| Kampong Chhnang  | EGM, EGL mentoring       | Preah Vihear   | Inclusive Education, MLE, EGL mentoring, LSE |
| Kampong Speu     | No interventions         | Prey Veng      | TEC  |
| Kampong Thom     | No interventions         | Pursat         | No interventions                             |
| Kampot           | No interventions         | Ratanak Kiri   | Inclusive Education, MLE. ECE/SBC, LSE       |

|                |                              |              |   |
|----------------|------------------------------|--------------|---|
| Kandal         | Inclusive Education, TEC     | Siemreap     | Inclusive Education, ECE/SBC, EGL mentoring |
| Kep            | No interventions             | Stung Treng  | MLE, ECE/SBC, EGL mentoring, LSE            |
| Koh Kong       | No interventions             | Svay Rieng   | No interventions                            |
| Kratie         | MLE, EGL mentoring, LSE      | Takeo        | TEC   |
| Mondul Kiri    | EGM, EGL mentoring, MLE, LSE | Tbaung Khmum | No interventions                            |
| Otdar Meanchey | EGL mentoring                |              |   |

Eligibility criteria for the schools selected is based on:

### 1. Climate vulnerability

Exposure to climate risks and underlying social vulnerabilities, including past climate impacts and socioeconomic conditions. Schools where the highest amount of learning loss due to school closures and/or absenteeism caused by climate-related impacts. Informed by the Ministry of Education, Youth and Sports (MoEYS) and the Ministry of Environment's Children's Climate Risk Index (CCRI) in Cambodia<sup>149</sup>.

### 2. Infrastructure condition and location

Schools with unsafe, poorly maintained, or climate-exposed infrastructure, including buildings, roofs, WASH systems, and proximity to unsafe structures (e.g. water towers, large trees). Factor in topography and site-specific risks such as low-lying floodplains, swampy terrain, or coastal exposure. Retrofitting existing school facilities only will be eligible to be included, in line with SCA's GCF Environmental and Social Safeguards (ESS) Category C accreditation.

### 3. Population and occupant capacity

Size of the community, student population, and occupant capacity of the premises. Priority given to schools with larger student populations. Considers average daily attendance and the school's suitability and capacity if used as a community shelter.

### 4. Equity and inclusivity

Schools that contain the highest proportions of students from vulnerable, disadvantaged or marginalised population groups (e.g., girls, children with disabilities, remote communities). Prioritise schools where interventions will reduce inequality and enhance inclusive access to safe, climate-resilient learning environments or emergency shelters.

### 5. Alignment with local policies plans

Consistency with national and local adaptation policies and strategies, education sector plans, or existing community disaster risk reduction frameworks. Preference given to schools designated as evacuation centres or those engaged in preparedness initiatives.

<sup>149</sup> Ministry of Environment and UNICEF (2024). Children's Climate Risk Index for Cambodia. Available [here](#)

## 2.8 Implementation arrangements

Each country in component 1 will be implemented as separate country-specific and country-owned projects each with EEs to manage fund flows and fiduciary requirements of the project in accordance with GCF standards. In Cambodia the EEs will be Save the Children International in Cambodia and Ministry of Education, Youth and Sport (MoEYS). All EEs will have Subsidiary Agreements (SAs) with Save the Children Australia as Accredited Entity (AE).

Project Implementation Units (PIUs) will be established in each of the three countries to monitor and oversee technical and financial implementation, fiduciary processes, auditing, measurement reporting and verification system, and internal evaluation of the project. The Project Steering Committee (PSC) will oversee the PIUs and provide it with guidance and direction while receiving regular reports on project implementation. The PIUs will receive funds (both GCF and co-financing) distributed according to the Subsidiary Agreements with the EEs and procurement contracts for the provision of goods and services and will oversee the delivery of project activities and manage day-to-day operations.

To meet the fiduciary requirements and standards of the GCF, legal and management oversight of the PIU in Cambodia will be held by SCI Cambodia which has the legal standing necessary to implement GCF activities in Cambodia. PIU in Cambodia is referred to as the Project Secretariat according to MoEYS new modality of project implementation arrangement. SCI Cambodia is also legally and organizationally bound to SCA, which acts as AE and holds the AMA with the GCF on behalf of the SC movement.

Based on comprehensive due diligence assessments of all EE's, as AE, SCA will channel GCF resources to a project-specific bank account managed by the PIU in Cambodia. The PIU will use these resources and co-financing to manage project governance and implementation and will manage all downstream flows to the country Ministries, implementing partner UNESCO, and any other procured partners. (Note: Implementing partners will be selected and subcontracted as procured parties in accordance with the AE's procurement guidelines.)

MOEYS will follow standard practice within the Government of Cambodia to establish relationships with the Ministry of the Environment and any other Government partners that may be supporting the project.

The project steering committee in Cambodia will be co-chaired by Save the Children Cambodia Country Director and MOEYS Project Director. Members of the committee will include the Deputy Project Directors from key MOEYS Departments, and a representative from the Ministry of the Environment. In Cambodia, the PIU will be called a Project Secretariat and will be a joint team composed of MOEYS and Save the Children Cambodia project staff who will report to the PSC.

Save the Children Cambodia has extensive experience delivering climate resilience and education projects, positioning the organization as a key player in implementing programmes similar to BRACE. Notably, Save the Children led the Green Generation programme, a successful initiative integrating environmental education into formal and informal learning settings across Cambodia and other countries. This programme engaged children and communities to address local environmental challenges, with a focus on climate change education, waste management, and water conservation. The programme's success was built on strong collaboration with local schools and government agencies including MOEYS, and involved the development of teaching units and hands-on eco-projects in schools.

Additionally, Save the Children has contributed to school safety and disaster preparedness through its work under the ASEAN Safe Schools Initiative and the development of Cambodia's School Safety Guidelines. These projects have equipped schools with DRR strategies, such as contingency planning and climate-proofing infrastructure, ensuring educational continuity during extreme weather events. Save the Children's strong partnerships with the Cambodian government and grassroots organizations further highlight its capability to scale up climate adaptation efforts, ensuring vulnerable children continue learning even in the face of environmental crises.

All activities will be implemented in line with the project's Gender Assessment and Action Plan (see Annex 8), which is aligned with the GCF's Gender Policy and SC's gender, inclusive development, and child safeguarding policies and Prevention of Sexual Exploitation and Abuse policy and guidelines. Per the Gender Action Plan, all project activities prioritize building the resilience of the most vulnerable community members (e.g., women, children, ethnic minorities). Activities will contribute to gender transformation, ensure community and child participation, and ensure universal access principles are incorporated into health facility upgrades where possible.

All activities will be implemented in line with the project's country Environmental and Social Action Plans (ESAPs), which is aligned with the GCF's safeguards policies and includes a Grievance Redress Mechanism.

## 2.9 Risk factors and mitigation measures

| Selected Risk Factor 1 – Low Technical Capacity  |             |  |
|--|-------------|--|
| Category   | Probability |  |
|  |             |  |
| Description  |             |  |
| Limited technical capacity among local stakeholders, including education authorities and community members, could hinder the effective implementation and sustainability of climate adaptation measures in Cambodia potentially leading to suboptimal project outcomes.  |             |  |
| Mitigation Measure(s)  |             |  |
| The BRACE initiative will implement a comprehensive capacity-building programme targeting government officials, local communities, and project partners across Cambodia. This programme will focus on enhancing technical knowledge in climate-smart education systems, DRR, and child protection in schools, aligned with national frameworks like Cambodia's Comprehensive School Safety Framework and the Child-Friendly School Program. To support this, BRACE will establish national and sub-national platforms for knowledge sharing and coordination, particularly through activities such as virtual and offline child-and-youth-led campaigns for climate action and cross-coordination meetings between ministries and relevant actors. Regular monitoring and mentoring mechanisms will be put in place to ensure the application of learned skills and knowledge, with continuous technical support provided to local stakeholders to foster long-term capacity development. Additionally, partnerships with local universities and technical institutes will be established to strengthen the sustainability of these capacity-building efforts. |             |  |
| Selected Risk Factor 2 – Climate Vulnerability   |             |  |
| Category   | Probability |  |
|  |             |  |
| Description  |             |  |
| High vulnerability to climate change impacts, such as extreme weather events and sea-level rise, could disrupt project activities and threaten the safety and livelihoods of target communities in South Sudan, Cambodia, and Tonga.   |             |  |



| Mitigation Measure(s)  |             |  |
|--|-------------|--|
| BRACE will incorporate climate risk assessments into its planning and implementation phases to ensure that interventions are resilient to local climate conditions. In Cambodia, for instance, the project will prioritize retrofitting school infrastructure to withstand extreme weather, including improving airflow, drainage, and accessibility. In Cambodia, BRACE will support the establishment of school-based early warning systems linked to national platforms for real-time impact monitoring, enabling schools to better prepare for and respond to climate-related events. The project will also promote adaptive agricultural practices and livelihood diversification to enhance community resilience. Infrastructure improvements, such as climate-resilient WASH facilities, will be prioritized to protect vulnerable populations. Emergency response plans will be developed and regularly updated, with ongoing collaboration with meteorological agencies and climate experts to provide data and insights that inform adaptive management. Regular drills and simulations will be conducted to ensure readiness for climate-related disruptions, and partnerships with local communities will be fostered to strengthen local capacities for disaster risk reduction.                        |             |  |
| Selected Risk Factor 3 – Fraud and Corruption  |             |  |
| Category   | Probability |  |
|  |             |  |
| Description  |             |  |
| The risk of fraud and corruption in financial management and procurement processes could lead to the misallocation of funds, compromising the project's integrity and outcomes.  |             |  |
| Mitigation Measure(s)  |             |  |
| Key mitigation measures will include strict adherence to anti-fraud and anti-corruption policies, compliance with national institutional structures, and the application of robust monitoring and reporting procedures. BRACE will enforce anti-fraud and anti-corruption policies through rigorous audits and transparent reporting mechanisms, with oversight provided by independent PIU teams. Digital tools will be employed to track expenditures and procurement processes, reducing opportunities for corruption. Furthermore, all project staff and partners will undergo mandatory training on ethical standards, anti-corruption practices, and the consequences of non-compliance. A whistleblower protection mechanism will be established to encourage the reporting of suspicious activities without fear of retaliation. Regular risk assessments will be conducted to identify and address any emerging vulnerabilities in financial management, and specific procedures, such as the separation of duties between project management and executing entities, will be employed to maintain independent and effective financial oversight.   |             |  |
| Selected Risk Factor 4 – Construction Risk   |             |  |
| Category   | Probability |  |
|  |             |  |
| Description  |             |  |
| Lack of design input and requisite supervisory budget results in poor quality of design and poor workmanship.  |             |  |
| Mitigation Measure(s)  |             |  |
| Supervision will be carried out by qualified Save the Children Structural Engineers/Construction Managers or a qualified third party. Technical consultations will include the Save the Children Regional Office Construction Advisor to ensure safe programming and appropriate project design. At least 10% of the budget is dedicated to supervision and also covers construction costs, staff supervision, and fleet requirements. Safety and security assessments will be conducted with guidance from the country office safety focal point and GEDSI specialist. The retrofitting design aims to enhance building resilience and will include planning that covers site surveys, water and power supply assessments, site access conditions, hazard risk assessments, environmental impact considerations, building consent acquisition, and market surveys for material availability. Adequate time will be allocated for the recruitment and induction of technical staff, as well as for design/assessment, site selection (including Safety Audit and Accessibility Assessment), tendering, contractor assessment, construction implementation, approval processes, and accounting for potential seasonal interruptions due to weather. The proposed rehabilitation/retrofitting of school buildings will |             |  |

undergo structural engineering assessment by a qualified civil engineer and will incorporate design principles for vulnerable beneficiaries, integrated WASH, and inclusion measures.

## 2.10 GCF Investment Criteria

### 2.10.1 Impact potential

The project will contribute to GCF's overarching adaptation impact – increased climate-resilient sustainable development – by directly increasing the climate resilience of 392,544 people (188,550 female), including youth and school-aged children in highly climate vulnerable remote schools in Cambodia, amounting to 2% of the population. A total of 4,031,400 indirect beneficiaries will be reached (1,962,128 female). Furthermore, the climate resilience of at least 240 schools will be strengthened to better cope with climate hazards such as sea level rise, droughts, floodings, extreme weather including tropical cyclones and heatwaves, and ongoing climate change.

The project will contribute to several of the GCF's Fund-level adaptation and enabling environment outcomes including:

- ARA 1 (Most vulnerable people and communities) - Output 1.2 targets some of the most climate-vulnerable remote schools in Cambodia with climate resilient school infrastructure retrofits and access to internet connectivity and renewable energy for EWS/CIS. Output 1.3 strengthens the school safety and climate resilience of targeted schools, ensuring students are able to safely enjoy an uninterrupted education. Output 1.4 ensures that Cambodian students, who are all facing the impacts of climate change, are able to build their knowledge, skills and capacities.
- ARA 2 (Health, well-being, food and water security) - Output 1.2 and output 1.3 increases access to and climate-resilience of school facilities and WASH facilities as well as strengthening school safety and educational continuity systems.
- ARA 3 (Infrastructure and built environment) - Output 1.2 will increase the climate-resilience of school infrastructure and WASH-facilities.
- Core indicator 6 (Degree to which GCF investments contribute to technology deployment, dissemination, development or transfer and innovation). The project will contribute to the Hama-eLearning platform and ensure for an innovative way to disseminate information.
- Core indicator 7 (Degree to which GCF Investments contribute to market development/transformation at the sectoral, local, or national level). Through the climate elective, the project will support and prepare secondary level students for climate-related career options, contributing to a national pool of climate-related experts ready to strengthen Cambodia's climate resilience.

### 2.10.2 Paradigm shift

As described in the Project description section and the overall ToC, building on the inextricable interconnected pillars of Comprehensive School Safety Framework (CSSF), the BRACE project will lead to a paradigm shift and transformative changes that will mean lasting impacts. The outputs and activities of the project will contribute to significant results with regards to the safety of students due to school infrastructural improvements and school safety and educational continuity management systems. It will also strengthen their knowledge, skills, and capacities on climate change preparing them for climate-related careers. The BRACE project also contributes to the strengthening of the enabling environment and mitigation of key barriers such as gender and social inclusion, financial, institutional, technological, and infrastructure barriers.

- **Gender and social inclusion:** Special attention will be paid to gender and social inclusion ensuring that youth, children, women, girls and people with disabilities will be represented in decision-making, that interventions will pay specific attention to their needs and that their capacities will be strengthened appropriately.
- **Financial:** The project will partially close the existing financial gap in order to strengthen the climate resilience of the education sector. It will also build on other initiatives, such as CSESI, to bring more climate finance to Cambodia.
- **Institutional:** Support to school safety and educational continuity management systems will normalise and institutionalise practices at school. The project will build institutional capacity through developing tools, coordination, and various trainings. Trainings, or refresher trainings, will be recorded to ensure institutional memory.
- **Technological and informational:** Through offering internet connectivity, schools will be able to access CIS and EWS. Students will be able to build their technical and practical skills and knowledge on climate change, through a new climate change elective, preparing them for climate-related jobs. BRACE investments in school safety and educational continuity mechanisms will prepare students for a climate-resilient future and climate-related career pathways.
- **Infrastructure:** Through physical retrofits of school facilities, including for WASH, internet connectivity and PV systems, the climate resilience of school infrastructure will be strengthened.

The BRACE project contributes to climate-resilient development pathways consistent with development, climate change, and educational strategies and plans. The project's paradigm change will be underpinned by:

- Targeted school-aged children with significantly increased knowledge of current and projected climate change impacts and increased skills for climate-related professions/careers through climate change-related curriculum and climate electives
- Targeted schools with safer and more climate-resilient school facilities supported by internet connectivity and renewable energy and enhanced access to climate information and early warnings
- Targeted schools with strengthened climate and disaster preparedness and awareness and school safety and resilience plans.

### **Scalability and replicability**

BRACE has a high potential for both scalability and replicability, aligned with, and designed to support achievement of the objectives of national policies. It also has high complementarity and coherence with other relevant climate-focused projects. The CSSF model could be scaled up to ensure additional schools will receive infrastructural improvements (output 1.2); that school safety and educational continuity management systems will be in place (output 1.3); and that the developed climate education curriculum (output 1.4) will support and reach growing numbers of students.

### **Knowledge sharing and learning agenda**

Part of each project component will be dedicated to knowledge sharing and learning engagement between different stakeholders focused on school safety. The learning agenda will be implemented and shared internally in Cambodia through annual lessons learned and reflection workshops.

The Evidence Forum will be conducted through the project in collaboration with MoEYS, MoE, and other partners.

The project has budgeted for additional research projects to evaluate the impact of particular interventions, and quasi-experimental studies are envisaged within the project MEAL framework, to identify causal impact of the interventions. The project will fund learning events as part of the research studies, which will be attended by a range of government, NGO, and institutional stakeholders. Many of the interventions are relatively new within the Cambodian context and as such, BRACE is in a unique position to test the ideas on a relatively small scale and share key findings with all relevant bodies.

### 2.10.3 Sustainable development

SC in Cambodia has demonstrated (among other projects) lessons from the Norad-funded programme from 2010 to 2020, including the *I'm Learning*<sup>150</sup> pilot project; this is that sustainable development is best achieved through multiple strategies. A key strategic approach is integrating programmes with the local and national government plans, ensuring that programmes are aligned with broader governmental objectives and can be sustained through policy support. SC also identifies gaps and needs for policy development, and addresses this through programme-based advocacy, working in close partnership with the authorities, building on the evidence generated at programme level and contributing to capacity development and awareness raising among key decision makers at local and national government.

Emphasizing community engagement and local ownership of programmes is another important strategy for ensuring sustainability. By actively involving the community in programme activities from the start through community consultations, building awareness, and generating buy-in at local level, SC is fostering a sense of ownership, responsibility and commitment among local stakeholders, which is crucial for the long-term sustainability of the programme.

Coordination and exchange of learning and evidence across the different actors in the sector has proven to be another key strategy for achieving sustainable results at scale through replication of best practices. SC in Cambodia has been a significant actor in the education sector since 1979. It has a long-standing and close collaboration with stakeholders and key actors in the education sector at local and national level, which has provided SC a strong standing and trust among the key education actors. Some of SC in Cambodia's key programme approaches in the education sector, such as QLE (Quality Learning Environment) and SBM (School-Based Management), have been designed to be applied in various contexts and expanded upon by duty bearers to reach a larger number of beneficiaries, and proven to be scalable and replicable. The QLE and SBM provided the foundation for the *school-based management policy* which has been rolled out nation-wide by the MOEYS.

The end-line evaluation of the Norad programme in 2010<sup>151</sup>, points at several other examples of programme activities which have been handed over from SC and utilized by beneficiaries, government and national CSOs. The process for identifying and agreeing to these activities was established through the joint development of the programme. There are robust examples of programme approaches and activities that have been replicated in other district and provincial schools, new projects, and partner projects. Specific examples of replication include, for example: the SC Korea-funded EQUAL project; work undertaken by Plan International drawing on the *I'm Learning* model; sub-national duplication of programme mechanisms (education, Child Protection, Child Right Governance, and DRR); sub-national programme model being expanded to and implemented in the Stung Treng and Ratanakira provinces; the FCF/REACT project; and WOMEN's use of the programme model in an EU-funded project. The programme results were evaluated to be highly likely to be sustained after the programme support period ends.

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<sup>150</sup> [I'm Learning Contextualization Report\\_Final.pdf](#)

<sup>151</sup> [SC Cambodia. Norad Evaluation Report\\_10June2021.docx](#)

SC is continuously learning and adapting its approaches based on past experiences. Scalability and replicability are achieved through demonstrating success, promoting adaptable and flexible programme mechanisms, and providing technical support to tailor programmes to various educational contexts.

#### 2.10.4 Needs of recipient

Cambodia is one of the poorest countries among the Association of Southeast Asian Nations (ASEAN) characterised by endemic corruption, limited educational opportunities, high income inequality and poor job prospects.<sup>152</sup> Cambodia is one of the more disaster-prone countries in Southeast Asia, affected by floods and droughts due to high levels of exposure and vulnerability.<sup>153</sup>

The country's vulnerability to climate change is linked to its characteristics as a post - civil war, least developed, predominantly agrarian country, with 76% of the population living in rural areas.<sup>154</sup> Along with the Philippines, Cambodia is regarded by the United Nations and the International Development Research Center as Southeast Asia's most vulnerable nation to the consequences of climate change.<sup>155</sup> The ND Gain provides a rating of 149<sup>th</sup> most vulnerable country out of 187, with equally low rankings for vulnerability (130) and climate readiness (158)<sup>156</sup>. Cambodia faces severe climate change vulnerabilities, ranking as the second most vulnerable country globally to climate hazards according to the 2024 INFORM risk index.<sup>157</sup>

Additionally, Cambodia ranks 46<sup>th</sup> out of 163 countries<sup>158</sup> in UNICEF's Children's Climate Risk Index based on climate and environmental shocks, which is in the top third of countries with a high risk to climate change. The UNICEF media release found that Cambodian children are highly exposed to water scarcity, riverine flooding, and vector-borne disease. Furthermore, the Global Climate Risk Index ranks Cambodia as the 14<sup>th</sup> most climate risk prone country globally<sup>159</sup>. The country is particularly vulnerable to the hazards of floods, droughts, heatwaves, cyclones, and seawater intrusion due to its geographic location.

The education sector's vulnerability to climate change is evident in the direct impact on school infrastructure, the indirect effects on learning and health, and the broader economic and social consequences. These vulnerabilities underscore the urgent need for climate-resilient education systems that can withstand and adapt to the challenges posed by a changing climate.

To foster a society that is informed and capable of responding to climate change challenges, the climate change vulnerabilities in the education sector must be addressed. The education sector must integrate climate resilience into planning and operations, which includes constructing climate-resilient infrastructure, developing DRR strategies, incorporating climate change into the curriculum, build pedagogical capacity and content knowledge among teachers and educators, and supporting communities to adapt to climate change impacts.

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<sup>152</sup> Center for Strategic and International Studies. Spotlight-Cambodia. [Available here](#)

<sup>153</sup> The World Bank Climate Knowledge Portal. Cambodia. [Available here](#)

<sup>154</sup> Ibid

<sup>155</sup> Reaksmey. "UN Reports: Cambodia At High Risk From Climate Change – Cambodia's Official Climate Change Website". Available [here](#)

<sup>156</sup> ND-GAIN Index, 2022. [Available here](#). /.:

<sup>157</sup> INFORM risk index for Cambodia. Available [here](#)

<sup>158</sup> UNICEF, Media Release, 2021. Available [here](#).

<sup>159</sup> Global Climate Risk Index, 2021. [Available here](#).

#### 2.10.5 Country ownership

Country ownership is embedded through BRACE's strong partnerships with government ministries and extensive stakeholder engagement, in addition to alignment with the national policies, climate change strategies, and gender action plans of these countries. BRACE aims to support national climate and education priorities while addressing challenges faced in Cambodia.

#### **Policy alignment and support**

BRACE aligns with the national climate change strategies and educational policies of Cambodia, ensuring that the project supports Cambodia's efforts to build a climate-resilient education system. BRACE supports the Cambodia Climate Change Strategic Plan (CCCSP) 2014-2023 and the National Action Plan for Disaster Risk Reduction (NAP-DRR), which emphasize integrating climate resilience into the education sector.

BRACE supports the implementation of national strategies by improving the climate resilience of school infrastructure, integrating climate change education into curricula, and enhancing disaster preparedness. By aligning with these policies, BRACE contributes directly to the broader climate adaptation goals of Cambodia, ensuring that educational continuity is maintained despite increasing climate risks.

#### **Alignment with gender action plans and policies**

Please see **Annex 8** for more information. The project is designed to be gender-responsive and more broadly inclusive, to address the unique needs of girls, children with disabilities, women, and internally displaced people. **Cambodia's** Gender Mainstreaming Strategic Plan in Climate Change and Disaster Risk Management is supported by BRACE's efforts to ensure that both girls and boys have equal access to climate-resilient educational facilities.

#### **Complementarity and coherence with government policies and plans**

BRACE is designed to complement existing government initiatives and frameworks, ensuring coherence with national development plans and sectoral strategies. BRACE complements the National Biodiversity Strategy and Action Plan (NBSAP) and the Rectangular Strategy Phase IV, which prioritize environmental sustainability and natural resource management. By building on these initiatives, BRACE maximizes its impact and contributes to a coordinated national response to climate change. The project's design ensures that interventions are integrated into existing frameworks, allowing for the efficient use of resources and ensuring that project activities are sustainable and scalable.

#### **Key partner engagement and government leadership**

The successful implementation of BRACE depends on strong partnerships with government ministries and leadership from local authorities. MoEYS leads the project's implementation, working closely with local governments and development partners to integrate climate resilience into the education sector. BRACE engages local governments, community organizations, and school management committees, ensuring that interventions are contextually relevant and sustainable. By fostering a sense of ownership among local stakeholders, the project ensures that the benefits of climate resilience are maintained long after the project's completion.

#### **Ownership and stakeholder consultations**

Please see **Annex 7** for more information. Stakeholder engagement has been a critical component of the BRACE project's development and implementation. Extensive consultations with government agencies, local communities, non-governmental organizations, and development partners have

ensured that the project aligns with local needs and priorities. Discussions with national and sub-national stakeholders helped identify key areas of intervention, ensuring that the project is responsive to local capacities and vulnerabilities. These consultations have not only shaped the project's design but also fostered broad support for its implementation. BRACE will continue to engage stakeholders throughout the project implementation, ensuring ongoing alignment with national and community priorities and enabling adaptive management based on stakeholder feedback. The involvement of local communities and educational institutions in the project's design and implementation will further ensure that interventions are contextually appropriate and have a lasting impact.

#### 2.10.6 Efficiency and effectiveness

The project partners will draw on past experiences in implementing projects and meeting best practices (including GCF requirements and GCF's shared learnings) in addition to drawing on efficiencies from the GPE and Save the Children International and available resources, and the AE's track record in delivering large-scale GCF projects. This project specifically aims to strengthen the climate resilience of the most climate-vulnerable schools in output 1.2. These schools are in remote and geographically challenging parts of the country, requiring significant logistical undertakings to bring human resources and materials to these places. These challenges are a key element of why these schools are highly vulnerable to the impacts of climate change and have limited opportunity to strengthen their adaptive capacities. Strengthening these infrastructures is at a high cost but will meet the immediate needs of these vulnerable schools, making the cost justifiable.

As output 1.3 and output 1.4 will be developed at national level, the implementation costs will be more cost-effective. The implementation and rollout of Training of Trainings and Teacher Trainings will require travel costs to ensure that climate focal points and teachers can attend, however, these activities are the most cost-effective, as all the preparation and development of materials can be done in advance at national level.

The project will review the SCI construction policy/benchmark, MoEYS's construction guidelines and also avoid overlapping targets with other projects' provinces and schools, thus ensuring effective spending and increasing impact.

#### 2.11 Sustainability and exit strategy

The BRACE project in Cambodia focuses on achieving climate resilience while ensuring long-term sustainability and local ownership. The exit strategy aims to transition from project implementation to local stewardship, ensuring that established practices endure and evolve. This strategy emphasizes scaling successful practices, integrating climate actions into national policies and budgets, and building institutional and community capacities.

##### **National Policy Alignment**

The project is aligned with national policies to promote long-term sustainability. In Cambodia, the project integrates with the Comprehensive School Safety Framework and the Child-Friendly School Program, enhancing education policies with a focus on climate-smart systems, environmental sustainability, and disaster risk management. By establishing platforms for knowledge sharing and coordination, the project enables MoEYS and other relevant ministries to integrate climate resilience into educational planning and access climate finance.

##### **Local ownership and capacity building**



Building local ownership and strengthening institutional capacity are critical to ensuring the sustainability of the project's outcomes. In Cambodia, the project strengthens the capacity of MoEYS and other relevant ministries by establishing a platform for knowledge exchange and coordination. This platform facilitates the implementation of climate education and disaster risk management within the education sector, supported by the development of a National Climate Resilience in Education Framework. This framework will enable MoEYS to integrate climate actions into educational policies and access climate finance, ensuring the long-term sustainability of the project's outcomes.

### **Scaling best practices**

The project is designed to scale best practices, ensuring maximum impact. In Cambodia, the project scales successful models in climate-resilient education and school safety by retrofitting schools, enhancing WASH infrastructure, and rolling out the Green Generation initiative. This initiative integrates environmental education and resilience into school curricula and non-formal education activities, promoting environmental awareness. These efforts ensure that best practices in climate resilience and education are shared, adapted, and scaled to enhance sustainability across the education sector.

### **Operations and Maintenance Strategy**

A robust operations and maintenance (O&M) plan is vital to the sustainability of the project's infrastructure and activities. In Cambodia, O&M plans will be established for retrofitted schools, ensuring gender and disability inclusivity. The project will provide training to school staff and local administration on maintaining school infrastructure, linking these efforts to broader school safety management systems. Community-based monitoring systems will further ensure the continued functionality of these infrastructures, supported by local government plans and budgets.

## 3. Component 1: South Sudan

### 3.1 Country context

The information from this section draws extensively from the Climate-Smart Education Systems Initiative (CSESI) inception report for South Sudan prepared by the Education Development Trust on behalf of CSESI initiative partners Save the Children, UNESCO, and UNESCO IIEP with funding from the Global Partnership for Education (GPE).

#### 3.1.1 Country overview

The Republic of South Sudan is a landlocked country in east-central Africa which gained independence from the Republic of Sudan on 9<sup>th</sup> July 2011, making it the world's youngest nation and Africa's 54<sup>th</sup> country.<sup>160</sup> South Sudan borders Sudan to the north, Ethiopia to the east, Kenya to the southeast, Uganda to the south, the Democratic Republic of Congo to the southwest and the Central Africa Republic to the west. The country is approximately 650,000 km<sup>2</sup> and is situated almost entirely in the Nile River Basin, receiving water from the highlands of Central Africa Republic, the Democratic Republic of Congo, Ethiopia, and Uganda.<sup>161</sup>

As of 2022, South Sudan is home to approximately 12.4 million people<sup>162</sup>, the majority (54%) are aged between 15 and 64 years of age with 42% of the population aged 0-14.<sup>163</sup> Following independence, the country was impacted by outbreaks of civil wars, particularly in 2013 and 2016, which undermined the post-independence progress and worsened its humanitarian situation.<sup>164</sup> Presently, South Sudan remains fragile and economically unstable. This situation is characterized by politically instigated conflict, displacement, and climate shocks.<sup>165</sup> South Sudan is comprised of ten states and three administrative areas (Greater Pibor, Ruweng and Abyei).<sup>166</sup>

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<sup>160</sup> IGAD. Country Profile: South Sudan. [Available here](#)

<sup>161</sup> IGAD. Country Profile: South Sudan. [Available here](#)

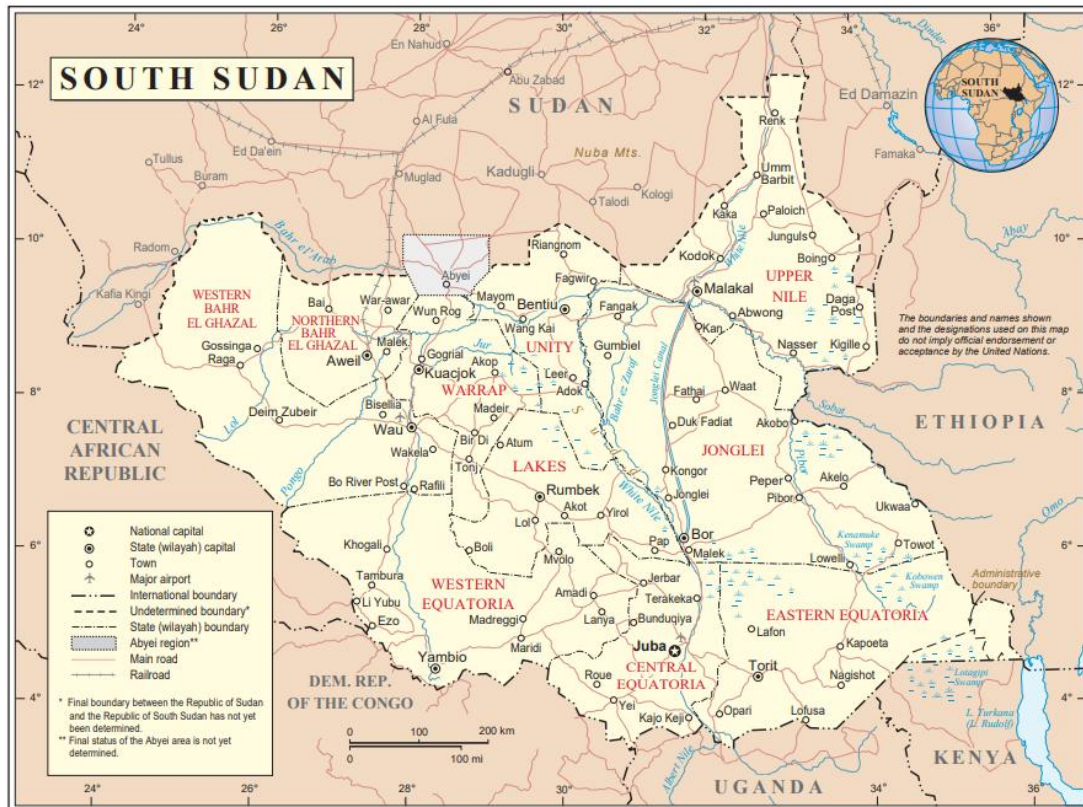
<sup>162</sup> The country's last population census was in 2008, when it was still an autonomous region of Sudan.

<sup>163</sup> UNFPA. [Available here](#)

<sup>164</sup> The World Bank in South Sudan. [Available here](#)

<sup>165</sup> The World Bank in South Sudan. [Available here](#)

<sup>166</sup> Abyei is an area on the border between South Sudan and Sudan considered to be simultaneously part of the Republic of Sudan and the Republic of South Sudan.



**Map of South Sudan** Source: United Nations<sup>167</sup>

South Sudan is classified as a least developed country and is currently one of the most underdeveloped countries in the world. According to IMF (2023)<sup>168</sup>, “Oil contributes about 60% of GDP, 95% of exports and 90 percent of government revenue”. However, approximately 95% of South Sudan’s population relies on agriculture as their primary sources of income. The country faces one of the world’s worst food security situations and is considered one of the poorest countries in the world.<sup>169</sup> According to the World Bank report of 2020,<sup>170</sup> more than 80% of South Sudanese live under the absolute poverty line.<sup>171</sup> South Sudan holds the largest refugee crisis in Africa, with 2.23 million people having fled to neighbouring countries and 2.2 million South Sudanese internally displaced, largely due to violent conflict.<sup>172</sup>

### 3.1.2 Legal and regulatory landscape

South Sudan functions under a decentralized system, with responsibilities divided between the national, state, and local levels. This type of system was adopted in the interim constitution of 2011 with aims ‘to accommodate the ethnic, cultural, linguistic, religious and racial diversity of the South Sudanese people, promote political pluralism and maintain peace’ (GoSS, 2011). The key responsibilities of the *central government*, which is based in Juba, include the maintenance of peace and security, reconstruction and development, and the promotion of good governance. It exercises

<sup>167</sup> UN.org, Map of South Sudan. [Available here.](#)

<sup>168</sup> IMF 2023: Available [here](#)

<sup>169</sup> <https://www.imf.org/-/media/Files/Publications/CR/2023/English/1SSDEA2023001.ashx>

<sup>170</sup> World Bank (2020). South Sudan Economic Update: Poverty and Vulnerability in a Fragile Environment. [Available here](#)

<sup>171</sup> Poverty line is the minimum amount of money an individual needs to fulfill the necessities of life. As of September 2022, the extreme poverty line is USD2.15 per person per day. [The World Bank](#)

<sup>172</sup> <https://www.unrefugees.org/news/south-sudan-refugee-crisis-explained/>

power over critical aspects that include national defence and security, foreign affairs, and the judiciary (GoSS, 2011). *States* exercise power over social welfare, including administering state pensions, state civil service, and pre-school, primary, and secondary education (GoSS, 2011). Both national and state governments are responsible for tertiary education and scientific research (GoSS, 2011). Each state has its Ministry of Education (SMoE) with a minister, and it is largely modelled around the national structure.<sup>173</sup>

Local government structures encompass tiers at *county*, *payam*, and *boma* levels. According to the constitution, the objective of local governments includes ‘promoting self-reliance among the people through mobilization of local resources to ensure the provision of health and educational services to communities’ (GoSS, 2011). In this way, local governments, just as at the state and national levels, have the power to levy fees and taxes. Outside this tax revenue, the national government provides transfers to states to aid them in the administration of their functions.<sup>174</sup>

### 3.1.3 Education sector overview

The education system in South Sudan is guided by the General Education Act (2012)<sup>175</sup>, the National General Education Policy (2017-2027)<sup>176</sup>, periodic education sector plans, and a competency-based curriculum framework<sup>177</sup>. A recent Education Sector Analysis (ESA)<sup>178</sup> and Enabling Factors Analysis (EFA)<sup>179</sup> were conducted in 2023. The findings of the ESA and EFA brought to light the bottlenecks affecting the education sector in South Sudan including: a) non-conducive environment for learners and school staff, b) low and inequitable access to education, c) low supply of qualified teaching workforce, d) gaps in curriculum development and implementation, e) gaps in the national assessment system, and f) weak retention of learners. Based on the sector analysis, the new General Education Sector Plan (GESP) 2023-2027 identifies 12 policy goals within the areas of improving: 1) access to and equity in education, 2) quality of education and management of resources, and 3) education financing and governance. Further, the South Sudan Partnership Compact (2024)<sup>180</sup> derived its policy outcomes from the ESA and EFA and will contribute delivery of the GESP 2023-2027 by focusing on support to four key interrelated policy outcomes areas: a) improved teaching practices and better implementation of the curriculum, b) enhanced support to schools to sustain more equal and better learning opportunities, c) increased access to and attendance of education, with a focus on providing better opportunities for girls and children with disabilities, and d) improved service delivery and coordination of general education.

Education provision in South Sudan experiences several challenges which negatively impact on both access and quality. For instance, according to UNESCO Institute for Statistics, South Sudan has a literacy rate of 30% and the highest rate of out-of-school children of primary school age in the world (62%).<sup>181</sup> Some of the chronic issues affecting the education sector include economic barriers, gender

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<sup>173</sup> South Sudan Education Sector Analysis, 2023, UNESCO IIEP, <https://unesdoc.unesco.org/ark:/48223/pf0000387120>, p. 27

<sup>174</sup> South Sudan Education Sector Analysis, 2023, UNESCO IIEP, <https://unesdoc.unesco.org/ark:/48223/pf0000387120>, p. 27

<sup>175</sup> The Laws of South Sudan, General Education Act 2012, <https://dr.211check.org/wp-content/uploads/2021/12/General-Education-Act-2012.pdf>

<sup>176</sup> South Sudan, the National General Education Policy, 2017-2027, [https://planipolis.iiep.unesco.org/sites/default/files/ressources/south\\_sudan\\_the\\_national\\_general\\_education\\_policy\\_2017\\_2027\\_eng.pdf](https://planipolis.iiep.unesco.org/sites/default/files/ressources/south_sudan_the_national_general_education_policy_2017_2027_eng.pdf)

<sup>177</sup> South Sudan Curriculum Framework, <https://www.curriculumfoundation.org/blog/wp-content/uploads/SS-Curriculum-Framework.pdf>

<sup>178</sup> South Sudan Education Sector Analysis, 2023, UNESCO IIEP, <https://unesdoc.unesco.org/ark:/48223/pf0000387120>

<sup>179</sup> Assessment of Enabling Factors, South Sudan, September 2023

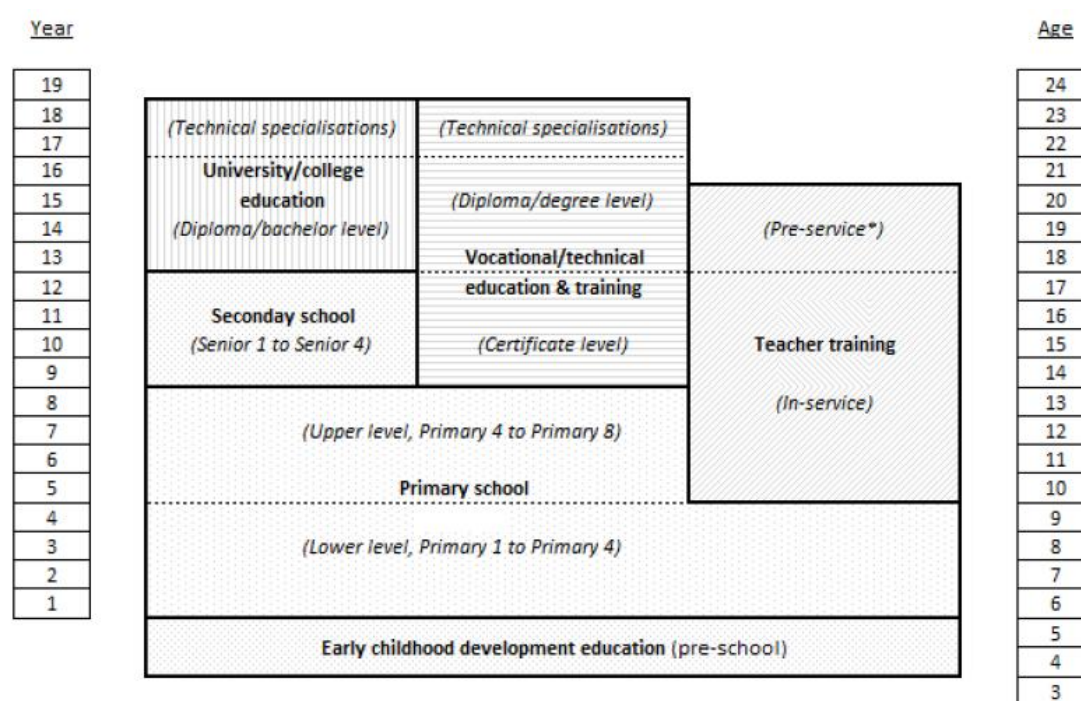
[https://www.globalpartnership.org/node/document/download?file=document/file/2023-09-south\\_sudan-itap.pdf](https://www.globalpartnership.org/node/document/download?file=document/file/2023-09-south_sudan-itap.pdf)

<sup>180</sup> South Sudan Partnership Compact, 2023, <https://www.globalpartnership.org/content/south-sudan-partnership-compact-2024>

<sup>181</sup> UNESCO (2019). Out-of-school-children rates. [Available here](#)

inequalities, inadequate school infrastructure, inadequate WASH facilities in many schools across the country, insufficient teacher supply and inadequate teaching and learning resources.<sup>182</sup> Schools in South Sudan lack the capacity to mitigate and respond to protection risks for learners, particularly girls, while continued attacks on schools by armed groups remains a threat to the continuity of education.<sup>183</sup> In June 2022, for instance, 24 schools were reported to be occupied by armed groups in Central Equatoria state leading to direct attacks on education staff.<sup>184</sup>

The education system in South Sudan comprises both formal and non-formal education. Formal education consists of pre-school (for children in the ages of 3-5 years), primary education (consisting of 8 years), secondary education (consisting of 4 years) and tertiary education (consisting of 4 years).<sup>185</sup> At the end of secondary education, students sit for the South Sudan Secondary School Certificate administered by the Ministry of General Education and Instruction (MoGEI). The Figure below shows the structure of the South Sudan's education system.



\* Pre-service teacher training lasts three (3) years for P8 leavers and two (2) years for secondary leavers

### Structure of the education system, South Sudan

The Education Act establishes the school calendar to run for three terms for a period of nine months, beginning early February to December of the same year. In Early Childhood Development (ECD) and primary one to three, the indigenous language of the area in which a school is located is the language of instruction, while schools located in urban areas may choose to use more relevant or widely used national languages.<sup>186</sup> English is used as the language of instruction from primary four while indigenous languages continue being taught as subjects.

<sup>182</sup> South Sudan Education Cluster Strategy (2023 – 2025). [Available here](#)

<sup>183</sup> South Sudan Education Cluster Strategy (2023 – 2025). [Available here](#)

<sup>184</sup> South Sudan Education Cluster Strategy (2023 – 2025). [Available here](#)

<sup>185</sup> National Education Census Report 2021. [Available here](#)

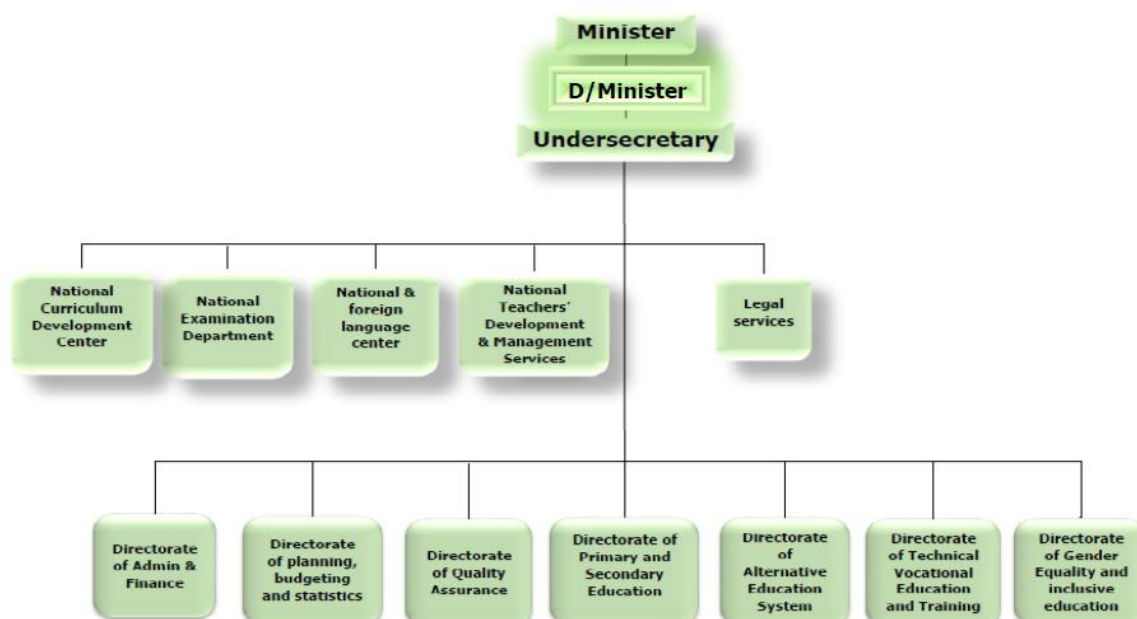
<sup>186</sup> General Education Act 2012. [Available here](#)



The responsibility for education provision in South Sudan is organized under two ministries: the Ministry of General Education and Instruction (MoGEI), responsible for pre-primary, primary, secondary, and alternative education system and the Ministry of Higher Education, Science and Technology (MoHEST) responsible for tertiary education.

### Structure of the Ministry of General Education and Instruction

The Ministry of General Education and Instruction is headed by the Minister and consists of seven directorates as shown below.



### MoGEI organogram<sup>187</sup>

#### School infrastructure and enrolment

According to the 2021 National Education Census, South Sudan has a total of 40,694 classrooms across all education institutions (pre-primary to tertiary levels). This consists of 14,985 (37.1%) that are permanent structures, 8,327 (20.4%) that are semi-permanent, 2,599 (6.4%) that only have roofs and no walls, 352 (0.9%) tents and 14,431 (35.3%) that are open air under trees.<sup>188</sup> However, several pre-primary, primary, and secondary schools in South Sudan had been closed during the 2021 National Education Census and therefore designated as non-operational: 27% were closed due to conflict, 26% due to a lack of teachers, 19% due to a lack of learners, and 16% due to natural disasters.<sup>189</sup>

The table below provides data on enrolment rates and teaching workforce across General Education levels in South Sudan.

| LEVEL | Pre-primary education:<br>(2 years) | Primary education<br>(8 years) | Secondary Education<br>(4 years) | Tertiary Education<br>(4 years) | Total ECD - Secondary |
|-------|-------------------------------------|--------------------------------|----------------------------------|---------------------------------|-----------------------|
|       |                                     |                                |                                  |                                 |                       |

<sup>187</sup> National Education Census Report 2021. [Available here](#)

<sup>188</sup> National Education Census Report 2021. [Available here](#)

<sup>189</sup> National Education Census Report 2021. [Available here](#)

| Authority                          | Ministry of General Education and Instruction                               |  |   | MoHEST <sup>190</sup>                      |  |
|------------------------------------|---|--|---|--|--|
| Numbers of schools <sup>191</sup>  | 1,202 <sup>192</sup>  | 5,189 <sup>193</sup>   | 606 <sup>194</sup>  | 62 <sup>195</sup>                          | 6,997  |
| Numbers of students <sup>196</sup> | Total: 172,661<br>Male: 88,744<br>Female: 83,917<br>GER: 11.7%<br>NER: 6.7% | Total: 1,907,976<br>Male: 1,010,363<br>Female: 897,613<br>GER: 59.4%<br>NER: 35.5% | Total: 149,671<br>Male: 84,509<br>Female: 65,162<br>GER: 11.9%<br>NER: 4.6% | Total: 3,054<br>Male: 1,254<br>Female: 800 | Total: 2,230,308<br>Male: 1,164,269<br>Female: 1,066,039 |
| Number of teachers <sup>197</sup>  | Total: 4,038<br>Male: 1,474<br>Female: 2,564                                | Total: 46,782<br>Male: 39,561<br>Female: 7,221                                     | Total: 6,644<br>Male: 6,127<br>Female: 517                                  |  | Total: 57,464<br>Male: 47,162<br>Female: 10,302          |

### The Alternative Education System

The non-formal education system is designed to provide flexible education programmes to various population groups excluded from the formal education system. Decades of civil war have resulted in generations of children and youth who have never had the opportunity to attend school.<sup>198</sup> Following independence in 2011, the government committed to providing IDPs and returnees with their right to education.<sup>199</sup> Therefore, to respond to these challenges, the MoGEI through the Directorate of Alternative Education System, developed the Alternative Education System (AES) policy which articulates the strategies required in developing a literate nation.<sup>200</sup>

The AES consists of six programmes: Alternative Education Programmes (ALP), Community Girls School (CGS), Pastoralist Education Programme (PEP), Basic Adult Literacy Programme (BALP), Intensive English Course (IEC) and South Sudan Interactive Radion Instruction (SSIRI).<sup>201</sup> These programmes offer equitable access and relevant quality learning opportunities for overage and out-of-school children,

<sup>190</sup> MoHEST – Ministry of Higher Education Science and Technology

<sup>191</sup> National Education Census Report 2021. [Available here](#)

<sup>192</sup> 145 of 1,202 are not operational (schools that had been closed due to a variety of reasons).

<sup>193</sup> 963 of 5,189 are not operational.

<sup>194</sup> 105 of 606 are not operational.

<sup>195</sup> 27 of 62 not operational.

<sup>196</sup> National Education Census Report 2021. [Available here](#)

<sup>197</sup> National Education Census Report 2021. [Available here](#)

<sup>198</sup> South Sudan Alternative Education System Policy. [Available here](#)

<sup>199</sup> South Sudan Alternative Education System Policy. [Available here](#)

<sup>200</sup> South Sudan Alternative Education System Policy. [Available here](#)

<sup>201</sup> South Sudan Alternative Education System Policy. [Available here](#)



youth, and adults.<sup>202</sup> According to the 2021 National Education Census, a total of 93,192 students (52% male and 48% female) were enrolled in AES programmes.<sup>203</sup>

### Teacher Training

The MoGEI is responsible both for teacher education and for pre-service curriculum development. According to the 2021 National Education Census report, South Sudan has a total of 60,771 teachers in basic and secondary education (82% male and 28% female). 51% of these teachers were untrained.<sup>204</sup> To improve this situation, the MoGEI in 2021 developed a curriculum for teacher training, with both in-service and pre-service options, that leads to Qualified Teacher Status (QTS).<sup>205</sup>

The pre-service training option is delivered by the Teacher Training Institutes (TTIs) but assessment and certification are conducted by the College of Education at the University of Juba.<sup>206</sup> There are seven TTIs in South Sudan but only three are operational. These are Maper NTTI, Maridi NTTI and Rombur NTTI.<sup>207</sup> On the other hand, the in-service training option is delivered to unqualified serving primary school teachers by University of Juba. This programme is also offered by Yei Teacher Training College, a private college, with approximately 1,500 in-service teachers enrolled.<sup>208</sup>

### 3.1.4 Policy landscape

Key stakeholders in South Sudan involved in the formulation and implementation of policies are described in the table below.

| Institution  | Responsibility  |
|--|---|
| Ministry of Environment and Forestry (MoEF)                  | The lead institution responsible for formulation of policies, regulations, and plans for the environment, forestry and biodiversity protection and management and climate change mitigation and adaptation in South Sudan. The Ministry is also the technical and operational focal point for international environmental conventions and treaties. |
| Ministry of General Education and Instruction (MoGEI)        | Leads the development of policies and plans in the primary and secondary education sector. The Ministry also includes a Unit under which construction is managed.   |
| Ministry of Higher Education Science and Technology (MoHEST) | Leads the development of policies and plans in the higher and tertiary education sector and responsible for teacher professional development.   |
| Ministry of Finance and Economic Planning (MoFEP)            | Budgetary allocation to all sectors.<br>Disbursement of approved funds.<br>Enforcement of financial regulation.   |

<sup>202</sup> South Sudan Alternative Education System Policy. [Available here](#)

<sup>203</sup> National Education Census Report 2021. [Available here](#)

<sup>204</sup> National Education Census Report 2021. [Available here](#)

<sup>205</sup> UNESCO. Teacher Education in South Sudan with Emphasis on Foundational Literacy and Numeracy Skills. [Available here](#)

<sup>206</sup> UNESCO. Teacher Education in South Sudan with Emphasis on Foundational Literacy and Numeracy Skills. [Available here](#)

<sup>207</sup> UNESCO. Teacher Education in South Sudan with Emphasis on Foundational Literacy and Numeracy Skills. [Available here](#)

<sup>208</sup> UNESCO. Teacher Education in South Sudan with Emphasis on Foundational Literacy and Numeracy Skills. [Available here](#)

|  |   |
|--|---|
| Ministry of Gender, Child & Social Welfare (MoGCSW)              | Support of vulnerable groups (children, elderly, PWDs).   |
| Ministry of Humanitarian Affairs and Disaster Management (MHADM) | Development of legal and policy framework guiding disaster risk reduction (DRR) and management.<br>Lead agency for the coordination of all DRR activities.                    |
| Relief and Rehabilitation Commission (RRC)                       | Implementation of all Relief and Rehabilitation Programs.   |
| Directorate of Disaster Management                               | Directorate under MHADM.<br>Articulates the disaster management priorities and process and facilitates comprehensive policy implementation.                                   |
| Directorate of Early Warning                                     | Directorate under MHADM.<br>Establishes disaster early warning and early response systems (EWER).   |
| UN Agencies: UNDP, UNICEF, UNESCO, UNOCHA, UNHCR, WFP            | Develops international frameworks that guide policy formulation processes.<br>Provides financial and technical support during the development and implementation of policies. |
| Donor Agencies; USAID, UKAid, EU, World Bank, GPE, Norad         | Provide financial support and technical assistance to national agencies and ministries.   |
| NGOs – local and international                                   | Provides technical support during policy development.<br>Implements interventions that align with policy ambitions.   |

South Sudan has ratified the relevant international frameworks for combating climate change. These include:

- Sustainable Development Goals
- United Nations Framework Convention on Climate Change (UNFCCC)
- Paris agreement
- Sendai Framework for Disaster Risk Reduction
- United Nations Convention on Combating Desertification (UNCCD)
- Education for Sustainable Development (ESD) for 2030 framework
- The Africa Regional Strategy for Disaster Risk Reduction (ARSDRR)
- Convention of the Rights of the Child and General Comment 26

### **National policies**

Several national laws and policies designed to facilitate the integration of climate change across different sectors in South Sudan are outlined in this section. This is followed by a review of policies

whose primary objective is to address climate change issues. The sub-section concludes by looking at education sector specific policies and strategy and the extent to which they reference climate change.

The Transitional Constitution of the Republic of South Sudan 2011 directs the government of South Sudan, at all levels, to protect and ensure the sustainable management and utilization of natural resources including land, water, petroleum and minerals for the benefit of the people.<sup>209</sup> The constitution in articles 41 (1), (2) and (3) offer all South Sudanese communities the right to a clean and healthy environment and requires every individual to conserve the environment for the benefit of present and future generations.<sup>210</sup> Further, the constitution provides every person with the right to have the environment protected through appropriate legislative strategies and other policies that prevent pollution and promote balanced economic and social development.<sup>211</sup>

**The South Sudan Development Plan (SSDP), 2011 – 2016**, was the first national planning document providing guidance on the establishment and development of South Sudan.<sup>212</sup> While the plan did not include climate change adaptation and mitigation strategies, it committed to strengthen the capacity of environmental regulators to ensure investment proposals were subject to environmental screening. This enables an evaluation of a project's potential impact to the natural environment.<sup>213</sup> The plan identified seven important cross-cutting issues, among them the environment. Accordingly, the Government of South Sudan (GoSS) committed to ratify multilateral environmental treaties, conventions, and agreements. The plan tasked the MoGEI to include natural resources concepts, especially principles in agriculture, forestry, livestock, fisheries, wildlife and environmental sciences, in primary and secondary education curricula. The plan acknowledges the need to enhance the use of natural resources in an efficient and environmentally sustainable manner. Consequently, the natural resources sector is considered important in enabling sustainable economic growth and development, enhancing food security, and promoting poverty reduction.<sup>214</sup>

Following the SSDP, the GoSS developed the **National Development Strategy (NDS) 2018 – 2021** in 'a context of conflict, humanitarian crisis, and economic downturn.'<sup>215</sup> The priorities identified in the strategy primarily addressed these challenges and did not cover climate change related issues. Nevertheless, the NDS notes that promoting environmental sustainability, climate resilient communities, and appropriate land use was a critical enabler that would complement the eight strategic priorities of the NDS.<sup>216</sup>

To address the gaps in the NDS, the GoSS developed the **Revised National Development Strategy 2021 – 2024 (R-NDS)**. The R-NDS identifies the need to reverse environmental degradation and mitigate the impact of climate change as a key area of focus. The strategy adds environmental sustainability as the fourth principle for achieving sustainable development and prosperity.<sup>217</sup> Prior to the development of the R-NDS, national consultations identified environment and climate as one of six priority areas to be

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<sup>209</sup> Transitional Constitution of South Sudan. [Available here](#)

<sup>210</sup> Transitional Constitution of South Sudan. [Available here](#)

<sup>211</sup> Transitional Constitution of South Sudan. [Available here](#)

<sup>212</sup> South Sudan Development Plan (2011-2013). [Available here](#)

<sup>213</sup> South Sudan Development Plan (2011-2013). [Available here](#)

<sup>214</sup> South Sudan Development Plan (2011-2013). [Available here](#)

<sup>215</sup> South Sudan National Development Strategy. Consolidate Peace and Stabilize the Economy. [Available here](#)

<sup>216</sup> South Sudan National Development Strategy. Consolidate Peace and Stabilize the Economy. [Available here](#)

<sup>217</sup> Revised National Development Strategy. [Available here](#)

addressed in the strategy. Some of the activities proposed within this priority area include the development of policy for disaster prevention and response, management of the environment, the reduction of carbon footprint and the need to address climate vulnerability.<sup>218</sup> The R-NDS is very closely aligned with the country's Second Nationally Determined Contribution (NDC) which is discussed in the following section.

### *3.1.3.1 Education Policy landscape*

**South Sudan's General Education Policy** (2017 – 2027) identifies environmental education as one of eight cross-cutting issues in education provision.<sup>219</sup> Consequently, the government commits to develop environmentally responsible citizens, and tasks the MoGEI to collaborate with the Ministry of Environment and Forestry (MoEF) to develop a national policy of environmental education as well as raise awareness of the impacts of climate change.

The **General Education Strategic Plan (GESP)** developed four priority programmes during the 2017-2022 implementation period. These are on access and equity; quality; overall management of general education and post-primary TVET.<sup>220</sup> To enable the operationalization of the third priority programme (overall management of general education), the strategy tasks the MoGEI to provide coordination in the provision of education in emergencies, through the development of a strategy that strengthen its preparedness and response capacities. This includes identifying Education in Emergencies (EiE) focal persons from directorates at central and state-levels who will be trained on Disaster Risk Management (DRM).<sup>221</sup> The General Education Strategic Plan recognizes climate change as one of the challenges facing education provision in South Sudan.<sup>222</sup> Therefore, the GESP is set up to contribute to the realization of the SDGs. The sector plan tasks the MoGEI to work with partners to ensure new classrooms are constructed on sites that are free from hazards such as floods and unexploded landmines.<sup>223</sup>

The **National Teacher Education Policy** states that teachers should be trained to address the cross-cutting issues within the general education curriculum including environmental awareness and sustainability.<sup>224</sup> However, the policy does not provide further details on the approaches through which this would be done.

The **South Sudan Education Cluster Strategy** (2023 - 2025) provides a framework for providing protective and inclusive education for children and youth affected by crisis.<sup>225</sup> The strategy commits to train School Management Committees (SMC), Parent Teacher Associations (PTA), and education authorities on school management, governance, climate change, and Disaster Risk Reduction (DRR).<sup>226</sup>

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<sup>218</sup> Revised National Development Strategy. [Available here](#)

<sup>219</sup> South Sudan General Education Policy (2017 – 2027). [Available here](#)

<sup>220</sup> The General Education Strategic Plan (2017 – 2022). [Available here](#)

<sup>221</sup> The General Education Strategic Plan (2017 – 2022). [Available here](#)

<sup>222</sup> The General Education Strategic Plan (2017 – 2022). [Available here](#); While the implementation period of this GESP has run its course, it was not clear if there is a new plan in place, or if one is currently in formulation.

<sup>223</sup> The General Education Strategic Plan (2017 – 2022)

<sup>224</sup> South Sudan National Teacher Education Policy. [Available here](#)

<sup>225</sup> South Sudan Education Cluster Strategy (2023 – 2025). [Available here](#)

<sup>226</sup> South Sudan Education Cluster Strategy (2023 – 2025). [Available here](#)

The **Humanitarian Response Plan 2023** responds to the challenges faced by the education sectors following protracted conflict and climate change crises.<sup>227</sup> The plan requires the Education Cluster to prioritize and support vulnerable children affected by conflict and climate change, in locations with the highest rates of EiE needs for children and schools in the host communities accommodating an influx of newly displaced children. This includes internally displaced children, children with disabilities, out-of-school children, young mothers, caregivers, and education personnel. The plan equally responds to climate change-related effects including drought and flooding, disease outbreaks, among others.<sup>228</sup>

The **South Sudan curriculum framework** establishes four key aims that underpin all learning.<sup>229</sup> These include the development of environmentally responsible people who are committed to sustainable forms of development, aware of the importance of environmental sustainability, and appreciative of the need to preserve the environment. To achieve these aims, the curriculum is based on an active approach to learning. Further review of the contents of the curriculum and the extent to which climate change education content is integrated is discussed in below.

**The Education Sector Plan (ESP), 2023** The risk analysis within the MOGEI, Education Sector Analysis (ESA) 2023 identified diverse risk factors in South Sudan, spanning natural hazards and conflict. Notably, the Greater Upper Nile region exhibited both elevated risk levels and pronounced dropout rates, indicative of a correlation between vulnerable areas and educational retention challenges. To establish a resilient education system, the GESP will prioritize risk adaptation. Specifically, the following adaptation and environmental sustainability measures were included in the Ministry's recently-developed ESP, 2023.

| Education Sector Plan activities   |
|--|
| Develop contingency plans at the national and sub-national levels based on local hazards                                       |
| Review and update the South Sudan Minimum Standards for Education in Emergencies (INEE) to the current context of South Sudan. |
| Train state and local stakeholders in the South Sudanese Education in Emergency Strategy                                       |
| Review the distance learning through radio programmes***   |
| Develop and provide home learning packages to complement radio learning during emergencies                                     |
| Implement the distance learning through radio programmes   |
| Conduct a study to assess the appropriateness of the academic calendar to cope with climate hazards.                           |
| Expand the in-service and preservice teacher training programme, including on DRR and climate change issues.                   |
| Develop advocacy and awareness campaigns on DRR and climate change   |
| Implement advocacy and awareness campaigns on DRR and climate change   |
| Create a reserve/contingency budget for disaster prevention, mitigation, response, and recovery                                |

<sup>227</sup> South Sudan Humanitarian Response Plan 2023. [Available here](#)

<sup>228</sup> South Sudan Humanitarian Response Plan 2023. [Available here](#)

<sup>229</sup> South Sudan Curriculum framework. [Available here](#)

|  |
|--|
| Appoint and train a focal person within the office of coordination for disaster risk reduction and climate change in all SMOGEIs, AAs and a unit within MoGEI                                    |
| Establish an early warning communication system/chain between MHADM, MoGEI DRR focal points at decentralized levels  |
| Motivate the teaching workforce, focusing on teacher wellbeing, gender equity, and risk-affected areas (see the section on curricula and teacher professional development for more information). |
| Review and update the construction standards and guidelines of primary schools to be climate resilient   |
| Develop the construction standards and guidelines for secondary schools to be climate resilient (see the section on infrastructure for more information)   |
| Improve monitoring and evaluation of schools, sector policies and plans including DRR/climate change.  |

It is important to mention that this plan “will confront these challenges by implementing targeted initiatives and policies aimed at bolstering primary school accessibility in regions facing pronounced disadvantages, particularly those vulnerable to conflict and natural disasters, such as **Unity, Eastern Equatoria, Upper Nile, and Jonglei states**” (MOGEI, ESP,2023).

### 3.1.3.2 Climate change policies

South Sudan developed its **National Adaptation Programme of Action (NAPA) in 2016** to communicate its priorities in dealing with the impacts of climate change to the United Nations Framework Convention on Climate Change (UNFCCC).<sup>230</sup> To achieve the objectives outlined in the R-NDS, the NAPA aimed to identify potential adaptation activities, formulate priority adaptation projects, build capacity for adapting to longer-term climate change and variability, and raise public awareness on the urgency to adapt to the adverse effects of climate change. The five sectors in which priority adaptation projects will be implemented are environment, water resources, agriculture, DRR, and policy and institutional frameworks (see the table below).<sup>231</sup>

| Sector                             | Adaptation projects  |
|------------------------------------|--|
| Environment                        | Promote reforestation and agroforestry to reduce vulnerability to droughts and floods.   |
| Water resources                    | Promote the sustainable management and conservation of wetlands.   |
| Agriculture                        | Promote climate-smart agricultural techniques that will improve livelihoods and food security under changing climatic pattern. |
| Disaster Risk Reduction            | Promote the establishment of improved drought and flood Early Warning Systems.   |
| Policy and institutional framework | Strengthen the institutional capacity of the GoSS to integrate climate change into national policies and planning processes.   |

<sup>230</sup> National Adaptation Programme of Action. [Available here](#)

<sup>231</sup> National Adaptation Programme of Action. [Available here](#)

The second **Nationally Determined Contributions (NDC)**, formulated in 2021, identifies 14 sectors and includes both adaptation and mitigation strategies for each. These are: agriculture, livestock and fisheries, infrastructure, forestry, biodiversity, ecosystem and sustainable wetland management, and disaster risk management among others.<sup>232</sup> The NDC notes that if the proposed sectoral strategies are implemented, then South Sudan's decarbonization strategy will be compatible with the Paris Agreement's goal of limiting global temperature rise to below 2°C.<sup>233</sup> The NDC does not include a special focus on education, but identifies climate change activities, that can be integrated into the curriculum, such as increasing the understanding of climate change broadly as well as upgrading school infrastructure to be more resilient to climate change impacts.<sup>234</sup>

The **National Environment Policy (2015 – 2025)** was developed to protect and conserve the environment and ensure natural resources are used in an efficient and sustainable way.<sup>235</sup> While this policy is not available publicly, the NDC provides a detailed overview of its objectives which include developing regulations and guidelines for sustainable management of the environment, integrating environmental concerns into development policies, building capacities of state and regional institutions in efficient environmental management, and promoting public participation in conservation and sustainable management of resources.<sup>236</sup> Additionally, the policy recognizes climate change as a concern that is likely to have an adverse impact on the livelihoods of South Sudanese people and advocates for development of strategies and measures for climate change mitigation and adaptation.<sup>237</sup>

The **Comprehensive Agricultural Master Plan (CAMP) 2015 – 2040**,<sup>238</sup> is one of the comprehensive technical documents that was developed to guide the development of the agricultural sector in South Sudan. The CAMP is an investment plan covering five subsectors (crops, livestock, fishery, forestry, and institutional development) for effective and efficient agricultural development by all stakeholders engaged in agricultural development in South Sudan. The master plan consists of over 110 sub-sector projects that have been identified with the aim of ensuring food security, improving livelihoods of communities, and promoting sustainable agriculture and livestock rearing practices.<sup>239</sup>

Climate change strategies have also been outlined in various other policies across different sectors in South Sudan. The forest policy emphasizes the need for the implementation of sustainable forest management measures that will enable South Sudan to access international funding under climate financing mechanisms such as REDD+.<sup>240</sup> This funding will go into climate adaptation and mitigation activities. The 2015 National Electricity Policy identifies transition to sustainable energy for all South Sudanese to be a government priority and one that can be achieved through public-private partnerships.

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<sup>232</sup> Second Nationally Determined Contributions (2021). [Available here](#)

<sup>233</sup> Second Nationally Determined Contributions (2021). [Available here](#)

<sup>234</sup> Second Nationally Determined Contributions (2021). [Available here](#)

<sup>235</sup> Second Nationally Determined Contributions (2021). [Available here](#)

<sup>236</sup> Second Nationally Determined Contributions (2021). [Available here](#)

<sup>237</sup> Second Nationally Determined Contributions (2021). [Available here](#)

<sup>238</sup> The Comprehensive Agricultural Master Plan (2015–2040). [Available here](#)

<sup>239</sup> The Comprehensive Agricultural Master Plan (2015–2040). [Available here](#)

<sup>240</sup> The Policy is unavailable publicly, but has been referenced in several government documents including the NDC, the NAP and [here](#); REDD+ stands for 'Reducing Emissions from Deforestation and forest Degradation in developing countries. Countries established the 'REDD+' framework to protect forests as part of the Paris Agreement.



The **National Biodiversity Strategy and Action Plan 2018-2027 (NBSAP)**<sup>241</sup> recognizes climate change as a major threat to biodiversity and environmental sustainability and a challenge for improving biodiversity management efforts. The strategy observes that high climate variability and the low adaptive capacity for most of the population in South Sudan will lead to more indirect impacts on biodiversity. Climate change may increase phenomena such as fire, drought, and floods and might aggravate already existing threats to ecosystems or individual species.<sup>242</sup> Consequently, climate change is relevant to all seven strategic objectives of the NBSAP, hence implementation of the NAP process in building climate resilience will address many of the priorities identified in the NBSAP.<sup>243</sup>

The **Ministry of Humanitarian Affairs and Disaster Management (MHADM)** is responsible for the development of an effective and responsive disaster management strategy. The MHADM strategic plan (2018 – 2020) recognizes disaster preparedness and management as a cross-cutting activity in every sector of the South Sudan society.<sup>244</sup> The development of the strategy is guided by the Sendai Framework which advocates for the promotion of a systematic approach in reducing vulnerabilities and risks to hazards. The plan aims to address the key challenges in disaster preparedness and management facing the country by identifying six priority areas of action. These include the development of a DRM policy and risk assessment tools, the strengthening of capacity of the ministry personnel in disaster management and increasing funding and investment in disaster preparedness.

The plan identifies several key challenges facing the sector. These include lack of National Disaster Risk Management Policy; inadequate financial resources; poor coordination with partner agencies; lack of expertise in Early Warning and Early Response (EWER) mechanism; lack of relevant tools and equipment for detecting threats among others. To alleviate these challenges, the plan recommends recruitment and training of expertise in disaster management along with the strengthening of capacity of staff in DRR, Monitoring and Evaluation, EWER mechanism, communication skills etc. The progress of implementation of these activities has not been provided in any publicly available documents, and stakeholder consultations confirmed that while some basic systems are in place, they require further strengthening to be running sufficiently.

The strategic plan notes that there is need for a shift in strategy for DRM from relief and other short-term measures to an approach that is long-term and multi-sectoral.<sup>245</sup> As such, the plan provides a comprehensive list of stakeholders from whom cooperation and support would be crucial. These include both the MoGEI and the MoHEST.<sup>246</sup> In general education, the plan proposes the integration of DRR in education curricula. Further, it also recommends the integration of both indigenous environmental management practices into modern scientific practices in the development of disaster prevention programmes.<sup>247</sup>

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<sup>241</sup> South Sudan National Biodiversity Strategy and Action Plan (2018-2027). [Available here](#)

<sup>242</sup> South Sudan National Biodiversity Strategy and Action Plan (2018-2027). [Available here](#)

<sup>243</sup> South Sudan National Biodiversity Strategy and Action Plan (2018-2027). [Available here](#)

<sup>244</sup> MHADM strategic plan (2018 – 2020). [Available here](#)

<sup>245</sup> MHADM strategic plan (2018 – 2020). [Available here](#)

<sup>246</sup> MHADM strategic plan (2018 – 2020). [Available here](#)

<sup>247</sup> MHADM strategic plan (2018 – 2020). [Available here](#)

### 3.1.4 Complementary projects and initiatives

The development of the BRACE project in South Sudan included a wide range of consultations with other actors in South Sudan. BRACE has been designed to build on and complement a range of current and recently completed projects. A table of key investments relevant to BRACE is provided below, with information on how BRACE will be complementary and coherent and prevent duplication and overlap.

| Project details   | Description   | Points of complementarity   |
|---|---|---|
| <b>Title: Multi Year Resilience Programme (MYRP)</b><br><b>Dates of the project: 2023 - 2026 (Phase II)</b><br><b>Total USD: 40M</b><br><b>Donor: Education Cannot Wait (ECW)</b> | The overall programme aims to enhance safe, equitable, and uninterrupted access to quality learning opportunities for crisis-affected children, improve teaching and learning quality through inclusive approaches, promote inclusivity in education, enhance education system resilience, and mobilize resources for programme implementation and crisis response. | Climate activities include: <ul style="list-style-type: none"> <li>• construction and rehabilitation of schools (30% under ECW)</li> <li>• DRR (child-led DRR, campaigns, environmental clubs, activities like tree planting, environmental protection, involve communities and Parent Teacher Association in awareness/ preparedness, school safety plans)</li> <li>• Institutional latrine construction</li> <li>• Rainwater catchment at institutional level</li> <li>• Drilling of new boreholes</li> <li>• CHAST (child hygiene sanitation transformation), includes waste management (mainly organic)</li> </ul>  |
| <b>Title: Accelerated Funding Flood Response</b><br><b>Dates of the project: 2023-2024</b><br><b>Total USD: 10M</b><br><b>Donor: GPE</b>  | 18 months GPE Accelerated Funding flood response funding is integrated in delivering on the MYRP programme, with focus on rehabilitation of infrastructure.   | Climate activities include: <ul style="list-style-type: none"> <li>• Institutional latrine construction</li> <li>• Rainwater catchment at institutional level</li> <li>• Drilling of new boreholes</li> <li>• Hygiene promotion</li> <li>• CHAST (child hygiene sanitation transformation), includes waste management (mainly organic)</li> <li>• Capacity building PTA and SMC teachers on DRR/Climate Change Adaptation (CCA)</li> <li>• Risk mapping and assessments, preparedness and contingency plans</li> <li>• Early Warning Information</li> <li>• Gender inclusive CCA, awareness and sensitisation</li> <li>• DRR/CCA and environmental club formation and actions in schools and communities</li> </ul> |
| <b>Title: Project Improved Accountability and Governance on Children and Youth Rights and Access</b>  | Aims to strengthen community-owned inclusive education, protect children and youth, and empower them to participate in decision-making processes.   | Climate activities include: <ul style="list-style-type: none"> <li>• Child centered DRR (promote environmental conservation, training of teachers, engage children, tree planting, train communities on climate resilient measurements with</li> </ul>  |

|   |  |  |
|---|--|--|
| <b>to Education, Protection and Participation</b><br><b>Dates of the project: 2022-2025</b><br><b>Total USD: 4.5M</b><br><b>Donor: DANIDA</b> |  | <p>involvement of school committee and PTA)</p> <ul style="list-style-type: none"> <li>• Save the Children South Sudan established DRR and climate changed adaptation clubs in DANIDA supported schools, DRR and climate change school committee and social advocacy teams in eight DANIDA supported primary schools.</li> <li>• Anticipatory action (about floods): how can community be involved in response</li> </ul>  |
| <b>Title: Telethon</b><br><b>Dates of the project: 2024-2028</b><br><b>Total USD: 3.6M</b><br><b>Donor: Norwegian fundraising campaign</b>    | <p>Aims to enhance child protection, improve education access, and increase access to child protection services in Kapoeta and Bor South Counties.</p>   |  |
| <b>Title: NORAD Framework Agreement</b><br><b>Dates of the project: 2024-2028</b><br><b>Total USD: 9.2M</b><br><b>Donor: NORAD</b>            | <p>The programme has 5 outcome areas:</p> <ol style="list-style-type: none"> <li>1. Increased enrolment, retention, and transition of learners in schools</li> <li>2. Improved learning outcomes for children in protective and inclusive primary schools and Accelerated Learning Programme centres</li> <li>3. Increased engagement and participation of CSOs and community structures on school management and support for safe, inclusive and quality education</li> <li>4. Reduced vulnerability and exposure to climate and environmental hazards for children and communities.</li> <li>5. Improved school and community capacity to prepare and respond to climate change events.</li> </ol> | <p>Climate activities include:</p> <ul style="list-style-type: none"> <li>• Community and school led risk and vulnerability assessment including hazard mapping in schools and communities prone to climate risks</li> <li>• Facilitate community discussions and training workshops based on climate adaptation, disaster risk reduction and anticipatory and early action protocols</li> <li>• Establish community early warning system and information sharing in collaboration with the local government</li> <li>• Establish and strengthen Community DRR Committees and link them to school DRR clubs</li> <li>• Develop preparedness and contingency plans for schools and communities</li> <li>• Crisis Modifier for responding to floods and/or conflict within the target locations.</li> <li>• Design and roll out green school initiatives (e.g. tree planting, set-up of a school garden, climate and environment focused art and drama sessions, climate campaigns, discussions with local climate and environmental partners from authorities, radio shows, waste cleanup days etc.)</li> </ul> |

|  |  |  |
|--|--|--|
|  |  | <ul style="list-style-type: none"> <li>• Develop waste management and recycling plans with schools and local government (plastic reduction, recycling paper e.g. for briquette making, glass, organic waste e.g. for composting, grey water use etc.)</li> <li>• Promote waste management and recycling (set up recycling bins for paper, plastic, metal, and glass throughout the school)</li> <li>• Organise annual campaigns and competitions for green schools initiatives</li> <li>• Form and train school environment/climate/DRR clubs to lead on green schools initiatives</li> <li>• Establish and strengthen DRR/CCA coordination mechanisms within schools, communities and local government</li> <li>• Facilitate with MET office, water department, environment department etc.) and humanitarian and development actors</li> <li>• Foster partnerships between schools and local community organizations/ Line departments working on climate-related initiatives</li> <li>• Organise School Exposure learning visits and networking: link different schools in a region for common climate and environment campaigns and events</li> <li>• Train teachers and families to support distance or home-based learning and accelerated learning during disruptions due to natural hazards</li> <li>• Promote DRR response skills e.g. school and community drills to enhance practical knowledge on the standard operating procedures during emergencies, first aid training, evacuation routes, communication during disasters etc.</li> <li>• Training of teachers on school-based climate change adaptation and mitigation measurements, environmental safeguarding and sustainability, disability inclusion, disaster risk reduction and preparedness, green initiatives etc.</li> </ul> |
|--|--|--|

|  |  |   |
|--|--|---|
|  |  | <ul style="list-style-type: none"> <li>Develop child friendly Information, Education, and Communication (IEC) materials on climate change and support media campaigns led by children, teachers, PTAs/SMCs</li> </ul>   |
| <b>Title: World Bank Building Skills for Human Capital Development in South Sudan</b><br><b>Dates:</b><br><b>Total USD: 56.4 million</b><br><b>Donor: World bank</b> | The Project's development objective is to increase skills development opportunities in teaching and digital agriculture and strengthen capacity for management of the education system.  | The project has two main components that particularly align with BRACE:<br><b>Component 1: Teaching skills to strengthen education delivery</b><br>This component will build the foundations for a scalable and effective teacher professional development system tailored to the context of South Sudan. The component will establish/strengthen mechanisms for (i) preparing new teachers to meet future needs through formal pre-service teacher training; (ii) provide training to in-service teachers (particularly voluntary teachers) to improve their teaching practices; and (iii) provide accelerated secondary education to existing teachers so they may become qualified to teach. It will aim to train a total of 10,000 formal and volunteer teachers with a module on climate change.<br><b>Component 3: Inclusion of refugee and host communities</b><br>This component will support the re-operationalization of schools in refugee hosting areas, including refurbishment and equipment of school facilities, school grants, support to establish a school management committee with parent participation), and recruitment of qualified teachers. |
| <b>Title: Climate Smart Education Systems Strategic Capability Initiative</b><br><b>Dates: 2024-2025</b><br><b>Total USD: 700,000\$</b><br><b>Donor: GPE</b>         | Funded by the Global Partnership for Education (GPE), CSESI seeks to enhance countries' capacities to mainstream climate change adaptation and environmental sustainability into education sector plans, budgets and strategies as well as to enhance education ministry capacity for cross-sectoral coordination on climate and environment-related policy and programming. | The project crucial pillars include: <ul style="list-style-type: none"> <li>A climate risk analysis for the education sector which will cover ten states and three administrative areas in South Sudan.</li> <li>The development of guidelines for a model green school in South Sudan, informed by the Greening Education Partnership's Green School Quality Standards.</li> <li>Support the government in accessing climate finance</li> <li>Light review of its existing Basic School Construction and Guidelines to understand the extent to which these</li> </ul>   |

|  |  |   |
|--|--|---|
|  |  | <p>standards incorporate considerations of climate change</p> <ul style="list-style-type: none"> <li>• A Knowledge, Attitudes and Practice (KAP) survey to understand the current climate change, environment and DRR knowledge, attitudes, and practices – including local indigenous knowledge of children, teachers and community members.</li> <li>• Support the development of a set of contextualized key messages and Standard Operating Procedures (SOPs) for different climate-related emergencies in South Sudan</li> </ul> |
|--|--|---|

### GCF Readiness Proposals

There are no relevant GCF readiness projects within the education and climate sector space. However, two projects listed below could contribute to changes in the overall enabling environment.

| Project Title  | NDA/Accredited Entity/Delivery Partner   | Status                         |
|--|--|--------------------------------|
| <p><b>National Designated Authority (NDA) Strengthening and Country Programming Support for South Sudan through UNEP</b></p> <p>Specifically, the 2018 grant aims to bolster the institutional capacities of the MoEF, the NDA of South Sudan. This involved enabling the MoEF to effectively perform its duties related to the Fund, engaging with regional, national, and sub-national governments, civil society, and private sector stakeholders, and creating a country programme through a multi-stakeholder engagement process.</p> | UNEP   | Activities in-country complete |
| <p><b>Accelerating the financing and implementation of low-carbon and climate-resilient priorities in agriculture and energy for agriculture in African Countries</b></p> <p>The 2021 grant aims to leverage opportunities from key climate change initiatives like the Africa Renewable Energy Initiatives (AREI), the Africa Adaptation Initiative (AAI), and the Adaptation of African Agriculture (AAA) initiative.</p>  | National Council of the Environment for Sustainable Development (CNEDD) – Niger Ernst & Young GmbH | Current                        |

### 3.2 Climate context

South Sudan, one of the youngest and least developed countries globally, faces multifaceted development challenges stemming from decades of political instability, entrenched poverty, and persistent food insecurity, all of which are exacerbated by climate change. With approximately half of

the population living below the national poverty line, the nation ranks among the most fragile states worldwide. Despite its rich agricultural potential, characterized by fertile soils and abundant water resources, food production has been severely hampered by frequent flooding, recurring droughts, and the displacement of millions due to ongoing conflict. Consequently, an estimated 7.5 million people are currently food insecure. While oil exports dominate the economy, contributing nearly 98% of government revenue, about 95% of the population depends on climate-sensitive natural resources, particularly rainfed subsistence agriculture. Rapid population growth, coupled with the expansion of farming and pastoralism, further compounds these challenges, intensifying tensions and fuelling conflict in an already fragile context.<sup>248</sup>

Situated in East-Central Africa, South Sudan is a landlocked country covering approximately 619,745 square kilometres. It shares borders with Sudan to the north, Ethiopia to the east, Kenya to the southeast, Uganda to the south, the Democratic Republic of Congo to the southwest, and the Central African Republic to the west. Since gaining independence from Sudan on July 9, 2011, following decades of civil conflict, South Sudan has struggled with ongoing instability. The country has a population of approximately 11 million people, making it one of the least densely populated nations in Africa. More than 80% of its predominantly rural population engages in subsistence agriculture and pastoralism. Ethnically and linguistically diverse, South Sudan is home to over 60 distinct ethnic communities, with the Dinka and Nuer being the largest groups. While English is the official language, Arabic and numerous local languages are widely spoken.<sup>249</sup>

Despite significant natural resource wealth, including arable land, expansive forests, mineral deposits, and the vital Nile River system, decades of conflict have stunted economic growth and infrastructure development. The White Nile, flowing through the country, is crucial for agriculture, transportation, and water supply, while the Sudd—one of the world's largest wetlands—plays a critical role in regional biodiversity and water regulation. However, these resources face mounting pressures from climate change and developmental challenges. The agricultural sector, although underdeveloped, holds substantial potential with staple crops such as sorghum, maize, and millet, alongside livestock farming, which is integral to livelihoods. High inflation rates, food insecurity, and limited market access continue to undermine economic stability.<sup>250 251</sup>

Since independence, South Sudan has grappled with inter-ethnic conflicts, political instability, and the fragile implementation of a 2018 peace agreement. Climate variability has amplified these challenges, with extreme weather events, including floods and droughts, increasingly threatening livelihoods and food security. However, opportunities exist for sustainable development. By responsibly leveraging its natural resources, investing in renewable energy, and fostering regional cooperation for water resource management, South Sudan could achieve long-term growth and stability. Strategic investments in infrastructure and sustainable agricultural practices, coupled with improved governance and conflict resolution mechanisms, remain critical to overcoming these challenges and unlocking the nation's development potential.

### National climate

South Sudan's climate is shaped by its geographical location in East-Central Africa, straddling the Sahel and tropical savanna regions. The country experiences a tropical climate characterized by a wet and

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<sup>248</sup> International Monetary Fund (IMF). (2023). South Sudan Economic Outlook. Retrieved from <https://www.imf.org>

<sup>249</sup> World Bank. (2023). South Sudan Overview. Retrieved from <https://www.worldbank.org>

<sup>250</sup> United Nations Environment Programme (UNEP). (2021). Environmental Assessment of South Sudan. Retrieved from <https://www.unep.org>

<sup>251</sup> Food and Agriculture Organization (FAO). (2022). Agricultural Resilience in South Sudan. Retrieved from <https://www.fao.org>



dry season, with significant spatial and temporal variations influenced by atmospheric and regional geographic factors.

South Sudan's rainfall is heavily influenced by the movement of the Intertropical Convergence Zone (ITCZ), a low-pressure belt near the equator where trade winds converge. The ITCZ shifts northward and southward throughout the year, determining the onset and duration of the rainy season. The wet season typically lasts from April to October, peaking between May and August. Rainfall decreases from the south, which receives 1,200-1,800 mm annually, to the arid north, which gets about 500-800 mm annually. This variability in precipitation makes the country highly susceptible to both droughts and floods. Excessive rainfall often leads to severe flooding, particularly in the Sudd wetland area, while insufficient rainfall can result in extended dry periods.

Temperatures in South Sudan are consistently high throughout the year, averaging between 26°C and 32°C. The hottest months, March through May, often see daytime temperatures exceeding 40°C. These high temperatures are a result of the country's proximity to the equator and the low elevation of much of the land. Temperature fluctuations are typically greater during the dry season due to the absence of moderating moisture in the atmosphere.

The bimodal seasonal climate significantly influences agriculture, which is a primary livelihood source for over 80% of the population. The wet season supports crop cultivation and pasture growth, while the dry season is critical for post-harvest activities and grazing. However, unpredictable rainfall patterns and prolonged dry spells can disrupt agricultural cycles, leading to food insecurity.

South Sudan is highly vulnerable to climate change, with observed trends showing:

Increased temperatures: Rising temperatures exacerbate evaporation rates, reducing soil moisture and threatening water availability for agriculture and livestock.

Erratic rainfall: More unpredictable rainfall patterns lead to either prolonged droughts or intensified flooding, as seen in recent years.

Intensified extreme weather events: Climate change amplifies the frequency and severity of floods and droughts. For instance, record-breaking floods between 2019 and 2022 displaced millions of people, destroyed crops and disrupted livelihoods.

The Nile River system, including the White Nile and its tributaries, is a critical hydrological feature influencing South Sudan's climate and water resources. The Sudd wetlands act as a natural regulator for flooding, groundwater recharge, and local climate moderation by trapping rainfall and reducing temperature extremes. However, increased rainfall and upstream water management activities (e.g., dam construction) could alter the hydrology of the Nile, with implications for South Sudan's climate and ecosystems.

South Sudan's climate is also affected by broader atmospheric systems such as the Indian Ocean Dipole (IOD) and El Niño-Southern Oscillation (ENSO). Variations in sea surface temperatures in the Indian Ocean influence rainfall patterns over East Africa, often leading to wetter or drier conditions in South Sudan, while La Niña events contribute to heavier rainfall and flooding.

### *Historical climate trends*

South Sudan's climate is shaped by its humid equatorial conditions, characterized by distinct wet and dry seasons. Annual rainfall varies widely across the country, ranging from as little as 200 mm in the southeastern regions to as much as 2,200 mm in the forested areas of Western Equatoria and the highlands. In the northern states, rainfall is more moderate, fluctuating between 700 and 1,300 mm

annually. The rainy season typically spans from April to December, often resulting in seasonal river flooding. Average temperatures remain consistently high throughout the year, ranging from 26°C to 32°C.

Over recent decades, significant changes in South Sudan's climate have been observed. Rainfall patterns have become increasingly variable, with notable shifts in both the amount and timing of precipitation from year to year. Compared to the high rainfall levels of the 1970s, there has been a general decline of 10 to 20 % in overall precipitation. Despite this, data from 1980 to 2020 reveals a statistically significant upward trend in annual rainfall, with a modest increase of 2.41% per decade. The average annual precipitation during this period was approximately 952.75 mm, though variability remains high, with current levels fluctuating between 947.96 mm and 995.19 mm.

Wet days—defined as days with measurable rainfall—have also seen a statistically significant rise. On average, there were 82.45 wet days annually from 1980 to 2020, increasing by 1.47 days per decade. Currently, this figure ranges between 82.37 and 84.85 wet days per year. This trend indicates a slight extension in the duration of the rainy season.

At the same time, the Standardized Precipitation-Evapotranspiration Index (SPEI), a measure of drought severity, reveals a growing intensity of drought events. While the average SPEI over the same period was -0.24, this index has shown a non-statistically significant downward trend of -0.13 per decade, with recent values ranging between -0.65 and -0.19. These findings suggest that South Sudan has experienced more frequent and severe droughts, despite the slight overall increase in rainfall.

Adding to these rainfall trends is significant warming over the past 30 years, with the central and southern regions of South Sudan ranking among the fastest-warming areas globally. Station temperatures have risen by as much as 0.4°C per decade, amplifying the challenges posed by climate variability.

Spatially, the annual rainfall distribution shows a clear gradient, with higher rainfall amounts depicted in purple shades concentrated in the southern and southeastern regions, particularly near Kapoeta East. These areas receive the highest precipitation, exceeding 1,750 mm annually. In contrast, the northern and northwestern parts of the country, such as Twic and Rubkona, exhibit lighter blue shades, indicating significantly lower annual rainfall levels, ranging between 300 mm and 500 mm.

The monthly maps provide insights into how rainfall varies across South Sudan over the year. Rainfall is minimal during the dry season, as indicated by the prevalence of light blue shades from December to February, suggesting minimal precipitation across most of the country during these months. From March onwards, rainfall gradually increases, with noticeable intensification starting in April. By June and July, the precipitation is widespread, as shown by darker blue shades extending over larger areas. Peak rainfall occurs in August, when purple hues dominate, particularly in the southern and central regions.

Following August, rainfall begins to recede. September and October still show considerable precipitation, but it gradually reduces in coverage and intensity. By November, the light blue shades return, marking the transition back to the dry season.

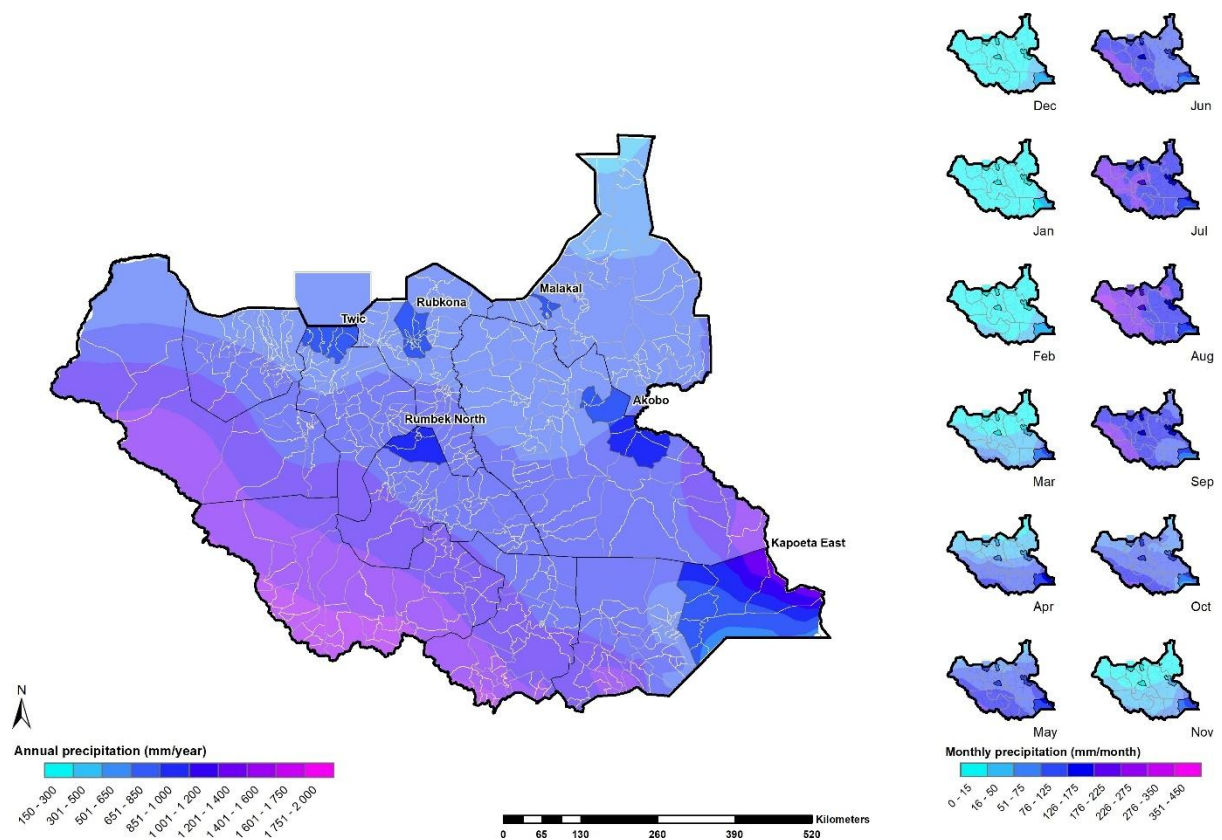
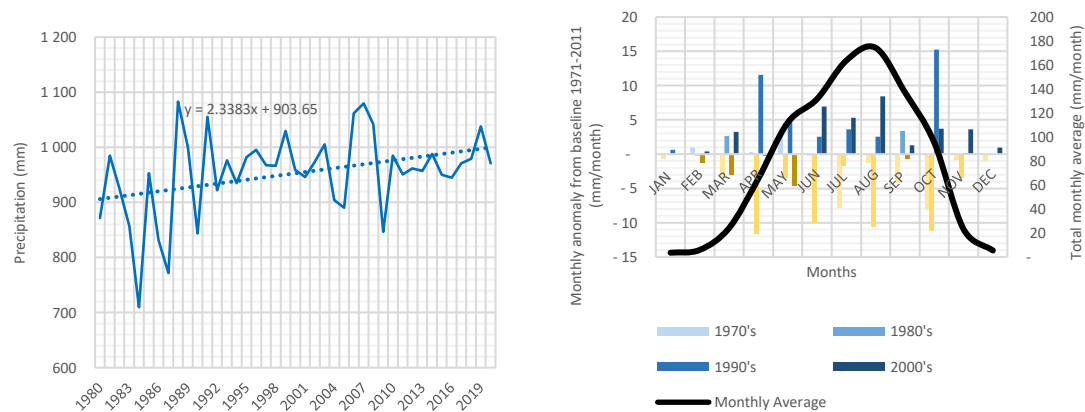


Figure 0-1: Current rainfall volume distribution. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)



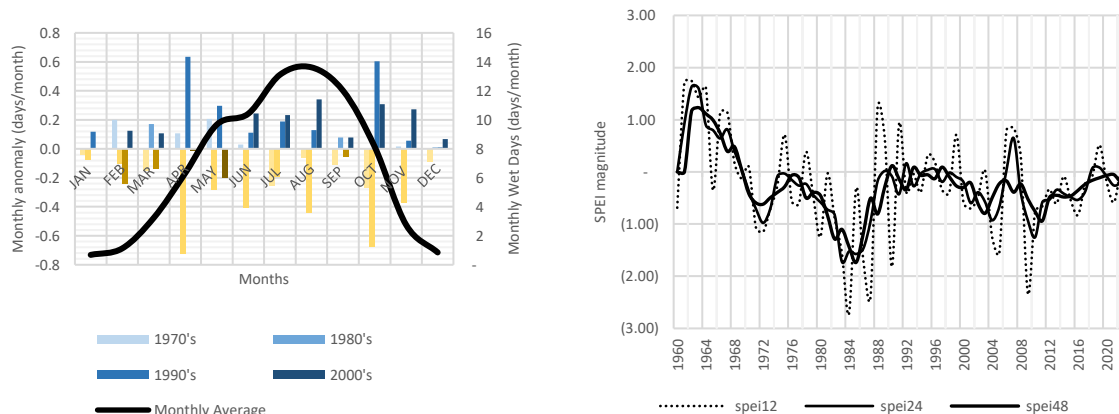


Figure 0-2. Longitudinal change in rainfall parameters from 1980-2020. Annual rainfall (top left), number of wet days (top centre), drought intensity (top right), monthly changes in rainfall (bottom left), and monthly changes in wet days (bottom right)

Table 0-1. Change in rainfall from 1980-2020

|                           | Precipitation (mm)        | Wet days                  | SPEI                          |
|---------------------------|---------------------------|---------------------------|-------------------------------|
| Mean 1980-2020            | 952.75                    | 82.45                     | - 0.24                        |
| 95% confidence interval   | 947.96 - 995.19mm         | 82.37 - 84.85 days        | -0.65 - -0.19                 |
| Trend                     | Statistically Significant | Statistically Significant | Not Statistically Significant |
| Trend (change per decade) | 2.41%                     | 1.47 days                 | -0.13                         |

The provided maps illustrate the spatial distribution of flooding and extreme rainfall events across South Sudan. The main map depicts the annual average 1:100-year flood severity, while the smaller maps showcase specific rainfall-related metrics, including monthly precipitation peaks, days with rainfall exceeding 20 mm, maximum one-day rainfall, single-day rainfall intensity, maximum five-day rainfall totals, and the 95th percentile of extreme precipitation events.

The large map reveals that regions in central and eastern South Sudan, such as areas around Rubkona and Akobo, are at higher risk of significant flooding events, as indicated by the purple shading. These areas face flood risks exceeding 550-750 mm in a 1:100-year flood scenario. In contrast, the western and southern parts of the country, such as Twic and Kapoeta East, show lower flood risks, with light blue shading indicating values below 150 mm.

The monthly precipitation peak map highlights areas in the western parts of South Sudan, where peak rainfall exceeds 300-450 mm, shown in purple shades. The northern and eastern regions experience much lower peaks, typically below 150 mm, represented in light blue.

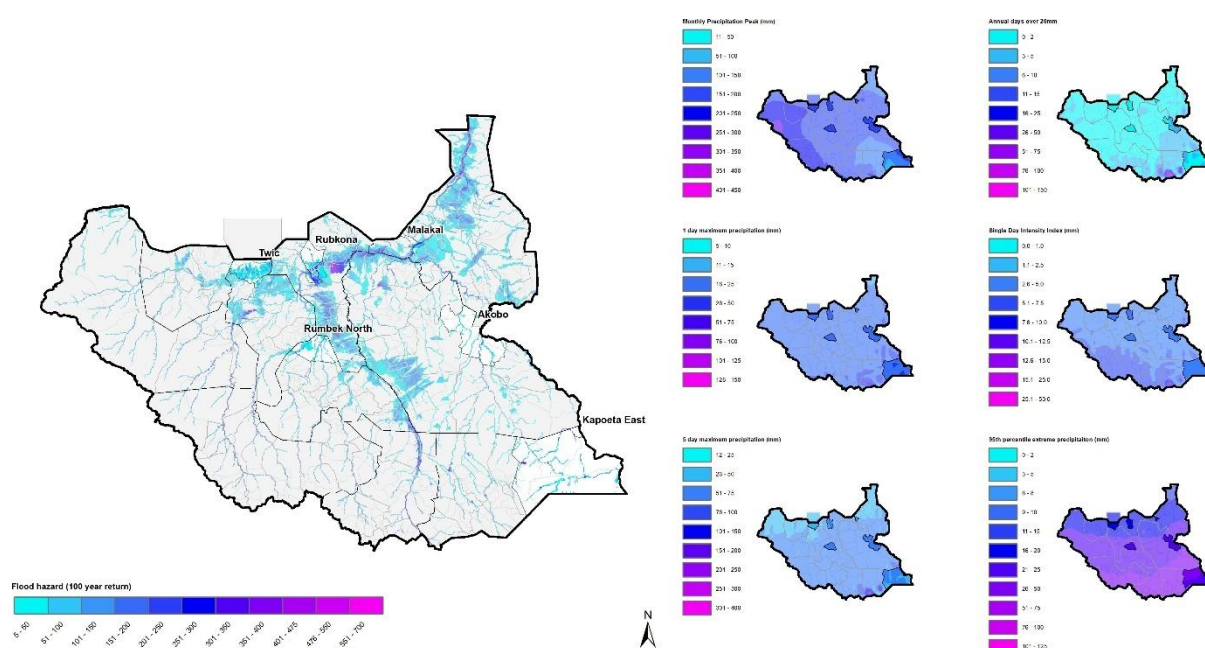
The annual days with rainfall over 20 mm identify a clear gradient. Central and southeastern regions, particularly around Malakal and Kapoeta East, experience more frequent heavy rainfall events, with up to 101-150 days annually in some places. Conversely, the northern areas around Twic see fewer heavy rainfall days, generally fewer than 10 days.

The one-day maximum precipitation reveals the highest single-day rainfall amounts to the southeastern and central regions, such as Kapoeta East and Akobo, experiencing up to 126-150 mm, indicated by darker shading. These levels are significantly higher compared to the northern and western regions, which remain below 50 mm.

The single-day intensity index map demonstrates that rainfall intensity is highest in southern areas, where rainfall volume per event exceeds 25-50 mm. Meanwhile, central and northern regions experience lower intensity, generally below 7.5 mm per rainy day.

The five-day maximum precipitation map highlights similar trends, with southeastern regions, particularly around Kapoeta East, seeing the highest accumulations of up to 301-400 mm. Central areas, such as Rubkona, see moderate levels, while northern parts receive significantly less, below 50 mm.

The 95th percentile extreme rainfall volume reinforces these observations, showing that southeastern regions have the highest extremes, with rainfall volumes exceeding 100-125 mm during the most intense events. Northern areas experience lower extremes, typically between 10-20 mm.



**Figure 0-3: Current flooding and extreme rainfall characteristics.** Flood areas (left), extreme rainfall characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

The large SPEI map highlights areas with varying drought intensities. Regions in the southeastern parts of South Sudan, such as Kapoeta East, exhibit the most severe drought conditions, shown in dark red shades. Moderate drought conditions are observed in central areas such as Rumbek North, while northern regions, including Twic and Rubkona, show less severe drought impacts, with lighter shades of brown.

The precipitation seasonality map indicates significant year-on-year variability in rainfall in northern regions, where seasonality percentages exceed 76% in areas, such as Rubkona and Twic. The areas to the south and east see relatively lower seasonality, with percentages between 41% and 55%, depicted in lighter yellow-orange shades.

The dry spell duration map demonstrates longer dry periods in northern regions as well as southeastern as in the southeast, particularly near Kapoeta East, where dry spells last over 56 days annually, as shown in red. In contrast, south and west areas experience shorter dry spells, generally less than 30 days, indicated by yellow shades.

The map of consecutive dry days reveals similar patterns, with southeastern areas experiencing the longest continuous dry periods, exceeding 176 days per year, shown in dark orange. Central and

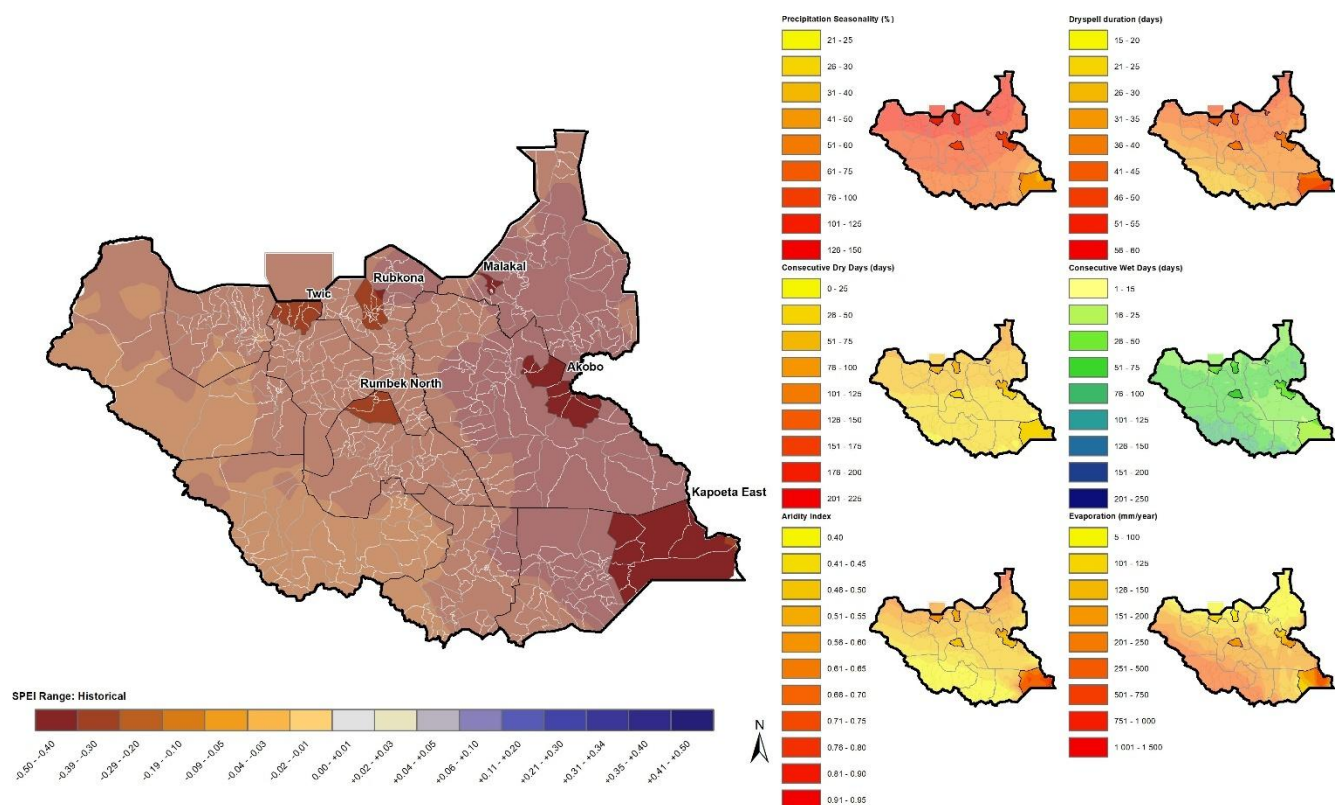


southern regions have shorter consecutive dry periods, generally fewer than 100 days, shown in yellow to orange shades. While areas such as Rumbek North and Twic see moderate consecutive dry days in the north.

The consecutive wet days map shows that the southeastern regions also have fewer consecutive wet days, often fewer than 15 days, indicated by light shades. Central and southwestern areas have slightly longer consecutive wet periods, ranging between 20 and 50 days.

The aridity index map highlights the southeastern part of the country, including Kapoeta East, as the most arid region, with values exceeding 0.91, shown in dark orange to red. Central and northern regions are comparatively less arid, with index values between 0.55 and 0.70, depicted in lighter orange shades.

Finally, the evaporation map shows the highest annual evaporation rates in the southeastern regions, exceeding 1,001 mm per year, shown in dark red. Central and northern areas exhibit lower evaporation rates, ranging between 500 and 750 mm annually, shown in lighter orange shades.



*Figure 0-4: Current Drought and drying rainfall characteristics. Flood areas (left), extreme rainfall characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)*

South Sudan's climate has been experiencing a noticeable warming trend over recent decades, with temperatures steadily rising across all metrics. The minimum temperature, averaging 21.38°C between 1980 and 2020, has shown a statistically significant increase of 0.2°C per decade. This warming of the cooler parts of the day reflects broader shifts in baseline climate conditions.

The mean temperature, observed at around 28°C during the same period, has also risen significantly, with an upward trend of 0.16°C per decade. This consistent warming underscores the broader impact of climate change, affecting average conditions across seasons and regions.

Similarly, the maximum temperature, which averaged 34.69°C from 1980 to 2020, has seen a statistically significant increase of 0.13°C per decade. These rising daytime temperatures contribute to more intense heat, particularly during the hottest times of the year.

The annual average maximum temperature map shows a clear spatial pattern. The highest temperatures, depicted in dark red, are concentrated in the northeast and southeastern regions, particularly around Kapoeta East, where values exceed 37.5°C. Central areas, such as Rumbek North, and northeastern areas, including Malakal and Akobo, experience moderately high maximum temperatures, ranging between 35°C and 37.5°C, indicated by orange shades. In contrast, the southwestern regions, such as parts of Twic and areas along the border, exhibit relatively lower maximum temperatures, shown in yellow, with values ranging from 30°C to 32.5°C.

The monthly maps reveal seasonal variations in maximum temperatures. The hottest months, such as March, April, and May, show widespread dark red shades, indicating maximum temperatures exceeding 37.5°C across much of the country, particularly in central and southeastern areas. During these months, the intensity of heat is most pronounced.

In contrast, the cooler months, such as June, July, and August, display slightly lower maximum temperatures, with yellow shades appearing in southwestern and western regions. These months exhibit maximum temperatures below 30°C in these areas, while central and southeastern regions remain relatively warm, with values between 32.5°C and 35°C.

Toward the end of the year, in months like October and November, maximum temperatures begin to rise again, with the southeastern regions retaining their status as the warmest areas, depicted in orange to red shades. Northern areas, such as Rubkona and Malakal, experienced moderate temperatures during this period.

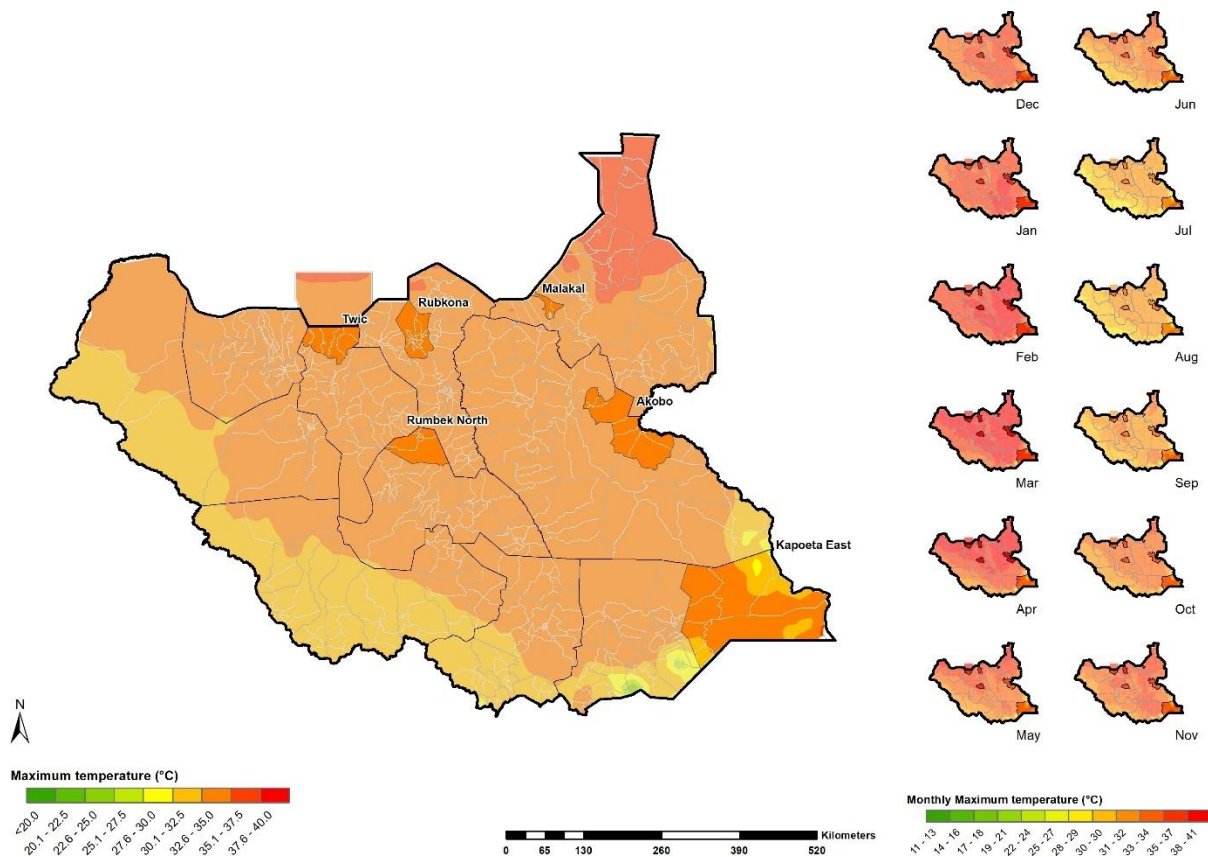




Figure 0-5: Current temperature distribution. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

The annual peak monthly temperature map highlights that the northern regions, particularly Malakal and Akobo, experience the highest temperatures, with values exceeding 41°C. Central areas experience moderately high temperatures ranging between 38°C and 40°C, indicated by pink shading. In contrast, the southern and southeastern areas regions experience lower peak temperatures, generally below 36°C, depicted in red shades.

The warm spell duration shows that the southeastern regions also experience the longest periods of sustained high temperatures, with durations exceeding 13 days, shown in dark purple. Central areas, such as Rumbek North, exhibit moderately long warm spells lasting between 10 and 12 days, while northern and western regions, such as Twic and Rubkona, have shorter durations, generally fewer than 8 days.

The days with maximum temperatures exceeding 35°C further reinforce this pattern. Southeastern areas, particularly around Kapoeta East, experience the highest frequency of hot days, with more than 217 days annually, shown in dark blue. Central regions, such as Rumbek North and Akobo, see between 157 and 185 hot days, depicted in purple shades. Northern regions, including Rubkona and Twic, experience a moderate number of hot days, typically between 65 and 120 days. While the hottest single-day temperature map shows extreme temperature events are most pronounced in northern areas of South Sudan, where temperatures can exceed 45°C, shown in dark blue.

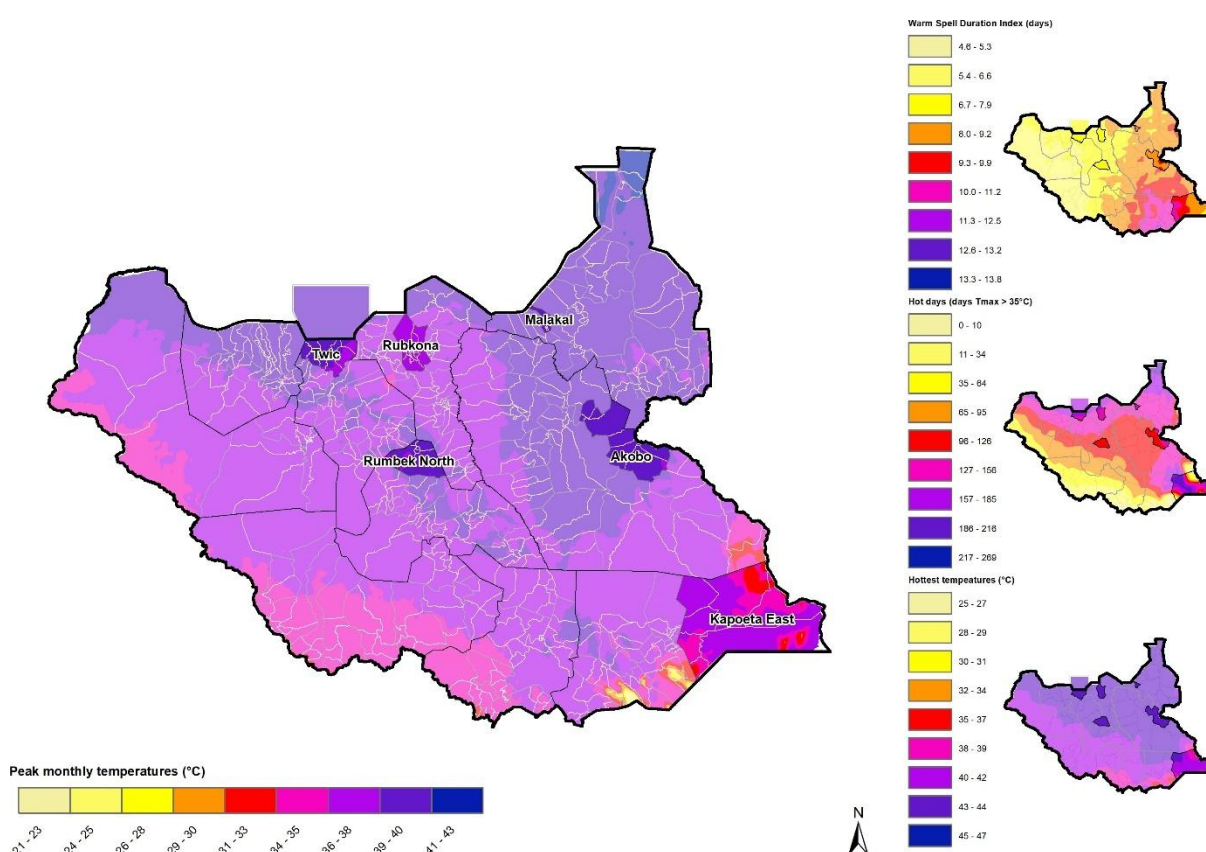


Figure 0-6: Current heatwave and extreme temperature characteristics. Peak monthly temperatures (left), extreme temperature characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

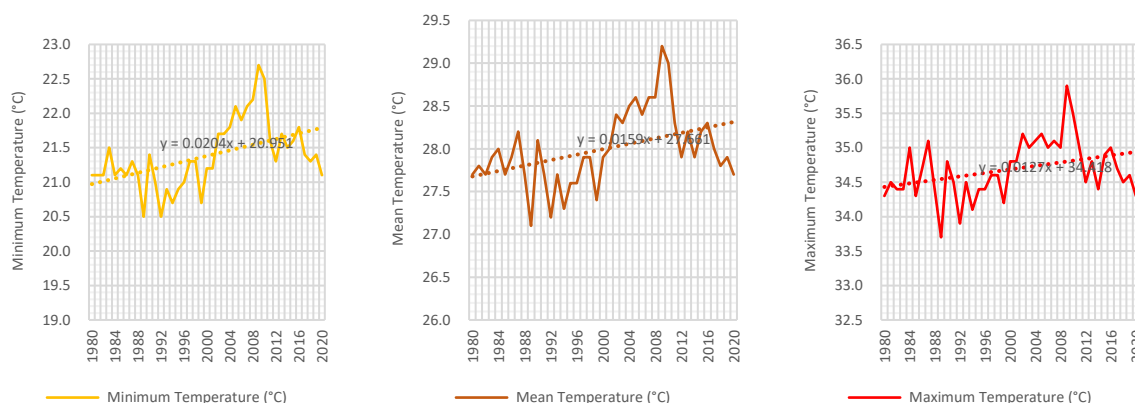


Figure 0-7. Longitudinal change in temperatures from 1980-2020. Minimum (left), Mean (centre), Maximum (right) temperatures

Table 0-2. Change in temperatures from 1980-2020

|                           | Minimum Temperature (°C)  | Mean Temperature (°C)     | Maximum Temperature (°C)  |
|---------------------------|---------------------------|---------------------------|---------------------------|
| Mean 1980-2020            | 21.38                     | 28.00                     | 34.69                     |
| 95% confidence interval   | 21.56 - 21.85°C           | 28.14 - 28.41°C           | 34.79 - 35.05°C           |
| Trend                     | Statistically Significant | Statistically Significant | Statistically Significant |
| Trend (change per decade) | 0.2°C                     | 0.16°C                    | 0.13°C                    |

### Projected climate trends

South Sudan's projected rainfall trends under the SSP2-4.5 scenario from 2020 to 2050 suggest subtle but complex changes in precipitation patterns. The annual rainfall is expected to average approximately 1,236.08 mm, with a slight upward trend of 0.52% per decade. While this increase is not statistically significant, annual totals are projected to range between 1,242.12 mm and 1,257.39 mm.

Rainfall extremes are anticipated to intensify. The peak one-day maximum rainfall is projected to increase significantly, rising by 0.28 mm per decade to reach between 24.21 mm and 24.56 mm. Similarly, the five-day maximum rainfall is expected to show a statistically significant rise of 0.87 mm per decade, with totals projected to range between 67.34 mm and 68.24 mm. Monthly rainfall extremes also display notable increases, with peak one-month totals projected to rise by 1.82 mm per decade, reaching values between 230.2 mm and 233.05 mm.

The number of days with heavy rainfall (above 20 mm) is projected to increase significantly, averaging 1.92 days annually with a 0.09-day per decade rise, reaching between 2.11 and 2.23 days by mid-century. However, days with exceptionally heavy rainfall (above 50 mm) are expected to remain rare, with no significant change from the current average of 0.01 days per year.

Changes in wet and dry spells are less pronounced. Consecutive wet days are projected to decrease slightly by -0.5 days per decade, ranging between 49.28 and 50.98 days annually, while consecutive dry days may see an insignificant reduction of -0.03 days per decade, remaining around 54.34 to 55.06 days. These shifts suggest continued variability in the patterns and distribution of rainfall.

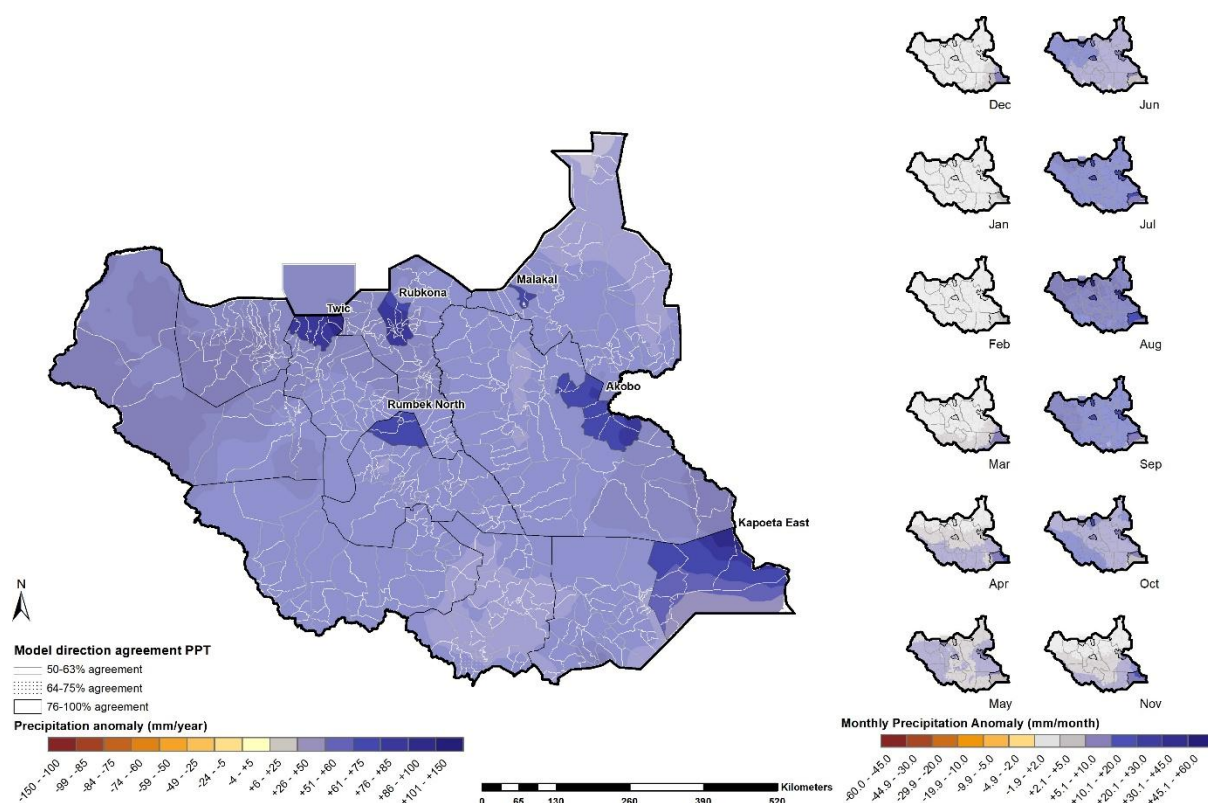
The SPEI drought index, which reflects the balance between rainfall and evapotranspiration, is projected to improve significantly. The index is expected to rise by 0.07 per decade, indicating fewer and less severe drought events, with values ranging between 0.26 and 0.34 by 2050. Despite this, rainfall variability—such as changes in onset, duration, and totals—will likely persist, posing challenges for water management and agriculture.

If current rainfall trends continue, drying impacts may extend into western and northern areas, including West and North Bahr al-Ghazal, Warrap, Unity, Lakes, and Central Equatoria, by 2025. These projections underscore the continued need for adaptive strategies to manage both increases in rainfall extremes and the challenges posed by ongoing variability.

The annual average anomaly map shows a general increase in rainfall across most regions of South Sudan. Southeastern areas, particularly around Kapoeta East, exhibit the most significant projected increases, with anomalies exceeding 100–150 mm annually. Central regions, such as Rumbek North and Akobo, also show moderate increases in rainfall, ranging from 50 to 100 mm annually. In contrast, some areas in the north, such as Rubkona and Twic, experience smaller increases, with anomalies between 0 and 50 mm, shown in lighter purple shades.

The monthly anomaly maps highlight the temporal distribution of these changes. During the dry season months, such as December, January, and February, rainfall anomalies are minimal across most regions, with lighter purple shades indicating only small isolated increases. As the wet season begins in March and April, anomalies start to increase, particularly in southeastern and central regions. By May through August, the anomalies are most pronounced, with darker purple shades dominating southeastern areas, including Kapoeta East. These months see the highest projected increases in rainfall, with some areas experiencing monthly anomalies exceeding 20–50 mm.

In the later months of the wet season, such as September and October, rainfall anomalies remain significant. However, the intensity of the anomalies begins to taper off slightly as the wet season concludes. By November, the anomalies decrease across most areas, with lighter purple shades indicating reduced changes in rainfall patterns.



*Figure 0-8: Projected rainfall volume distribution anomaly. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)*

There is an overall increase in 1:100-year flood severity across much of South Sudan, as shown by the orange and red shading. Central regions, such as Rumbek North and Akobo, show larger and more widespread increases in flood severity, with anomalies ranging from 50 to 100 mm. Northern areas, including Rubkona and Twic, experience moderate increases, with anomalies below 25 mm, shown in yellow shades. Southeastern areas, particularly around Kapoeta East, are projected to experience the most minimal increases in flood severity.

The monthly precipitation peak anomaly map shows the greatest increases in northern regions, where values exceed 25 mm per month. Central areas, such as Rumbek North, show moderate increases ranging between 5 and 25 mm, while southern regions have smaller or negligible changes, with anomalies close to 0 mm.

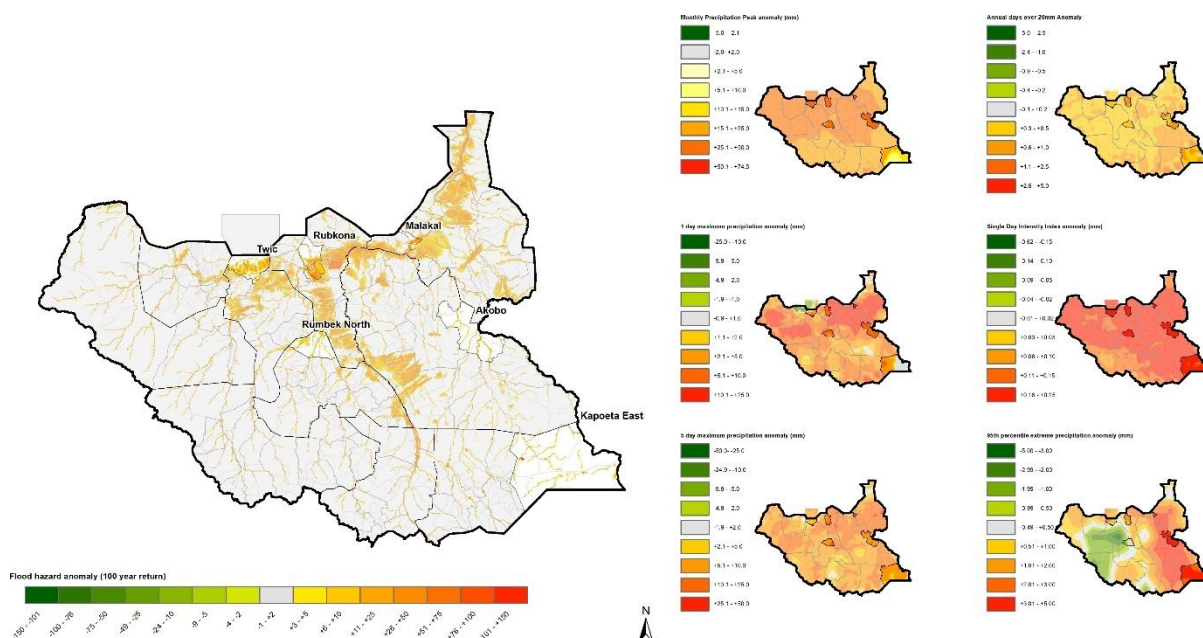
The anomaly annual days with rainfall above 20 mm indicate that eastern areas are projected to see the largest increases in heavy rainfall days, with anomalies of 0.5–1 additional days per year, shown in orange. Central and northern regions experience smaller increases.

The one-day maximum precipitation anomaly highlights that northeastern and northwestern regions are expected to experience the largest increases in single-day rainfall extremes, with anomalies exceeding 10 mm, shown in red. This increased anomaly decreases when moving further south and to the east.

The single-day intensity index anomaly reveals that much of the country will see an increased rainfall intensity. This is largest in the northern and eastern areas while the southwestern areas experience little to no change.

The five-day maximum precipitation anomaly shows similar patterns, with northern areas projected to experience significant increases of over 10 mm. Central areas, such as Rumbek North, see moderate increases, while southern regions experience smaller changes.

The 95th percentile rainfall volume anomaly shows that southeastern regions are expected to see the largest increases in extreme precipitation events, with anomalies exceeding 5 mm. Central areas see moderate increases and decreased volume in the western areas.



*Figure 0-9: Projected flooding and extreme rainfall characteristics. Flood areas (left), extreme rainfall anomaly characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)*

The large SPEI map shows a general decrease in drought intensity across much of South Sudan, as indicated by the dominant blue shading. Southeastern areas, such as Kapoeta East, exhibit minimal reductions in drought severity. The Central and northern regions, including areas around Rumbek North, Rubkona, and Twic, are projected to experience increased SPEI values (lowered drought index), as shown by lighter blue shades.

The precipitation seasonality anomaly map highlights increased variability, particularly in the northern areas. There are increases over most of the country, but these are reduced to the south and negligible to the southeast.

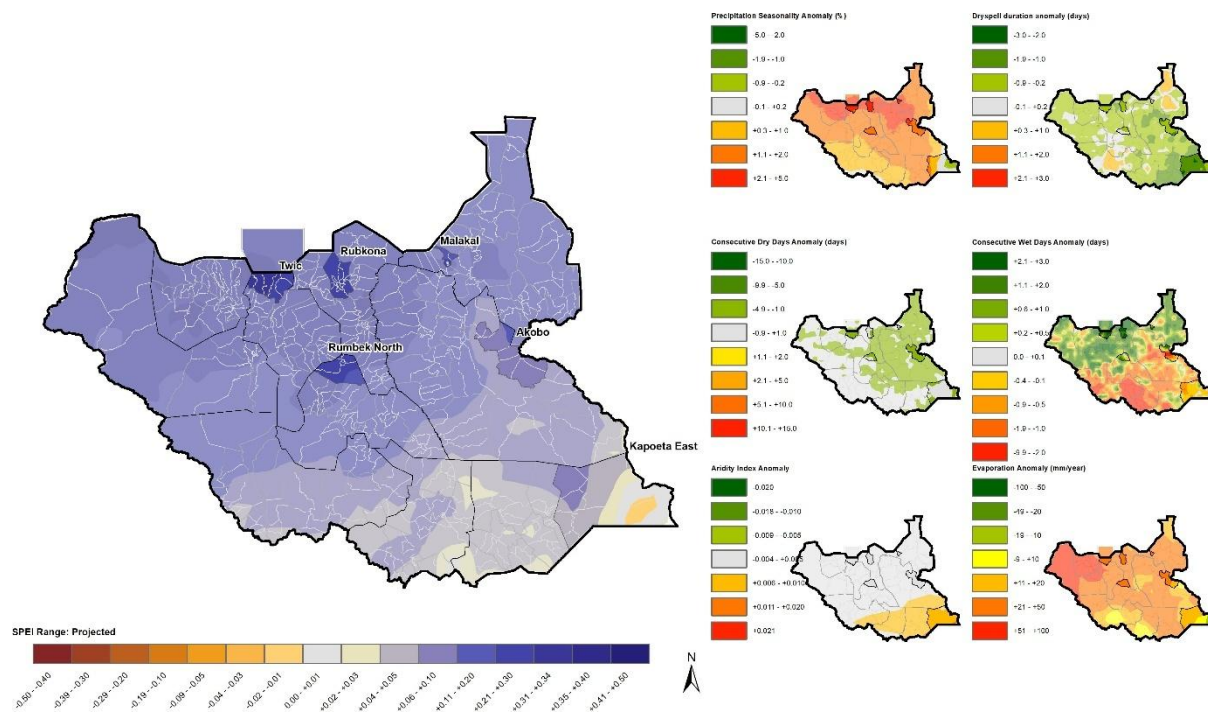
The dry spell duration anomaly map indicates that southeastern regions are expected to experience decreases in the length of dry spells, with anomalies ranging between 2.1 and 3.0 days, shown in green. In contrast, much of the central and northern regions, including areas around Rumbek North and Twic, also exhibit reductions in dry spell duration, but these are more marginal. The consecutive dry day anomaly map shows that northern regions, including Rubkona and Twic, are projected to experience fewer consecutive dry days, with reductions of up to 10 days. Central areas see moderate decreases.

The consecutive wet days anomaly map highlights increased wet periods in central and northern regions, where anomalies exceed 1.0–3.0 days, indicated by green shades. Southern regions, however, show slight decreases in wet days, with anomalies below -2.0 days, shown in yellow and red.

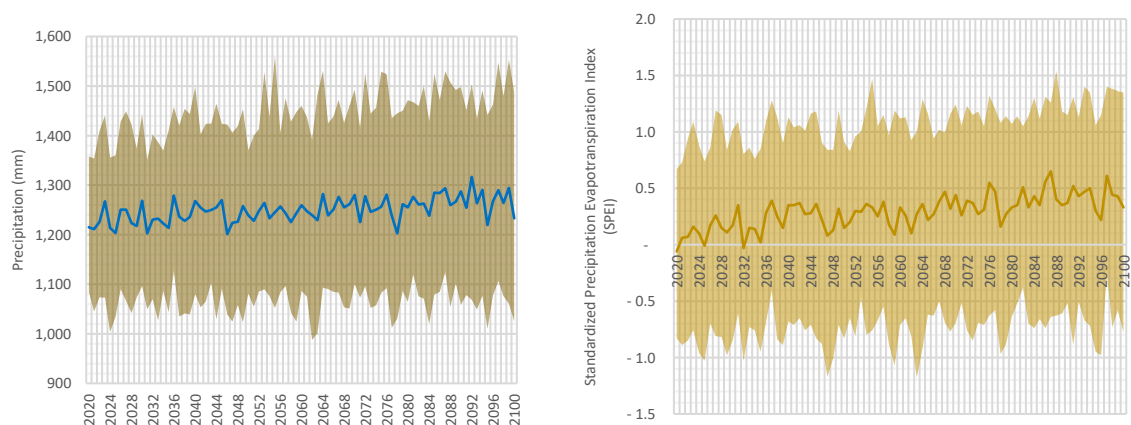


The aridity index anomaly map indicates minor increases in aridity in southeastern regions, such as Kapoeta East, with anomalies exceeding 0.011–0.020, shown in orange. Central and northern areas exhibit little to no change, with values close to zero.

The evaporation anomaly map shows increased evaporation across much of westerner South Sudan, in particular, where anomalies exceed 51–100 mm annually. Central and eastern regions, including areas near Rumbek North, show moderate increases in evaporation.



*Figure 0-10: Projected Drought and drying rainfall characteristics. Flood areas (left), extreme rainfall characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)*



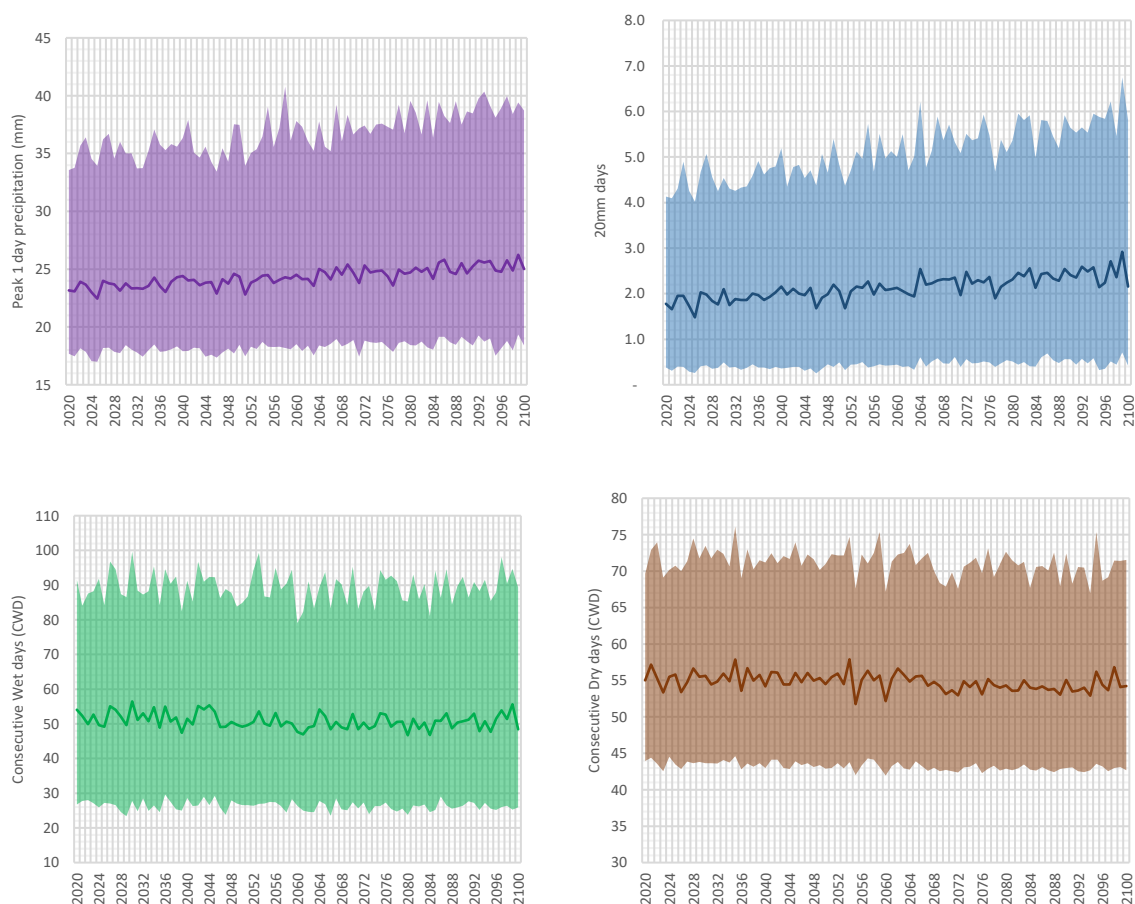


Figure 0-11. Longitudinal change in rainfall parameters from 2020-2100 (SSP2-45). Annual rainfall (top left), SPEI index (top right), Peak 1-day rainfall (middle left), 20mm days (middle right), consecutive wet days (bottom left), and consecutive dry days (bottom right)

Table 0-3. Projected change in rainfall from 1980-2020

|                           | Precipitation        | 1-Day max rainfall | 5-Day max rainfall | 1-Month max rainfall | days above 20mm of rainfall | days above 50mm of rainfall | Consecutive Wet Days | Consecutive Dry Days | drought index |
|---------------------------|----------------------|--------------------|--------------------|----------------------|-----------------------------|-----------------------------|----------------------|----------------------|---------------|
| Mean 2020-2050            | 1 236                | 23.7               | 65.8               | 227.5                | 1.9                         | 0.0                         | 51.8                 | 55.3                 | 0.2           |
| 95% confidence interval   | 1242.12 - 1257.39 mm | 24.21 - 24.56m m   | 67.34 - 68.24m m   | 230.2 - 233.05m m    | 2.11 - 2.23 days            | 0.01 - 0.01 days            | 49.28 - 50.98 days   | 54.34 - 55.06 days   | 0.26 - 0.34   |
| Statistical Trend         | Not Significant      | Significant        | Significant        | Significant          | Significant                 | Not Significant             | Not Significant      | Not Significant      | Significant   |
| Trend (change per decade) | 0                    | 0.28m m            | 0.87m m            | 1.82mm               | 0.09 days                   | 0 days                      | -0.5 days            | -0.03 days           | 0.07          |

South Sudan's climate projections under the SSP2-4.5 scenario indicate a significant warming trend across all temperature parameters from 2020 to 2050. Minimum temperatures are expected to average around 23.66°C, with a statistically significant increase of 0.34°C per decade. Mean temperatures are projected to reach approximately 28.64°C, also rising at a significant rate of 0.33°C



per decade. Similarly, maximum temperatures are expected to average 33.6°C, with a notable increase of 0.32°C per decade.

The lowest minimum temperatures, averaging 18.8°C, are projected to increase significantly by 0.26°C per decade, ranging between 19.58°C and 19.79°C by mid-century. At the other end of the spectrum, the highest maximum temperatures are projected to average 41.16°C, with a significant increase of 0.3°C per decade, reaching between 41.98°C and 42.19°C by 2050.

Heat extremes are also expected to become more frequent. The number of days with temperatures above 25°C is projected to average 364.74 annually, with a slight but statistically significant increase of 0.09 days per decade, nearly reaching 365 days by mid-century. Days with temperatures exceeding 30°C are expected to average 309.17 annually, with a substantial increase of 11 days per decade, reaching between 329.73 and 336.97 days.

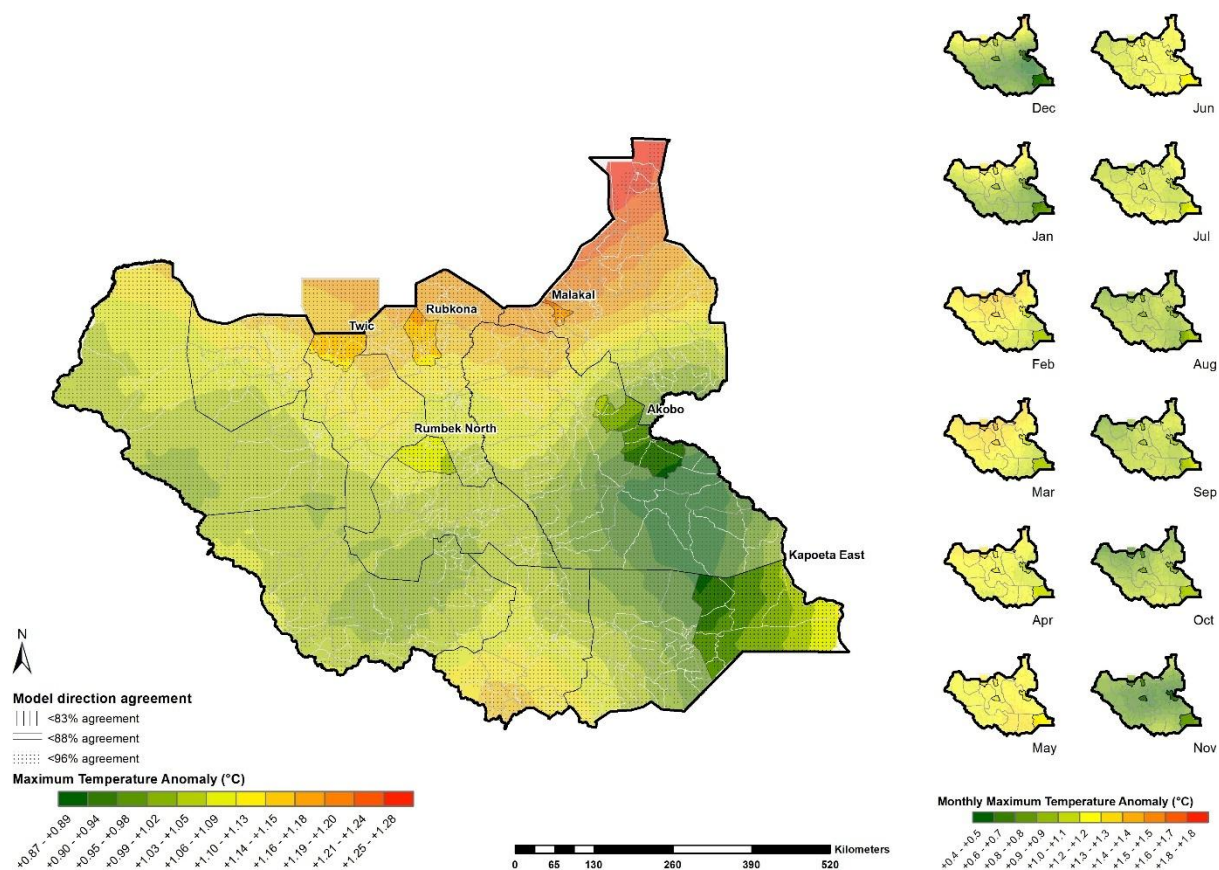
The number of extremely hot days above 35°C is projected to average 123.38 days annually, with a significant increase of 9.48 days per decade, resulting in a range of 146.58 to 153.09 days by 2050. Days with temperatures exceeding 40°C are expected to rise more sharply, averaging 15.42 days annually, with a significant increase of 3.51 days per decade, reaching between 26.12 and 28.57 days by mid-century.

The annual average anomaly map shows a clear gradient of projected warming. Northern regions, particularly around Malakal and Rubkona, exhibit the highest temperature anomalies, with values exceeding +1.25°C, shown in dark red. Central areas, such as Rumbek North, experience moderate warming, with anomalies ranging between +1.0°C and +1.13°C, shown in yellow to orange shades. In contrast, southeastern regions, particularly around Kapoeta East, show smaller anomalies, with values below +1.0°C, indicated in green shades.

The monthly anomaly maps demonstrate how these temperature changes vary over the year. During the dry season months, such as December, January, and February, the northern regions consistently experience the highest anomalies, shown in orange to red shades, while southeastern regions show the smallest changes.

As the year progresses into the wet season, from March to August, the spatial pattern remains consistent. Northern areas, including Rubkona and Malakal, continue to show higher anomalies, while southeastern regions, such as Kapoeta East, exhibit the smallest temperature increases. The anomalies during the wet season months are slightly lower compared to the dry season, with central areas showing moderate warming.

In the transitional months of October and November, the warming trend intensifies again in northern regions, with anomalies returning to values exceeding +1.25°C, shown in dark red. Southeastern regions remain the least affected, with anomalies consistently below +1.0°C.



*Figure 0-12: Projected Temperature distribution anomaly. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)*

The annual peak monthly temperature anomaly highlights a general warming trend across South Sudan. Southeastern regions, particularly around Kapoeta East, show the lowest peak monthly anomalies, with values not exceeding +1.0°C. Central areas, such as Rumbek North and Akobo, experience moderate increases, ranging up to +1.3°C. Northern regions, including Rubkona and Twic, exhibit the largest anomalies, generally between +1.3°C and +1.5°C.

The warm spell duration anomaly shows that southeastern regions, especially Kapoeta East, are projected to experience the most significant increases in warm spell durations, with anomalies exceeding +47.7 to +55.6 days, shown in dark red. Central regions, such as Rumbek North, exhibit moderate increases in warm spell durations, ranging between +34.2 and +40.9 days. Northern regions, including Rubkona and Twic, show smaller increases, generally less than +26.3 days, indicated in yellow.

The hot days anomaly map reveals that southeastern areas are expected to see the largest increases in the number of days exceeding 35°C, with anomalies exceeding +33.6 to +53.5 days. Central regions experience moderate increases, ranging between +24.8 and +33.5 days, shown in orange. Northern areas, including Rubkona and Twic, exhibit smaller increases, generally below +12.8 days.

The hottest single-day temperature anomaly map shows that northwestern regions will experience the most significant increases in single-day maximum temperatures, with anomalies exceeding +1.3°C. Central regions experience more moderate increases, ranging up to +1.0°C.

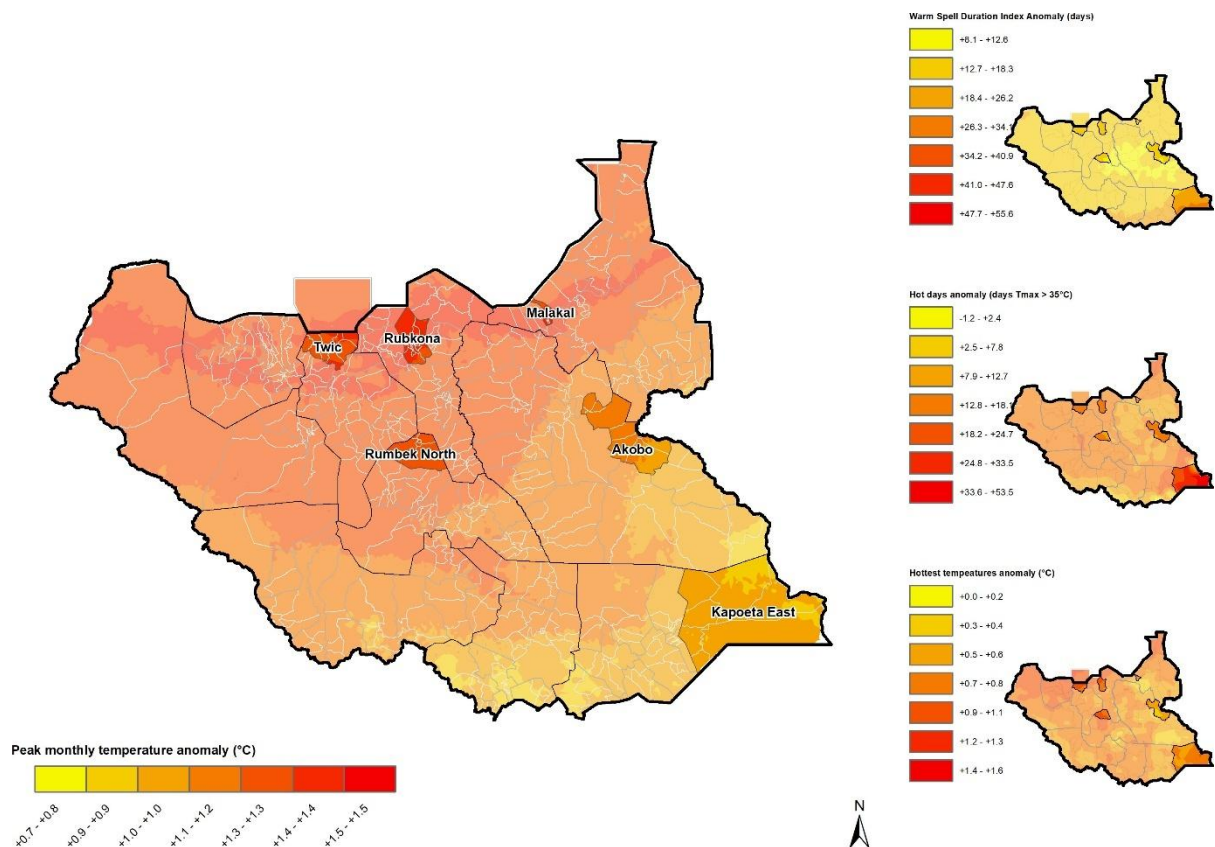
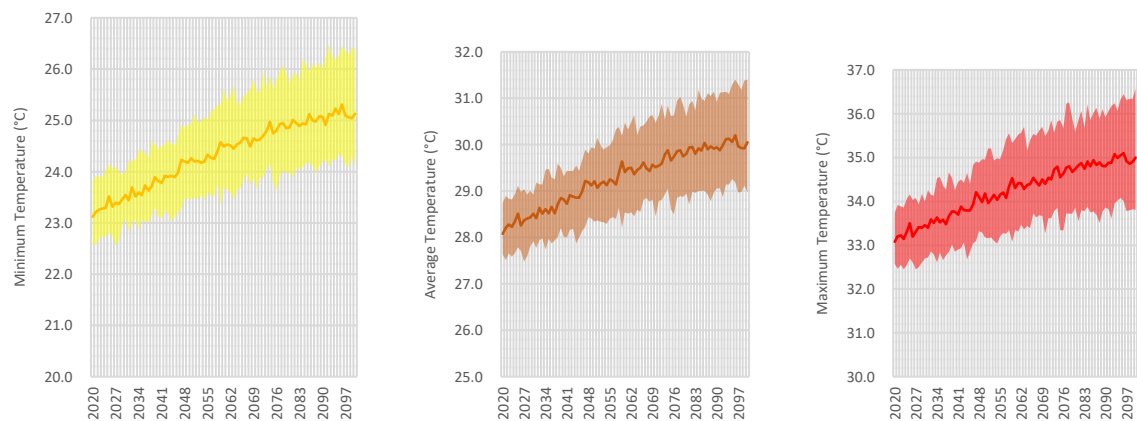


Figure 0-13: Projected heatwave and extreme temperature characteristics. Peak monthly temperatures (left), extreme temperature characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)



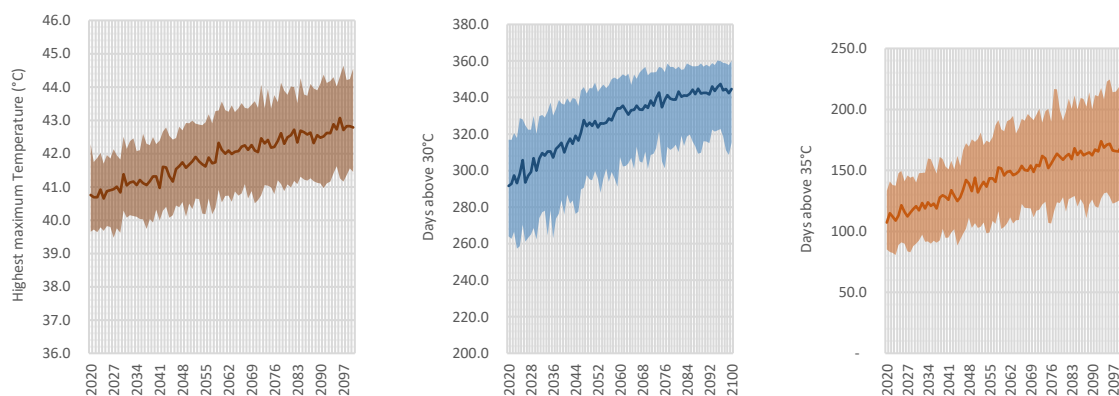


Figure 0-14. Longitudinal change in temperatures from 2020-2100 (SSP2-45). Minimum (top left), Mean (top centre), Maximum (top right) temperatures, Peak maximum temperature (bottom right), days above 30 °C (bottom middle), and the days above 35 °C (bottom left)

Table 0-4. Projected change in temperatures from 2020-2050

|                           | Minimum Temp    | Mean Temp      | Maximum Temp    | Lowest Minimum Temp | Highest maximum Temp | Days above 25°C      | Days above 30°C      | Days above 35°C      | Days above 40°C    |
|---------------------------|-----------------|----------------|-----------------|---------------------|----------------------|----------------------|----------------------|----------------------|--------------------|
| Mean 2020-2050            | 23.7            | 28.6           | 33.6            | 18.8                | 41.2                 | 364.7                | 309.2                | 123.4                | 15.4               |
| 95% confidence interval   | 24.45 - 24.67°C | 29.38 - 29.6°C | 34.31 - 34.52°C | 19.58 - 19.79°C     | 41.98 - 42.19°C      | 364.87 - 364.93 days | 329.73 - 336.97 days | 146.58 - 153.09 days | 26.12 - 28.57 days |
| Statistical Trend         | Significant     | Significant    | Significant     | Significant         | Significant          | Significant          | Significant          | Significant          | Significant        |
| Trend (change per decade) | 0.34°C          | 0.33°C         | 0.32°C          | 0.26°C              | 0.3°C                | 0.09 days            | 11 days              | 9.48 days            | 3.51 days          |

### Focus area climate changes

The following presents the detailed climate changes in each of the focus areas.

**Rainfall Patterns:** Eastern Equatoria shows the highest rate of increase in annual rainfall (1.5% per decade), whereas Lakes and Warrap exhibit more moderate increases (0.42% and 0.54% per decade, respectively). Unity and Upper Nile have similar trends (0.53% and 0.46% per decade). Interestingly, the number of days with heavy rainfall (above 20mm) shows statistically significant increases in all states, though Warrap records the lowest baseline frequency for such days.

**Extreme Temperatures:** All states exhibit warming trends in maximum, mean, and minimum temperatures. Unity and Warrap show some of the highest increases in hot days above 35°C and extremely hot days above 40°C. Unity, for example, is projected to have 40.24 days above 40°C by 2050, while Eastern Equatoria experiences the least extreme warming in terms of peak daily temperatures.

**Drought Index and Dry Spells:** While the drought index (SPEI) shows potential reductions in drought severity across all states, Eastern Equatoria and Unity display greater reductions in consecutive dry days compared to Lakes and Warrap, which have marginal declines. Interestingly, Unity and Upper Nile exhibit non-significant changes in consecutive wet days, contrasting with Eastern Equatoria's significant increases.

-Relative Humidity: A statistically significant decrease in relative humidity is noted across most states, with Unity showing one of the steepest declines. This decrease could exacerbate water loss through evaporation, impacting both ecosystems and water infrastructure.

### **Impacts on School-Age Children and Infrastructure**

- **Heat Stress:** Rising temperatures, particularly the increasing frequency of extremely hot days and tropical nights, can lead to heat-related illnesses in children. Prolonged exposure to high temperatures, especially during school hours, could impact cognitive performance and physical well-being.
- **Waterborne Diseases:** Increased rainfall and peak precipitation in states like Eastern Equatoria and Upper Nile may lead to flooding and stagnant water, providing breeding grounds for disease vectors like mosquitoes. This could increase malaria and waterborne disease risks among children.
- **Nutrition:** Changing rainfall patterns and increasing heat stress may disrupt agricultural systems, potentially affecting food availability. Malnutrition could become a more pressing issue for children in affected areas.
- **School Facilities:** Increased rainfall intensity and extreme rainfall events pose risks to school buildings, particularly in states like Upper Nile and Warrap, where peak monthly rainfall is significantly increasing. Poorly built schools may face structural damage or collapse during floods.
- **Road Access:** Flooding in states like Jonglei and Unity, with increasing 5-day peak rainfall magnitudes, could make roads impassable, disrupting children's access to schools and other essential services.
- **Energy Demands:** The rise in tropical nights across all states, combined with longer warm spells, will likely increase demand for cooling infrastructure in schools. Many rural schools, however, may lack access to reliable electricity.

### *Eastern Equatoria*

The future climate projections for Eastern Equatoria State indicate significant changes in rainfall patterns, characterized by both increases in annual totals and intensification of extreme rainfall events. Mean annual rainfall is projected to increase at a statistically significant rate of 1.5% per decade, equating to an additional 16.52 mm per decade. From an average value of 1,103 mm annually (2015–2035), rainfall is expected to reach approximately 1,116 mm annually by 2020–2050. The 95% confidence range for annual rainfall is between 1,079.4 mm and 1,126.41 mm, indicating consistent upward trends in precipitation.

The frequency of heavy rainfall events is also projected to increase. Days with rainfall exceeding 20 mm are expected to rise significantly, with a trend of 0.08 days per decade. From an average of 0.86 days annually, this number is anticipated to range between 0.7 and 1.02 days annually by mid-century. While days with rainfall exceeding 50 mm are rare and show no projected increase, other measures of rainfall intensity reveal significant upward trends.

Single-day peak rainfall magnitudes are projected to increase at a statistically significant rate of 0.33 mm per decade, from an average of 21.45 mm to a range of 20.78–22.12 mm. Similarly, the five-day peak rainfall magnitude is expected to rise by 0.84 mm per decade, from an average of 54.42 mm to a range of 52.96–55.88 mm, reflecting the potential for more prolonged and intense rainfall periods.

Monthly cumulative rainfall during the wettest periods is projected to increase significantly, with peak monthly totals rising by 1.57 mm per decade. From an average of 131.93 mm (2015–2035), peak monthly rainfall is expected to range between 128.58 mm and 135.27 mm by mid-century, highlighting an intensification of the wettest months in Eastern Equatoria.

These changes in rainfall and extreme precipitation events have critical implications for Eastern Equatoria State. The increase in annual rainfall and extreme rainfall events could support agricultural productivity and water availability, providing opportunities for improved livelihoods in rain-fed agricultural systems. However, the intensification of peak rainfall events raises concerns about flooding, soil erosion, and potential damage to infrastructure. Proactive measures, such as improved water management, flood control systems, and sustainable agricultural practices, will be essential to mitigate risks and harness the benefits of these projected changes.

The future climate projections for Eastern Equatoria State indicate changes in drought conditions, dry and wet spell durations, and atmospheric moisture levels, reflecting a shifting balance in water availability. The Standardized Precipitation-Evapotranspiration Index (SPEI), a key indicator of drought, shows a projected increase of 0.07 per decade, with an average value of -0.02 (2015–2035). While this trend is not statistically significant, it suggests the potential for fewer severe droughts in the future. The 95% confidence range for SPEI is between -0.1 and 0.05, indicating variability in drought severity across the region.

Consecutive dry days are projected to decrease significantly, with a trend of -0.37 days per decade. From an average of 30.2 days annually (2015–2035), the number of dry days is expected to range between 29.23 and 31.17 days by mid-century. This statistically significant decline points to shorter dry periods, which could benefit agricultural and water availability in the region.

Conversely, consecutive wet days are expected to increase significantly, with a trend of 0.12 days per decade. From an average of 17.15 days annually, wet spells are projected to range between 16.7 and 17.61 days, indicating a gradual increase in prolonged rainy periods. This shift could enhance water resources and support rain-fed agriculture in the region.

Relative humidity is projected to see a slight increase of 0.02% per decade, with an average value of 49.27% (2015–2035). By 2020–2050, relative humidity is expected to reach 49.42%, with a 95% confidence range of 48.9% to 49.64%. Although this trend is not statistically significant, it reflects minor changes in atmospheric moisture content.

Eastern Equatoria State is projected to experience shorter dry spells, slightly longer wet spells, and modest increases in atmospheric moisture. These changes suggest improved conditions for agriculture and water availability, although variability in drought severity remains a concern. Adaptation strategies, including sustainable water management and drought-resistant agricultural practices, will be essential to harness the benefits of these changes while mitigating potential risks.

The projected future climate for Eastern Equatoria State indicates a significant warming trend across all temperature metrics, highlighting the need for adaptation to rising temperatures. The mean maximum temperature is projected to increase at a statistically significant rate of 0.1416°C per decade, with an average value of 23°C (2015–2035). By 2020–2050, maximum temperatures are expected to remain at 23°C, with a 95% confidence range of 22.98–23.1°C, reflecting consistent warming during daytime hours.

Mean temperatures are also projected to rise significantly, increasing at a rate of 0.15°C per decade. From an average of 19.87°C, mean temperatures are expected to reach 20.05°C by mid-century, with



a 95% confidence range of 19.82–19.93°C. This upward trend reflects a general warming of the region's overall climate.

Minimum temperatures show a similar statistically significant increase, with a projected trend of 0.15°C per decade. From an average of 16.73°C, minimum temperatures are anticipated to rise to 16.92°C by 2050, with a 95% confidence range of 16.67–16.79°C. This steady increase in nighttime temperatures suggests that cooler periods will become less pronounced.

These warming trends will have wide-ranging implications for Eastern Equatoria State. Higher maximum temperatures could exacerbate heat stress for both humans and livestock, reduce crop yields, and increase evapotranspiration, intensifying water stress in the region. Rising minimum and mean temperatures may affect the comfort of residents, particularly vulnerable populations, and could disrupt traditional cooling periods during the night.

The future climate for Eastern Equatoria State shows significant changes in extreme temperature parameters, with warming trends across multiple metrics indicating prolonged and more intense heat conditions. Warm spell durations are projected to increase substantially, with a statistically significant trend of 14.45 days per decade. From an average of 24.52 days annually (2015–2035), warm spells are expected to extend to 38.67 days by 2020–2050, with a 95% confidence range of 21.15–27.89 days. This highlights a growing prevalence of sustained high-temperature periods.

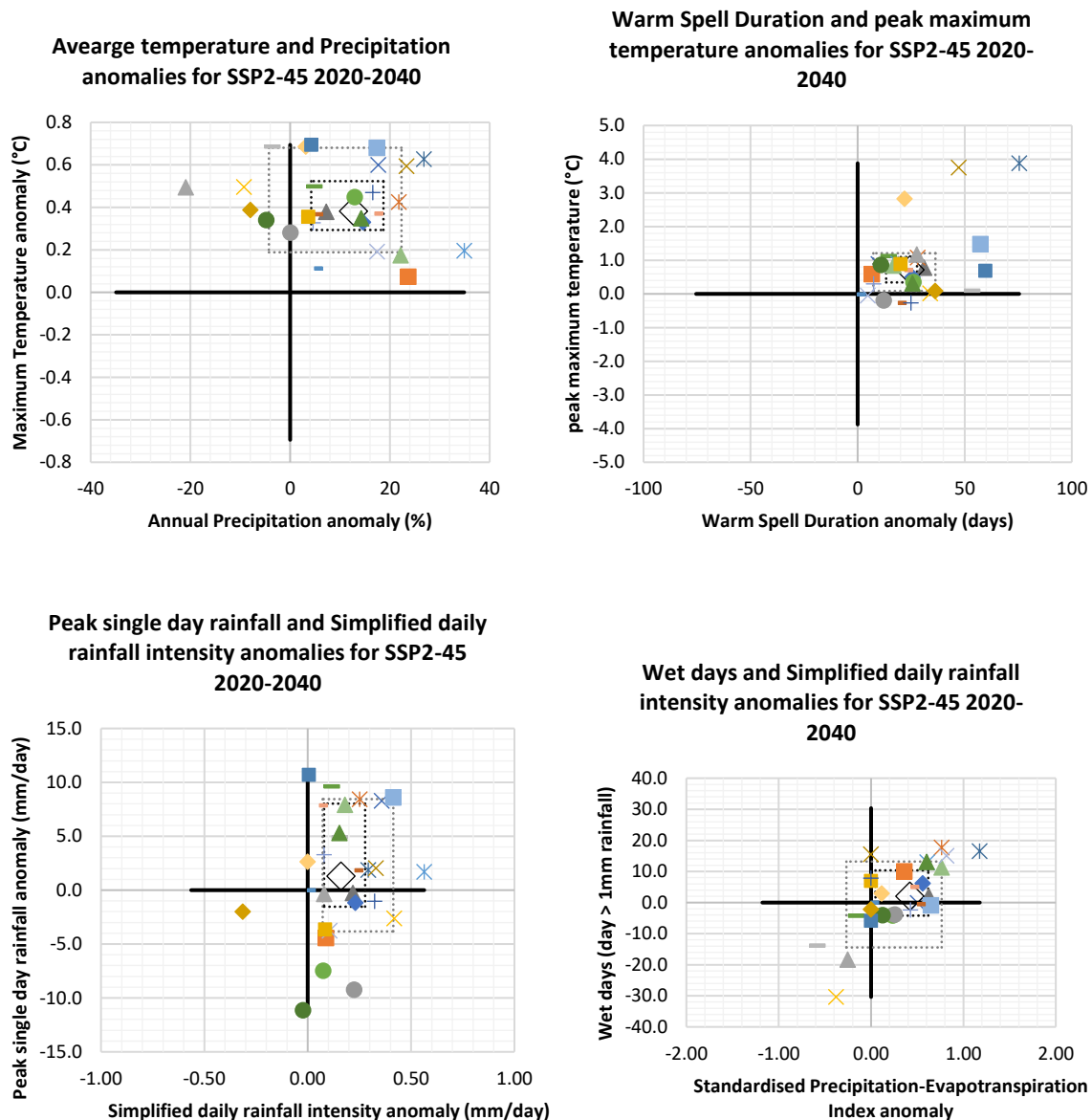
Days with temperatures exceeding 25°C are projected to persist throughout the year, averaging 365 days annually, with no anticipated change by 2050. However, more intense heat days are expected to increase. Days above 35°C, or "hot days," are projected to rise significantly at a rate of 10.86 days per decade. From an average of 185.9 days annually, this number is expected to reach 198.44 days by mid-century, with a 95% confidence range of 180.95–190.84 days. Similarly, extremely hot days exceeding 40°C are projected to increase by 3.71 days per decade, rising from an average of 2.86 days annually to 5.14 days by 2050. The 95% confidence range for extremely hot days is 2.3–3.42 days, underscoring a shift toward more frequent and extreme heat events.

Peak single-day maximum temperatures are also projected to rise significantly, with an increase of 0.24°C per decade. From an average of 40.21°C (2015–2035), peak temperatures are expected to reach 40.45°C by 2050, with a 95% confidence range of 40.14–40.29°C. These projected increases in daily maximum temperatures emphasize the growing intensity of heat extremes.

Nighttime temperatures are expected to remain consistently high, with tropical nights (temperatures above 20°C) averaging 364.99 nights annually. While there is no significant projected trend, this consistency suggests minimal cooling relief during nighttime hours. Additionally, the lowest daily minimum temperatures are projected to increase by 0.19°C per decade, rising from an average of 21.41°C to 21.69°C by mid-century. This trend reflects a reduction in the cooler extremes, further amplifying the warming climate.

These projected changes in extreme temperature conditions have critical implications for Eastern Equatoria State. Prolonged warm spells and frequent extreme heat days could significantly impact agricultural productivity, water availability, and public health. High nighttime temperatures may reduce recovery periods from daytime heat stress, particularly for vulnerable populations. Adaptation strategies, including heat-resilient infrastructure, improved water resource management, and community health programs, will be essential to address these challenges and ensure resilience to the increasing temperatures in the region.





*Figure 0-15. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

### Jonglei

The projected future climate for Jonglei State indicates significant changes in rainfall patterns and extreme rainfall events, with notable increases in overall precipitation and intensity. Mean annual rainfall is projected to increase at a statistically significant rate of 0.72% per decade, equivalent to 8.44 mm per decade. The average annual rainfall from 2015–2035 is 1,177 mm, with a 95% confidence range of 1,159.5–1,195.26 mm per year. By 2020–2050, rainfall is projected to reach approximately 1,194 mm annually, reflecting a gradual but consistent increase in water availability across the region.

Extreme rainfall events are also expected to become more pronounced. The number of days with rainfall exceeding 20 mm is projected to increase significantly, with a trend of 0.11 additional days per decade. The average is 1.85 days annually, with a 95% confidence range of 1.69–2.01 days. While days

with rainfall above 50 mm are rare and show no projected increase, other indicators of rainfall intensity reveal upward trends.

Single-day peak rainfall magnitudes are projected to increase significantly, with an average value of 24.85 mm and a trend of 0.33 mm per decade. The 95% confidence range for single-day peaks is 24.18–25.53 mm, highlighting the potential for short but intense rainfall events. Similarly, the five-day peak rainfall magnitude is expected to rise by 0.78 mm per decade, with an average of 66.79 mm and a range of 65.64–67.94 mm, suggesting an increased likelihood of prolonged heavy rainfall periods.

Monthly cumulative rainfall is projected to see significant increases as well, with the largest monthly precipitation totals averaging 224.88 mm and increasing by 1.73 mm per decade. The 95% confidence range for these peak monthly values is 221.83–227.93 mm, reflecting more intense wet seasons.

These changes in rainfall and extreme precipitation events present both opportunities and challenges for Jonglei State. Increased rainfall could improve water availability for agriculture and ecosystems, supporting livelihoods dependent on natural resources. However, the rise in intense rainfall events raises concerns about flooding, soil erosion, and potential damage to infrastructure. Proactive measures, such as flood management systems, resilient infrastructure, and sustainable land-use practices, will be crucial to mitigating risks and capitalizing on the benefits of increased precipitation in the region.

The projected climate for Jonglei State shows notable changes in drought conditions, dry and wet spells, and moisture levels, with potential implications for water resources, agriculture, and ecosystems. The Standardized Precipitation-Evapotranspiration Index (SPEI), a key drought indicator, is projected to increase at a rate of 0.06 per decade, with an average value of 0.04. While this increase is not statistically significant, it suggests a potential for fewer severe drought events in the future. The 95% confidence range for SPEI is -0.03 to 0.11, indicating some variability in drought severity.

Consecutive dry days are projected to decrease significantly by 0.56 days per decade, with an average of 56.42 days annually. This statistically significant trend points to shorter dry periods, with a 95% confidence range of 55.06 to 57.77 days. Conversely, consecutive wet days are projected to increase slightly by 0.14 days per decade, averaging 42.02 days annually. However, this increase is not statistically significant, with a 95% confidence range of 40.35 to 43.69 days. These shifts suggest a more balanced distribution between dry and wet periods, which could benefit agricultural activities and water availability.

Relative humidity is projected to decrease significantly by -0.16% per decade, with an average value of 59.67% and a future projection of 59.75% for 2020–2050. This statistically significant trend, with a confidence range of 59.4% to 59.94%, indicates a gradual drying of the atmosphere, which may counterbalance some of the benefits of reduced drought severity and shorter dry spells. Lower humidity levels could increase evapotranspiration rates, potentially affecting soil moisture and crop water requirements.

Jonglei State is projected to experience a reduction in consecutive dry days and a slight increase in consecutive wet days, suggesting improved conditions for water availability. However, the significant decrease in relative humidity underscores the need for careful management of water resources and agricultural practices to adapt to potentially drier atmospheric conditions. Investments in water storage, soil conservation, and crop diversification will be critical to mitigating risks and ensuring resilience to these projected changes.

The projected future climate for Jonglei State indicates a significant warming trend across all temperature metrics, with potential implications for agriculture, water resources, and public health. Maximum temperatures are projected to increase at a statistically significant rate of 0.2414°C per decade, with an average value of 34°C from 2015 to 2035. The 95% confidence range for maximum temperatures is 33.6°C to 33.77°C, and this warming trend is expected to continue, with maximum temperatures remaining at 34°C through 2020–2050.

Mean temperatures are projected to rise at a statistically significant rate of 0.25°C per decade, increasing from an average of 29.02°C to 29.31°C by mid-century. The 95% confidence range for mean temperatures is 28.94°C to 29.11°C, indicating consistent warming across the region.

Minimum temperatures are expected to see the most pronounced increase, with a projected statistically significant trend of 0.26°C per decade. From an average of 24.36°C during 2015–2035, minimum temperatures are anticipated to reach 24.66°C by 2050. The 95% confidence range for minimum temperatures is 24.29°C to 24.44°C, reflecting steadily rising nighttime temperatures.

These warming trends highlight a changing thermal regime for Jonglei State, with hotter days, warmer nights, and higher baseline temperatures overall. Elevated maximum temperatures could exacerbate heat stress for humans and livestock, reduce agricultural yields, and increase water demand. Rising minimum temperatures may disrupt cooling periods at night, impacting human health, particularly for vulnerable populations such as children and the elderly. Warmer average temperatures could also affect the region's ecosystems, altering plant and animal behaviours and potentially reducing biodiversity.

The projected temperature increases in Jonglei State underscore the need for climate adaptation measures. Strategies such as improving heat-resilient infrastructure, adopting heat-tolerant crops, and enhancing access to water resources will be essential to mitigating the impacts of these changes and ensuring the resilience of communities and livelihoods in the face of a warming climate.

The projected climate for Jonglei State indicates significant increases in extreme temperature parameters, with notable impacts on heat events, warm spells, and daily temperature extremes. Warm spell durations are projected to increase significantly, with a trend of 11.58 days per decade. This represents a rise from an average of 18.41 days (2015–2035) to 28.05 days by 2020–2050. The 95% confidence range for warm spells is 15.24–21.58 days, emphasizing a substantial increase in prolonged heat periods.

The number of days exceeding 25°C is expected to remain constant at 365 days annually, reflecting near-constant summer-like conditions throughout the year. While this trend is not statistically significant, it underscores the consistently high baseline temperatures in the region. However, more intense heat days are projected to increase significantly. The number of days above 35°C is expected to rise by 6.85 days per decade, from an average of 132.46 days to 140.69 days annually by 2050. Similarly, extremely hot days exceeding 40°C are projected to increase sharply by 4.78 days per decade, rising from an average of 17.13 days to 21.18 days annually. These trends reflect a significant intensification of heat extremes, with the 95% confidence ranges for days above 35°C and 40°C being 129.98–134.93 days and 15.55–18.71 days, respectively.

Peak single-day maximum temperatures are also expected to rise significantly, with a trend of 0.28°C per decade. The average peak temperature of 41.68°C (2015–2035) is projected to reach 41.96°C by 2050, with a 95% confidence range of 41.6–41.76°C. This increase in daily temperature extremes highlights the growing intensity of heatwaves in the region.

Nighttime temperatures are also projected to rise, with the number of nights exceeding 20°C (tropical nights) increasing slightly by 0.11 nights per decade. From an average of 364.25 nights (2015–2035), this number is projected to reach 364.58 nights annually by 2050, indicating virtually no cooling relief at night. The lowest daily minimum temperatures are expected to increase by 0.22°C per decade, rising from an average of 20.09°C to 20.34°C by mid-century, further diminishing the cooler periods of the year.

These increases in extreme temperatures will exacerbate heat stress for both humans and ecosystems. Longer warm spells and more frequent extremely hot days above 35°C and 40°C will challenge agricultural productivity, water availability, and public health. Elevated nighttime temperatures may disrupt sleep patterns and reduce recovery from daytime heat, particularly for vulnerable populations such as children, the elderly, and outdoor workers.

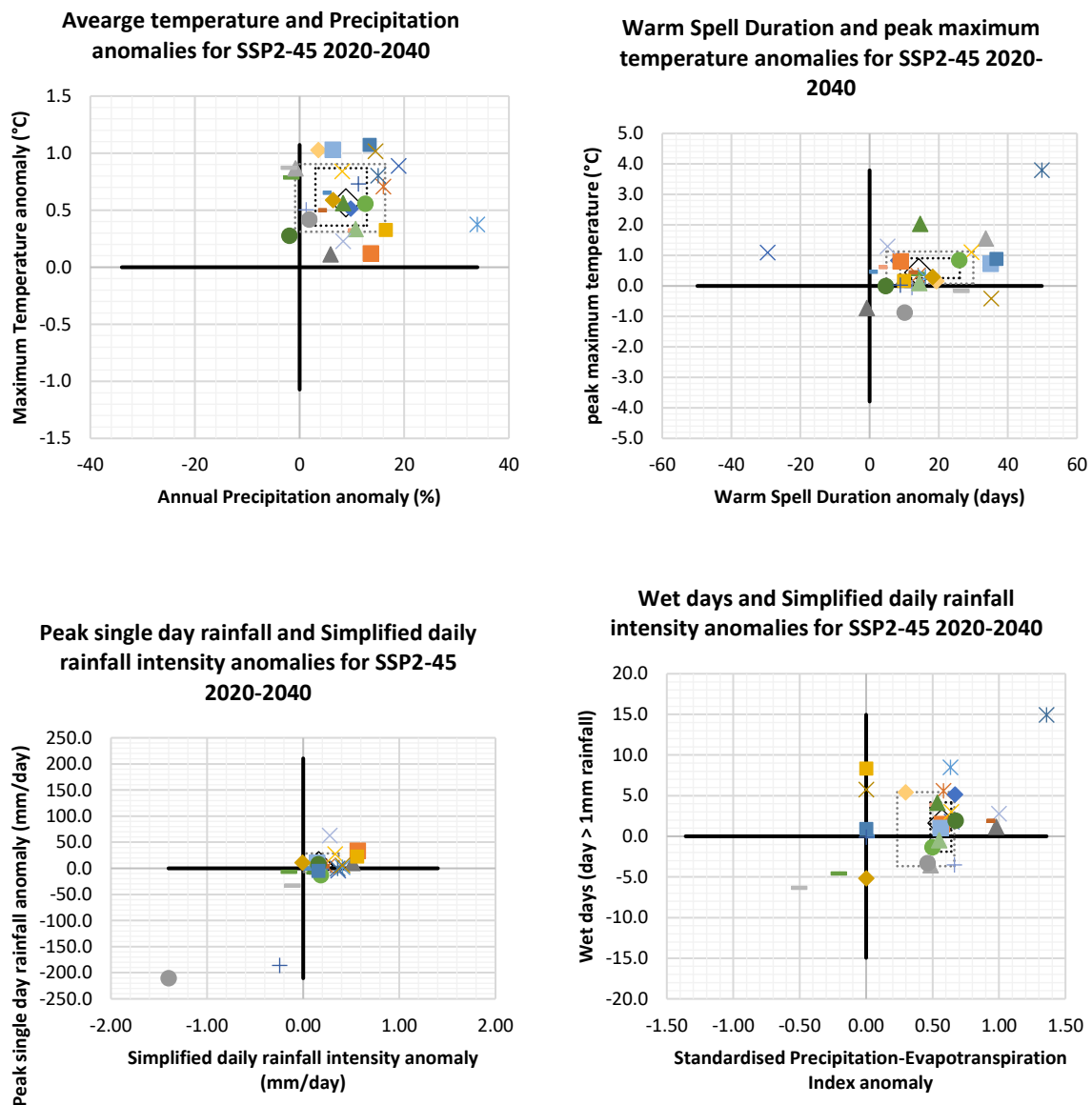


Figure 0-16. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

## Lakes

The projected future climate for Lakes State indicates changes in rainfall patterns, with both increases in annual precipitation and intensification of extreme rainfall events. Mean annual rainfall is projected to increase at a statistically significant rate of 0.42% per decade, equivalent to 5.14 mm per decade. From an average value of 1,220 mm annually (2015–2035), rainfall is expected to rise to 1,229 mm annually by 2020–2050. The 95% confidence range for annual rainfall is between 1,205.09 mm and 1,233.96 mm, highlighting a consistent upward trend in precipitation.

The frequency of heavy rainfall events is also expected to increase. Days with rainfall exceeding 20 mm are projected to rise at a statistically significant rate of 0.03 days per decade. From an average of 1.05 days annually, this number is anticipated to range between 0.9 and 1.21 days annually by mid-century. While days with rainfall exceeding 50 mm remain rare, other measures of rainfall intensity show significant increases.

Single-day peak rainfall magnitudes are projected to increase at a statistically significant rate of 0.28 mm per decade, from an average of 21.75 mm to a range of 21.17–22.33 mm. Similarly, the five-day peak rainfall magnitude is expected to rise by 0.62 mm per decade, from an average of 60.98 mm to a range of 60.09–61.87 mm, reflecting the potential for more prolonged heavy rainfall periods.

Monthly cumulative rainfall during the wettest periods is projected to increase slightly, with peak monthly totals rising by 0.53 mm per decade. From an average of 223.81 mm (2015–2035), peak monthly rainfall is expected to range between 221.22 mm and 226.4 mm by mid-century. Although this trend is not statistically significant, it indicates a steady intensification of the region's wettest months.

These projected changes in rainfall and extreme precipitation events have important implications for Lakes State. Increased annual rainfall and more frequent intense rainfall events could support agricultural productivity and water availability, essential for livelihoods dependent on rain-fed farming. However, the intensification of peak rainfall events raises concerns about flooding, soil erosion, and potential damage to infrastructure. Effective water management strategies, flood control systems, and climate-resilient infrastructure will be critical to mitigate risks and leverage the benefits of increased rainfall in the region.

The projected future climate for Lakes State suggests notable changes in drought conditions, dry spells, and atmospheric moisture levels, reflecting a shifting balance in water availability and climate patterns. The Standardized Precipitation-Evapotranspiration Index (SPEI), a key measure of drought, shows a statistically significant increase of 0.04 per decade. With an average value of 0.11 (2015–2035) and a 95% confidence range of 0.02–0.19, this trend indicates fewer severe droughts in the future, suggesting improved baseline conditions for water availability and agricultural productivity.

Consecutive dry days are projected to decrease significantly at a rate of -0.53 days per decade. From an average of 51.43 days annually, the number of dry days is expected to range between 49.69 and 53.16 days by mid-century. This statistically significant decline suggests shorter dry periods, which could enhance water availability and reduce stress on rain-fed agricultural systems.

Conversely, consecutive wet days show a slight decrease, with a projected trend of -0.15 days per decade. From an average of 55.8 days annually, wet spells are expected to range between 53.15 and 58.46 days. However, this trend is not statistically significant, indicating variability in the occurrence of prolonged rainy periods.

Relative humidity is projected to decrease significantly, with a trend of -0.13% per decade. From an average of 59.44% (2015–2035), humidity levels are expected to decline slightly to 59.41% by 2020–2050. The 95% confidence range for relative humidity is 59.27–59.61%, reflecting a drying trend in the atmosphere, which could counterbalance some of the benefits of reduced drought severity and shorter dry spells.

Lakes State is projected to experience fewer severe droughts and shorter dry spells, suggesting improved conditions for water availability and agricultural production. However, the decrease in relative humidity and the slight decline in consecutive wet days highlight potential challenges related to atmospheric drying and variability in rainy periods. To adapt to these changes, investments in water management infrastructure, sustainable agricultural practices, and community-level climate resilience strategies will be crucial. These measures will help ensure that the benefits of reduced drought severity are maximized while mitigating the risks posed by atmospheric drying.

The projected future climate for Lakes State indicates significant warming across all temperature metrics, emphasizing the growing impact of climate change on the region. The mean maximum temperature is projected to increase at a statistically significant rate of 0.2569°C per decade. With an average value of 34°C (2015–2035) and a 95% confidence range of 33.62–33.78°C, maximum temperatures are expected to remain at 34°C by 2020–2050, highlighting the persistence of high daytime heat levels.

Mean temperatures are also projected to rise significantly, with an increase of 0.26°C per decade. From an average of 28.8°C (2015–2035), mean temperatures are anticipated to reach 29.15°C by mid-century, with a 95% confidence range of 28.72–28.88°C. This steady increase reflects a warming baseline for the region's overall climate.

Minimum temperatures show the most pronounced increase, with a projected statistically significant trend of 0.27°C per decade. From an average of 23.87°C (2015–2035), minimum temperatures are expected to rise to 24.22°C by 2050, with a 95% confidence range of 23.78–23.95°C. This trend indicates warmer nights, which may reduce the cooling relief typically experienced during nighttime hours.

These projected temperature increases will have broad implications for Lakes State. Rising maximum temperatures could exacerbate heat stress for humans and livestock, reduce crop yields, and increase water demands for agriculture and domestic use. Higher minimum temperatures may disrupt recovery periods during the night, particularly for vulnerable populations such as children and the elderly. Meanwhile, the overall increase in mean temperatures reflects a warming trend that could influence ecosystems, water resources, and infrastructure resilience.

The projected future climate for Lakes State indicates significant increases in extreme temperature parameters, emphasizing the intensification of heat events and prolonged warm periods. Warm spell durations are expected to increase significantly, with a trend of 13.97 days per decade. From an average of 17.67 days annually (2015–2035), warm spells are projected to extend to 28.88 days by 2020–2050, with a 95% confidence range of 15.07–20.26 days. This trend underscores a growing prevalence of sustained heat periods.

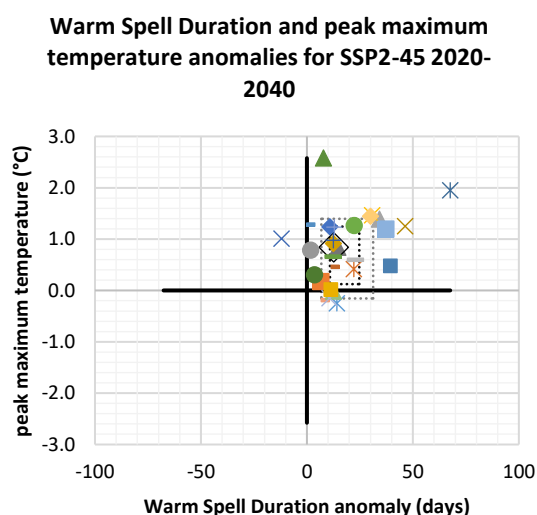
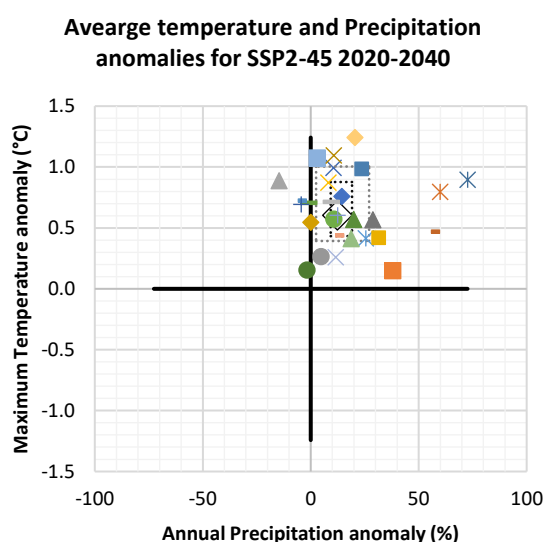
Days with temperatures above 25°C are projected to persist throughout the year, averaging 365 days annually, with no change anticipated by 2050. However, more extreme heat days are expected to become more frequent. Days above 35°C, or "hot days," are projected to increase significantly, with a trend of 8.06 days per decade. From an average of 126.87 days annually, this figure is expected to reach 136.72 days by mid-century, with a 95% confidence range of 123.95–129.8 days. Similarly,

extremely hot days above 40°C are projected to increase sharply by 4.7 days per decade, rising from an average of 13.97 days annually to 18.02 days by 2050. The 95% confidence range for extremely hot days is 12.91–15.03 days, reflecting a notable rise in the frequency of extreme heat events.

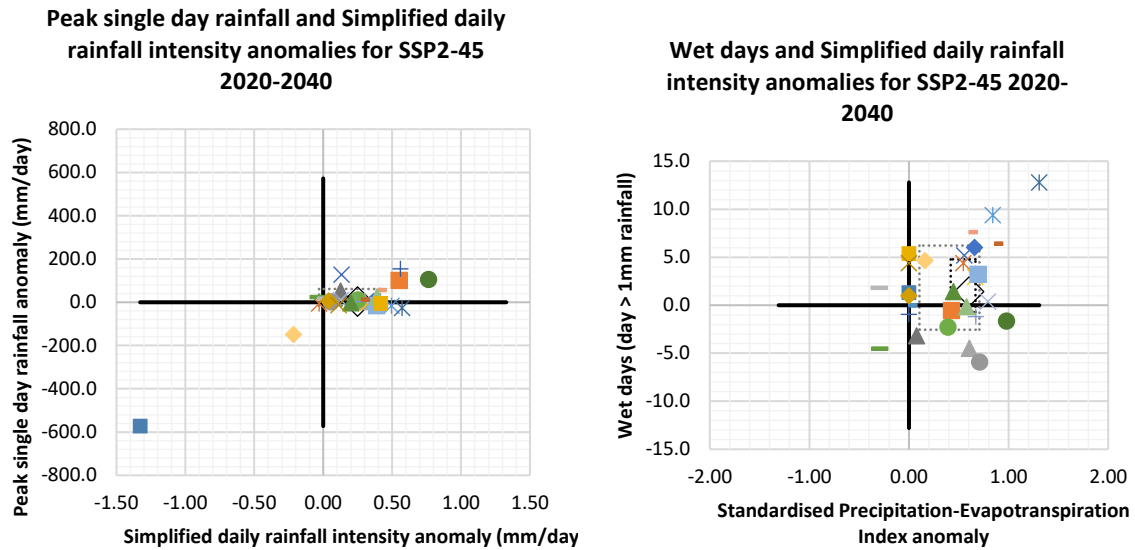
Peak single-day maximum temperatures are also projected to rise significantly, with an increase of 0.28°C per decade. From an average of 41.79°C (2015–2035), peak daily temperatures are expected to reach 42.06°C by 2050, with a 95% confidence range of 41.69–41.89°C. This highlights the increasing intensity of heatwaves and extreme heat days.

Nighttime temperatures are also projected to rise, with tropical nights (temperatures above 20°C) increasing significantly by 0.64 nights per decade. From an average of 360.64 nights annually, this figure is expected to reach 361.85 nights by 2050, with a 95% confidence range of 360.12–361.17 nights. The lowest daily minimum temperatures are expected to increase by 0.25°C per decade, from an average of 19.03°C (2015–2035) to 19.32°C by mid-century, further reducing the occurrence of cooler nights.

These increases in extreme temperature events will have significant implications for Lakes State. Longer warm spells and more frequent days above 35°C and 40°C will exacerbate heat stress for both humans and livestock, reduce agricultural productivity, and increase water demand. Rising nighttime temperatures will reduce the opportunity for cooling relief, particularly affecting vulnerable populations.







*Figure 0-17. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

### Unity

The projected future climate for Unity State indicates a significant increase in rainfall and intensification of extreme rainfall events, pointing to a wetter climate with potential impacts on agriculture, water resources, and infrastructure. Mean annual rainfall is projected to increase at a statistically significant rate of 0.53% per decade, equivalent to 5.75 mm per decade. From an average value of 1,079 mm annually (2015–2035), rainfall is expected to rise to 1,093 mm annually by 2020–2050. The 95% confidence range for annual rainfall is 1,067.64–1,090.84 mm, reflecting a consistent upward trend in precipitation.

The frequency of heavy rainfall events is also expected to increase. Days with rainfall exceeding 20 mm are projected to rise at a statistically significant rate of 0.07 days per decade. From an average of 1.07 days annually, this figure is anticipated to range between 0.96 and 1.19 days annually by mid-century. However, days with rainfall exceeding 50 mm remain rare, with no projected increase.

Other indicators of rainfall intensity show upward trends. Single-day peak rainfall magnitudes are projected to increase at a statistically significant rate of 0.31 mm per decade. From an average of 21.92 mm (2015–2035), single-day peaks are expected to range between 21.5 and 22.33 mm. Similarly, the five-day peak rainfall magnitude is expected to increase by 0.59 mm per decade, rising from an average of 63.25 mm to a range of 62.53–63.97 mm, indicating more prolonged heavy rainfall periods.

Monthly cumulative rainfall during the wettest periods is projected to increase significantly, with peak monthly totals rising by 1.39 mm per decade. From an average of 230.89 mm (2015–2035), monthly peaks are expected to range between 227.59 and 234.19 mm by mid-century, reflecting an intensification of the region's wettest months.

These changes in rainfall and extreme precipitation events suggest both opportunities and challenges for Unity State. Increased annual rainfall and more frequent heavy rain events could enhance agricultural productivity and water availability, particularly in rain-fed farming systems. However, the intensification of peak rainfall events raises concerns about flooding, soil erosion, and damage to infrastructure. Proactive measures, such as improving water management systems, developing flood

control infrastructure, and promoting climate-resilient agricultural practices, will be essential to mitigate risks and maximize the benefits of these projected changes in Unity State.

The projected future climate for Unity State suggests modest changes in drought conditions, dry and wet spell durations, and atmospheric moisture levels, reflecting a nuanced balance in water availability and climatic variability. The Standardized Precipitation-Evapotranspiration Index (SPEI), a key measure of drought, shows a projected increase of 0.05 per decade, with an average value of 0.1 (2015–2035). Although this trend is not statistically significant, it suggests the potential for fewer severe droughts in the future. The 95% confidence range for SPEI is 0.02–0.18, highlighting some variability in drought severity across the region.

Consecutive dry days are projected to increase slightly by 0.02 days per decade, with an average of 81.62 days annually. This trend is not statistically significant, and the 95% confidence range for dry spells is 80.21–83.03 days, indicating stable yet slightly prolonged dry periods. Conversely, consecutive wet days are expected to increase by 0.03 days per decade, with an average of 50.13 days annually. This trend is also not statistically significant, with a 95% confidence range of 47.86–52.39 days, reflecting minor improvements in the occurrence of prolonged rainy periods.

Relative humidity, a critical factor influencing evapotranspiration and soil moisture, is projected to decrease significantly by -0.11% per decade. From an average of 54.19% (2015–2035), relative humidity is expected to decline slightly to 54.27% by 2020–2050. The 95% confidence range for relative humidity is 53.95–54.43%, indicating a drying trend in the atmosphere, which could offset some of the benefits of increased precipitation and reduced drought severity.

Unity State's future climate is characterized by slight increases in both dry and wet spell durations, with a significant decline in relative humidity. While fewer severe droughts may benefit agriculture and water availability, the atmospheric drying trend highlights the need for careful management of water resources. Sustainable agricultural practices, water conservation strategies, and infrastructure improvements will be essential to adapt to these changes and maintain resilience in the face of shifting climatic conditions.

The projected future climate for Unity State indicates significant warming trends across all temperature metrics, underscoring the intensifying impacts of climate change in the region. The mean maximum temperature is projected to increase at a statistically significant rate of 0.2543°C per decade. With an average value of 35°C (2015–2035) and a 95% confidence range of 34.44–34.63°C, maximum temperatures are expected to stabilize at 35°C by 2020–2050. This highlights persistently high daytime temperatures, which will likely contribute to increased heat stress.

Mean temperatures are also projected to rise significantly, with a trend of 0.26°C per decade. From an average of 29.23°C (2015–2035), mean temperatures are expected to reach 29.58°C by mid-century, with a 95% confidence range of 29.14–29.33°C. This steady increase reflects an overall warming of the regional climate, affecting ecosystems, agriculture, and water resources.

Minimum temperatures are expected to see the most pronounced increase, with a statistically significant trend of 0.27°C per decade. From an average of 23.91°C (2015–2035), minimum temperatures are anticipated to rise to 24.28°C by 2050, with a 95% confidence range of 23.82–24.01°C. This indicates warmer nights, reducing the cooling relief typically experienced during nighttime hours and exacerbating the impact of heat stress on communities and ecosystems.

These warming trends in Unity State have broad implications. Elevated maximum temperatures could increase evapotranspiration rates, reducing water availability for agriculture and natural ecosystems.

Higher mean temperatures may stress crops and livestock, while rising minimum temperatures could disrupt traditional cooling cycles at night, impacting human health and productivity. Vulnerable populations, including children, the elderly, and outdoor workers, are likely to face heightened risks from prolonged heat exposure.

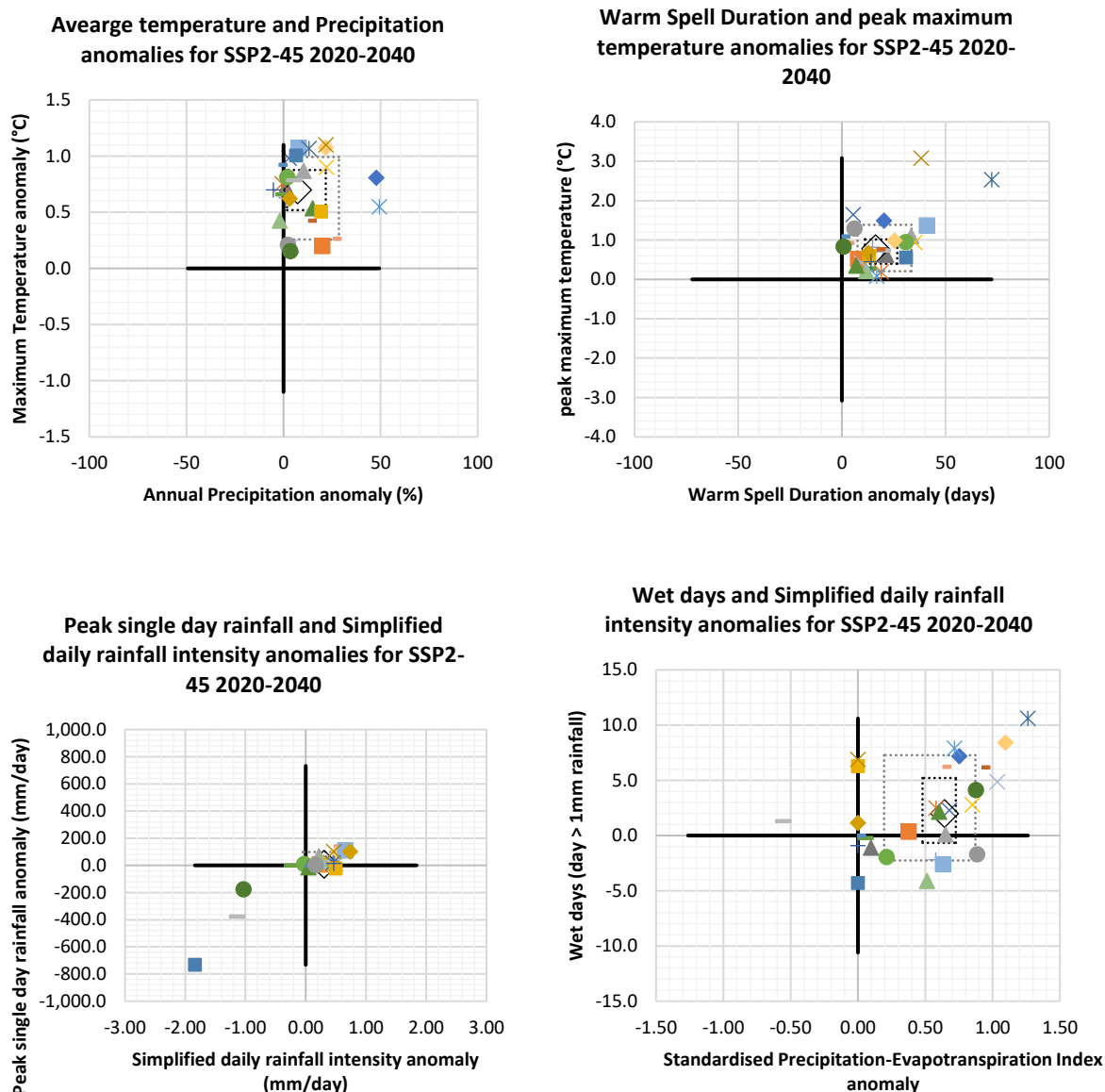
The projected future climate for Unity State indicates substantial increases in extreme temperature parameters, highlighting significant warming trends that will affect human health, agriculture, and infrastructure. Warm spells are expected to become notably longer, with a statistically significant trend of 13.47 days per decade. From an average of 18.8 days annually (2015–2035), warm spell durations are projected to reach 29.75 days by 2020–2050, with a 95% confidence range of 16.12–21.47 days, indicating prolonged periods of extreme heat.

Days with temperatures exceeding 25°C are projected to persist throughout the year, averaging 365 days annually. Meanwhile, the frequency of days above 35°C, or "hot days," is expected to increase significantly by 7.4 days per decade. From an average of 161.89 days annually, the number of hot days is projected to reach 170.35 days by mid-century, with a 95% confidence range of 159.12–164.66 days. Extremely hot days exceeding 40°C are also projected to rise sharply, increasing by 6.01 days per decade. From an average of 33.88 days annually, this figure is expected to climb to 40.24 days by 2050, with a 95% confidence range of 31.85–35.92 days.

Peak single-day maximum temperatures are projected to increase significantly, with a trend of 0.27°C per decade. From an average of 42.8°C (2015–2035), peak temperatures are expected to rise to 43.15°C by 2050, with a 95% confidence range of 42.68–42.92°C. This underscores the increasing intensity of heatwaves and extreme heat events.

Nighttime temperatures are also projected to rise substantially. Tropical nights (temperatures above 20°C) are expected to increase by 1.3 nights per decade, rising from an average of 354.12 nights annually to 356.68 nights by 2050. The 95% confidence range for tropical nights is 353.11–355.14 nights, signalling a near-continuous occurrence of warm nights. Additionally, the lowest daily minimum temperatures are projected to increase by 0.27°C per decade, from an average of 17.65°C (2015–2035) to 17.99°C by mid-century, reducing cooling relief during nighttime hours.

These increases in extreme temperature events will have far-reaching implications for Unity State. Longer warm spells and more frequent hot days will exacerbate heat stress for both humans and livestock, increase water demands, and reduce agricultural productivity. Higher nighttime temperatures will disrupt recovery periods, impacting vulnerable populations, including children, the elderly, and outdoor workers.



*Figure 0-18. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*

### Upper Nile

The projected future climate for Upper Nile State indicates a significant increase in rainfall and intensification of extreme rainfall events, pointing to a wetter climate with potential implications for agriculture, water management, and infrastructure. Mean annual rainfall is projected to increase at a statistically significant rate of 0.46% per decade, equivalent to 4.8 mm per decade. From an average value of 1,041 mm annually (2015–2035), rainfall is expected to rise to 1,053 mm annually by 2020–2050. The 95% confidence range for annual rainfall is between 1,027.29 mm and 1,053.85 mm, highlighting a consistent upward trend in precipitation.

Heavy rainfall events are also expected to increase in frequency. Days with rainfall exceeding 20 mm are projected to rise at a statistically significant rate of 0.09 days per decade. From an average of 0.87 days annually, this figure is anticipated to range between 0.77 and 0.97 days annually by mid-century.

However, days with rainfall exceeding 50 mm are expected to remain extremely rare, with no projected increase.

Indicators of rainfall intensity show statistically significant increases. Single-day peak rainfall magnitudes are projected to rise by 0.23 mm per decade. From an average of 21.16 mm (2015–2035), single-day peaks are expected to range between 20.81 and 21.51 mm. Similarly, the five-day peak rainfall magnitude is projected to increase by 0.7 mm per decade, from an average of 62.85 mm to a range of 62.11–63.6 mm, indicating a potential for more sustained heavy rainfall events.

Monthly cumulative rainfall during the wettest periods is also projected to increase significantly, with peak monthly totals rising by 1.33 mm per decade. From an average of 229.64 mm (2015–2035), monthly peaks are expected to range between 226.02 mm and 233.27 mm by mid-century, reflecting an intensification of the region's heaviest rainfall periods.

These changes in rainfall and extreme precipitation events will have important implications for Upper Nile State. Increased annual rainfall and more frequent heavy rain events could support agricultural productivity and water availability, particularly in rain-fed systems. However, the intensification of peak rainfall events raises concerns about flooding, soil erosion, and infrastructure resilience. Investments in water management systems, flood mitigation infrastructure, and climate-resilient agricultural practices will be essential to manage these changes effectively and mitigate associated risks while leveraging the potential benefits of increased rainfall.

The projected future climate for Upper Nile State suggests moderate changes in drought conditions, dry and wet spell durations, and atmospheric moisture levels, reflecting subtle shifts in water availability and climatic patterns. The Standardized Precipitation-Evapotranspiration Index (SPEI), a critical measure of drought severity, is projected to increase significantly by 0.05 per decade. With an average value of 0.11 (2015–2035) and a 95% confidence range of 0.03–0.19, this trend indicates fewer severe droughts in the future, suggesting improved conditions for water availability and agricultural systems.

Consecutive dry days are projected to decrease slightly, with a trend of -0.06 days per decade. From an average of 88.29 days annually, dry spells are expected to range between 87.25 and 89.33 days. This decline, although not statistically significant, suggests a minor reduction in the duration of dry periods. Similarly, consecutive wet days show a slight decrease of -0.17 days per decade. From an average of 45.62 days annually, wet spells are expected to range between 43.73 and 47.51 days, reflecting minimal changes in the length of rainy periods.

Relative humidity, an important indicator of atmospheric moisture, is projected to decrease significantly at a rate of -0.12% per decade. From an average value of 54.15% (2015–2035), relative humidity is expected to decline slightly to 54.17% by 2020–2050, with a 95% confidence range of 53.94–54.36%. This drying trend in the atmosphere could counteract some of the benefits of reduced drought severity, potentially impacting evapotranspiration rates and soil moisture.

Upper Nile State is expected to experience fewer severe droughts and minor reductions in dry spell durations, which could enhance agricultural productivity and water availability. However, the statistically significant decline in relative humidity highlights potential challenges related to atmospheric drying. To adapt effectively, investment in sustainable water management practices, climate-resilient agriculture, and infrastructure improvements will be critical for maintaining resilience and supporting livelihoods in the face of these changing climatic conditions.

The projected future climate for Upper Nile State shows significant warming trends across all temperature metrics, reflecting a clear trajectory of rising temperatures with implications for human health, agriculture, and infrastructure. The mean maximum temperature is expected to increase at a statistically significant rate of 0.2531°C per decade. With an average value of 34°C (2015–2035) and a 95% confidence range of 34.1–34.28°C, maximum temperatures are projected to reach 35°C by 2020–2050. This sustained increase highlights the persistence of high daytime temperatures, contributing to heat stress and water demand.

Mean temperatures are also projected to rise significantly, with a trend of 0.26°C per decade. From an average of 29.12°C (2015–2035), mean temperatures are anticipated to reach 29.44°C by mid-century, with a 95% confidence range of 29.04–29.2°C. This consistent warming reflects an overall shift toward a hotter climate, which could affect agricultural cycles, ecosystems, and energy use.

Minimum temperatures are expected to show the most pronounced increase, with a statistically significant trend of 0.26°C per decade. From an average of 24.01°C (2015–2035), minimum temperatures are projected to rise to 24.35°C by 2050, with a 95% confidence range of 23.93–24.1°C. This indicates warmer nights, which may reduce the cooling relief typically experienced during nighttime hours and exacerbate the impacts of prolonged heat exposure on vulnerable populations.

These projected increases in temperature metrics will likely have widespread effects in Upper Nile State. Higher maximum temperatures may increase evapotranspiration rates, reducing water availability for crops and livestock. Rising mean temperatures could stress agricultural productivity, while higher minimum temperatures may affect human comfort, productivity, and health by limiting nighttime cooling.

The projected future climate for Upper Nile State reveals significant increases in extreme temperature parameters, indicating a trend toward more intense and prolonged heat conditions. Warm spells are expected to increase markedly, with a statistically significant trend of 12.86 days per decade. From an average of 18.84 days annually (2015–2035), the duration of warm spells is projected to rise to 28.6 days by 2020–2050, with a 95% confidence range of 16.72–20.96 days. This highlights the likelihood of longer periods of extreme heat, affecting ecosystems, agriculture, and human health.

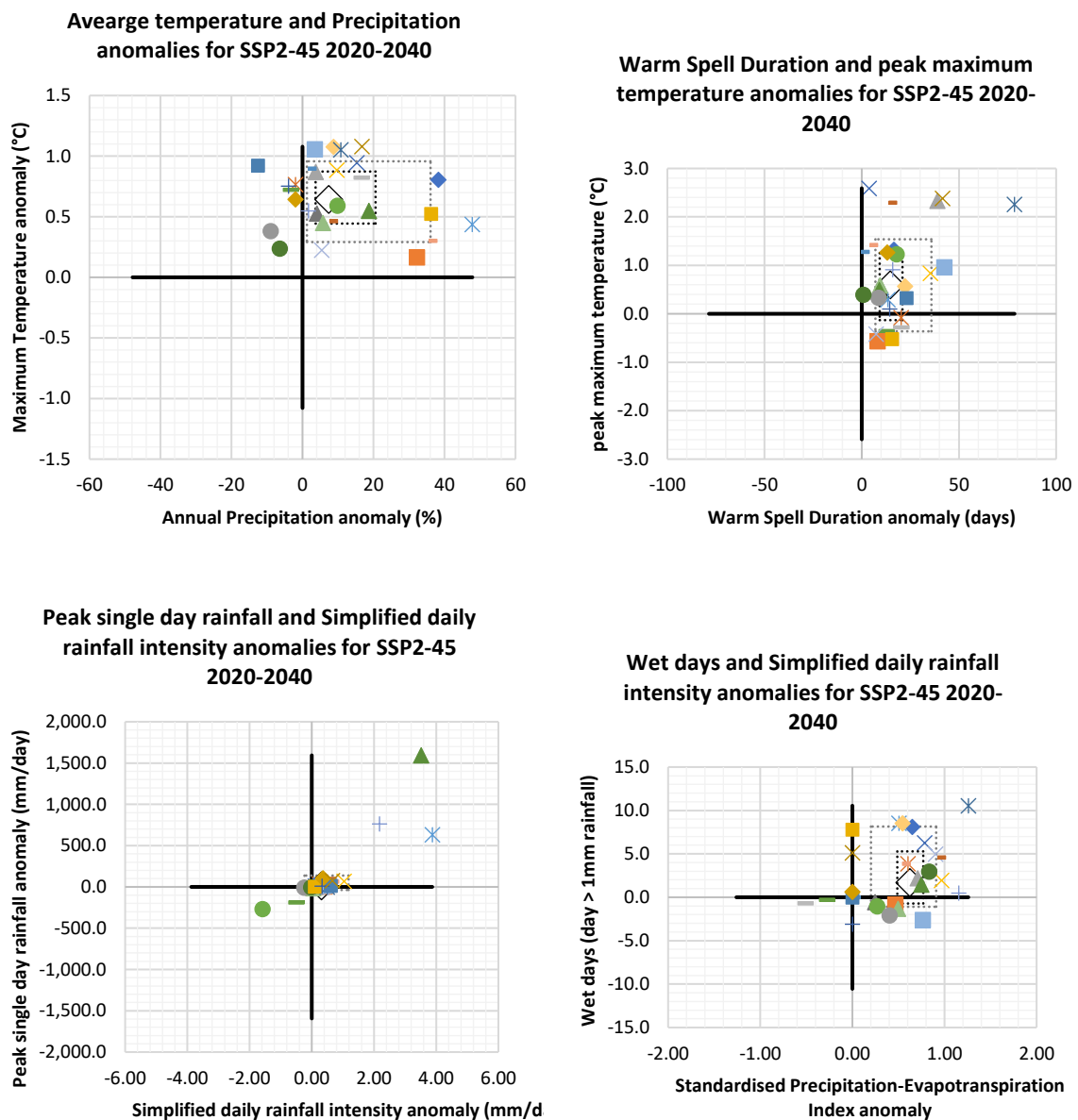
Days with temperatures exceeding 25°C are projected to remain constant at 365 days annually, indicating a year-round prevalence of warm conditions. However, the frequency of days exceeding 35°C, or "hot days," is projected to increase significantly by 7.9 days per decade. From an average of 148.96 days annually, the number of hot days is expected to reach 158.19 days by mid-century, with a 95% confidence range of 146.42–151.5 days. Extremely hot days exceeding 40°C are also anticipated to rise sharply, with a projected increase of 5.75 days per decade. From an average of 25.86 days annually, this figure is expected to climb to 31.25 days by 2050, with a 95% confidence range of 24.02–27.7 days.

Peak single-day maximum temperatures are projected to increase at a statistically significant rate of 0.27°C per decade. From an average of 42.33°C (2015–2035), peak temperatures are expected to rise to 42.65°C by mid-century, with a 95% confidence range of 42.22–42.44°C. This trend underscores the increasing intensity of heatwaves and extreme temperature events.

Nighttime temperatures are also projected to rise significantly. Tropical nights (temperatures exceeding 20°C) are expected to increase by 0.98 nights per decade, rising from an average of 356.81 nights annually to 358.69 nights by 2050. The 95% confidence range for tropical nights is 356.12–357.5 nights, indicating almost constant warm nighttime conditions. Additionally, the lowest daily minimum

temperatures are projected to rise by 0.25°C per decade, from an average of 18.12°C (2015–2035) to 18.44°C by mid-century, reducing nighttime cooling and increasing heat stress.

These changes in extreme temperature events will have significant implications for Upper Nile State. Longer warm spells and more frequent hot days will heighten the risks of heat stress for humans and livestock, reduce agricultural productivity, and increase water demand. The rise in nighttime temperatures will limit recovery from daytime heat, impacting vulnerable populations such as children, the elderly, and outdoor workers.



*Figure 0-19. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)*



## Warrap

The projected future climate for Warrap State indicates a significant increase in rainfall and intensification of extreme rainfall events, reflecting a wetter climate with potential implications for agriculture, water resources, and flood management. Mean annual rainfall is expected to rise at a statistically significant rate of 0.54% per decade, equivalent to 5.48 mm per decade. From an average of 1,014 mm annually (2015–2035), rainfall is projected to increase to 1,027 mm annually by 2020–2050, with a 95% confidence range of 1,001.56–1,026.82 mm.

The frequency of heavy rainfall events is also projected to increase. Days with rainfall exceeding 20 mm are expected to rise at a statistically significant rate of 0.06 days per decade. From an average of 0.96 days annually, this figure is projected to range between 0.88 and 1.03 days annually by mid-century. However, days with rainfall exceeding 50 mm are expected to remain absent, with no projected change.

Rainfall intensity metrics show significant upward trends. Single-day peak rainfall magnitudes are projected to increase by 0.32 mm per decade, from an average of 21.72 mm (2015–2035) to a range of 21.31–22.13 mm. Similarly, the five-day peak rainfall magnitude is projected to rise by 0.53 mm per decade, from an average of 60.73 mm to a range of 59.9–61.55 mm, indicating more sustained heavy rainfall events.

Monthly cumulative rainfall during the wettest periods is also projected to increase significantly, with peak monthly totals rising by 1.12 mm per decade. From an average of 220.35 mm (2015–2035), monthly peaks are expected to range between 217.2 mm and 223.5 mm by mid-century, highlighting an intensification of the region's heaviest rainfall periods.

These changes in rainfall patterns and extreme events suggest both opportunities and challenges for Warrap State. Increased annual rainfall and heavy rain events could enhance water availability for agriculture and ecosystems. However, the intensification of peak rainfall events raises concerns about flooding, soil erosion, and the resilience of infrastructure. Effective water management systems, flood mitigation strategies, and sustainable agricultural practices will be critical to harnessing the benefits of increased rainfall while minimizing associated risks.

The projected climate for Warrap State indicates evolving patterns of drought severity, dry spells, and atmospheric moisture, with both promising and concerning implications. The Standardized Precipitation-Evapotranspiration Index (SPEI), a key measure of drought severity, is projected to increase significantly by 0.05 per decade, suggesting fewer and less severe droughts in the future. With an average SPEI value of 0.15 (2015–2035) and a 95% confidence range of 0.06–0.24, this trend reflects improving conditions for water availability and reduced drought intensity.

The duration of consecutive dry days is expected to decrease slightly at a rate of -0.08 days per decade, from an average of 79.85 days annually. This reduction, while not statistically significant, hints at fewer prolonged dry periods, with a 95% confidence range of 79.07–80.63 days. Conversely, consecutive wet days are projected to decline marginally by -0.29 days per decade, from an average of 47.71 days annually, with a 95% confidence range of 45.63–49.8 days. Though this decrease is also not statistically significant, it underscores subtle shifts in rainfall patterns.

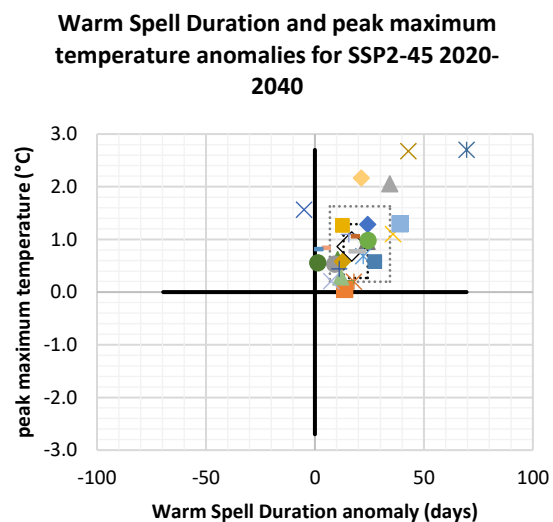
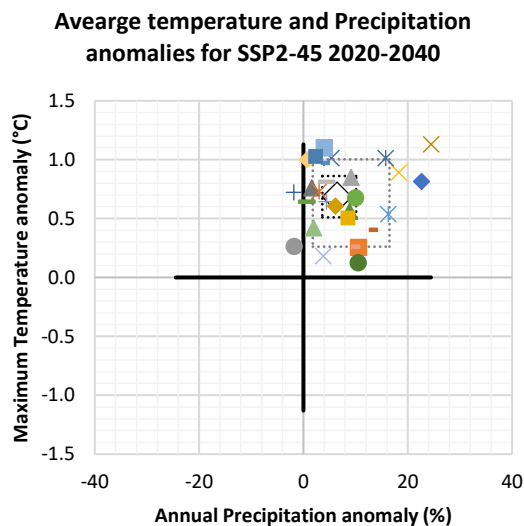
Relative humidity, a critical factor influencing evaporation and soil moisture retention, is projected to decline significantly by -0.1% per decade. From an average value of 52.21% (2015–2035), relative humidity is expected to decrease to 52.31% by 2020–2050, with a 95% confidence range of 51.98–52.44%. This decrease may compound the effects of rising temperatures, leading to increased dryness despite improvements in drought severity.

Projections for Warrap State indicate significant increases in extreme temperature events and warm conditions, with important implications for environmental and human systems. The warm spell duration, a critical indicator of prolonged heat, is expected to rise significantly by 13.21 days per decade, increasing from an average of 19.35 days annually to 28.85 days by 2020–2050. This statistically significant trend, with a 95% confidence range of 16.89–21.82 days, highlights the growing persistence of extreme heat events.

The frequency of days exceeding 35°C, classified as hot days, is also projected to increase significantly by 7.15 days per decade. This rise would bring the number of annual hot days from an average of 171 days (2015–2035) to 179.13 days by 2020–2050, with a 95% confidence range of 167.95–174.06 days. Even more extreme are the days exceeding 40°C, categorized as extremely hot days, which are expected to rise significantly by 6.31 days per decade. This trend increases the average from 36.25 days annually to 42.75 days by 2020–2050, with a 95% confidence range of 34.08–38.42 days.

Peak single-day temperatures, an indicator of the hottest days experienced in a year, are expected to rise by 0.27°C per decade, from an average of 42.88°C to 43.21°C by 2020–2050. This trend is statistically significant, with a 95% confidence range of 42.77–43°C. Nights with temperatures exceeding 20°C, or tropical nights, are projected to increase significantly by 1.13 nights per decade, raising the total from 355.57 nights annually to 357.66 nights by 2020–2050, with a 95% confidence range of 354.67–356.48 nights.

Finally, the lowest daily temperatures, representing the coldest nights of the year, are expected to rise by 0.26°C per decade, increasing from an average of 17.92°C (2015–2035) to 18.23°C by 2020–2050. These changes, driven by statistically significant trends, indicate the warming of even the coolest days and nights in Warrap State.



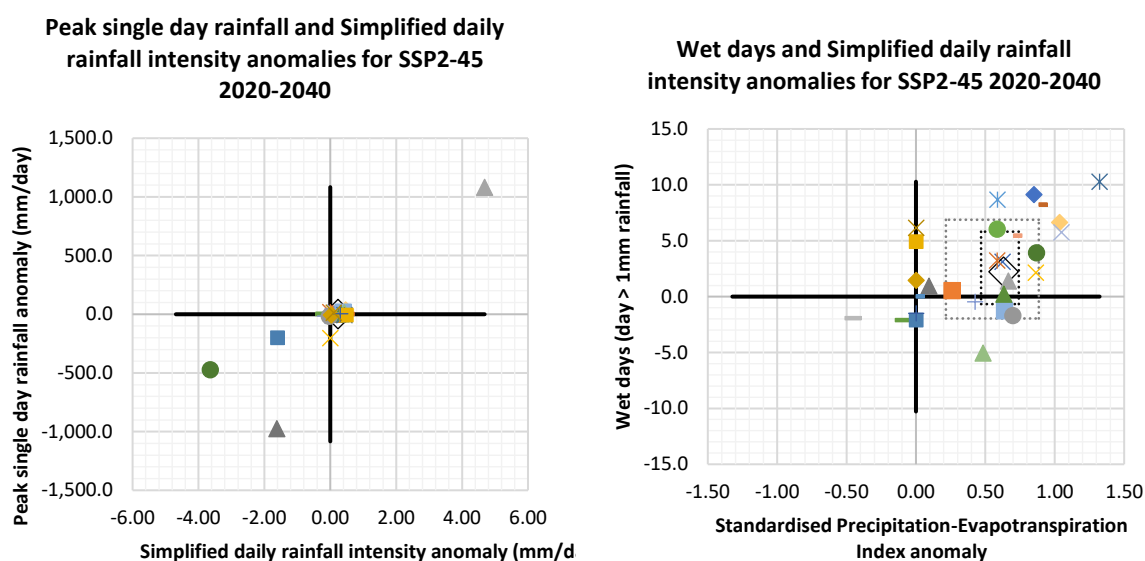


Figure 0-20. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

## Data utilised

Climate data was based on the CMIP6 SSP2-4.5 climate scenario. The CMIP6 project expands on previous phases of the Coupled Model Intercomparison Project (CMIP), which have provided valuable information on the past and future evolution of the Earth's climate system. This analysis is based on CMIP6 data, which includes 134 models from 53 modelling centres. The publication of CMIP6 data began in 2019, with the majority of the data by 2022, with CMIP6 scientific analyses used in the IPCC's 6th Assessment Report (AR6).<sup>252</sup>

- WorldClim: WorldClim data is a set of bias-corrected, high-resolution, downscaled climate models that can be used for detailed spatial analysis of an area's climate changes. The data used has a downscaled resolution of ~10km and presents a temporal average of the climate from 2021-2040 representing the near-term projection.<sup>253</sup>
- The Climate Change Knowledge Portal (CCKP): the CCKP is a hub for climate-related information, data, and tools which provides an online platform from which to access and analyse comprehensive data related to climate change and development. The data used has a downscaled resolution of ~50km and presents a temporal average of the climate from 2020-2039 representing the near-term projection.<sup>254</sup>
- Copernicus Climate Change Service (C3S): This dataset provides aridity indicators useful for climate and vegetation interaction assessment.<sup>255</sup>

<sup>252</sup> ECMWF, CMIP6 climate projections and information.

<sup>253</sup> Hijmans, R.J., S.E. Cameron, J.L. Parra, P.G. Jones and A. Jarvis, 2005. Very high-resolution interpolated climate surfaces for global land areas. *International Journal of Climatology* 25: 1965-1978

<sup>254</sup> World Bank Group, Climate Change Knowledge Portal (2024). URL: <https://climateknowledgeportal.worldbank.org/>

<sup>255</sup> Nobakht, M., Beavis, P., O'Hara, S., Hutjes, R., Supit, I., (2019): Agroclimatic indicators from 1951 to 2099 derived from climate projections. Copernicus Climate Change Service (C3S) Climate Data Store (CDS). DOI: 10.24381/cds.dad6e055

- Köppen-Geiger climate classification: Maps present global maps of the Köppen-Geiger climate classification at a high resolution for historical and future climate conditions. The data used has a downscaled resolution of 1km and presents a temporal AVERAGE of the climate from 2041-2070 representing the medium-term projection.<sup>256</sup>
- Climate research unit (CRU) data 4.06 release. The CRU TS dataset was developed and has been subsequently updated, improved, and maintained with support from several funders, principally the UK's Natural Environment Research Council (NERC) and the US Department of Energy. Long-term support is currently provided by the UK National Centre for Atmospheric Science (NCAS), a NERC collaborative centre.<sup>257</sup>

### 3.2.5 Climate change impacts

The following provides a snapshot of the climate change impacts in South Sudan on the education sector, food systems, health and wellbeing, and the disproportionate impacts on marginalised people.

#### 3.2.5.1 Children and education

Children are the most affected by climate change, yet they contribute to it the least. Climate change is an urgent global challenge with far-reaching impacts, especially on vulnerable populations. South Sudan, a country plagued by conflict and poverty, is experiencing severe consequences of climate change. Children, in particular, are among the most affected, facing threats to their health, education, and overall well-being.

South Sudan is ranked 7<sup>th</sup> worldwide in children's exposure to climate change and environmental shocks. According to the Education Sector Analysis 2023, disasters "have severely impacted children's education in South Sudan, both directly – by putting children's and teachers' lives and well-being at risk and destroying education infrastructure – and indirectly through impacts associated with food insecurity, land loss, forced migration, child labour and child marriage, among others". It is important to note that most schools in South Sudan are in areas prone to conflict, drought, and flood.<sup>258</sup>

A risk analysis conducted alongside the 2023 education sector analysis "brought to light a notable misalignment between the prevailing school calendar and the recurring patterns of seasonal flooding. Specifically, the months of July to September, when educational activities are in full swing, consistently witness severe flooding, whereas the floodwaters tend to recede in December and January, coinciding with school holidays".<sup>259</sup>

The impacts of climate change have multiple impacts on children and education as outlined below.

#### **School infrastructure damage and disruption to education**

Climate-induced disasters frequently disrupt educational activities. Floods and droughts force families to migrate in search of safer areas, interrupting children's education. Many schools are damaged or

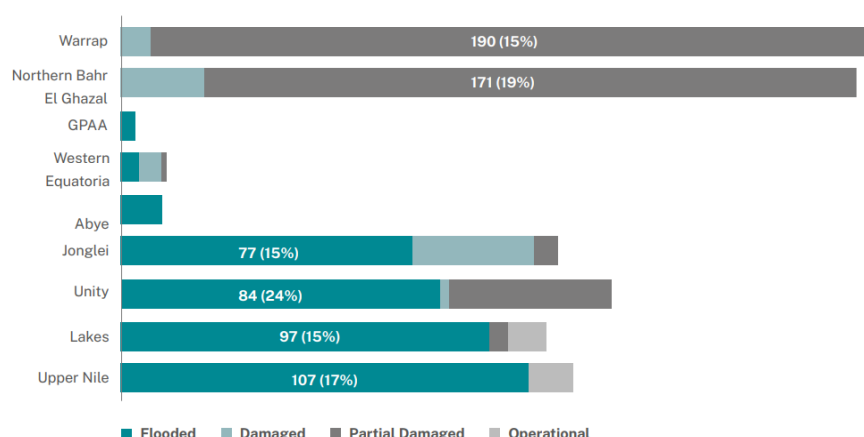
<sup>256</sup> Beck, H.E., T.R. McVicar, N. Vergopolan, A. Berg, N.J. Lutsko, A. Dufour, Z. Zeng, X. Jiang, A.I.J.M. van Dijk, D.G. Miralles. High-resolution (1 km) Köppen-Geiger maps for 1901–2099 based on constrained CMIP6 projections. *Scientific Data* 10, 724, doi:10.1038/s41597-023-02549-6 (2023)

<sup>257</sup> Harris, I., Osborn, T.J., Jones, P. et al. Version 4 of the CRU TS monthly high-resolution gridded multivariate climate dataset. *Sci Data* 7, 109 (2020). <https://doi.org/10.1038/s41597-020-0453-3>

<sup>258</sup> UNICEF: The climate crisis is a child rights crisis. [Available here](#)

<sup>259</sup> Education cluster strategy. [Available here](#)

destroyed by these events, and those that remain often serve as shelters for displaced families, further hindering educational access. Displacement further impacts children's access to continuous education. More than 800,000 people were displaced by the 2021 floods; by 2022 this figure increased to 100,000 with children constituting 52% of the affected population.<sup>260</sup>



### Number and percentage of schools affected by flooding, by state (2022)<sup>261</sup>

In March 2014, temperatures recorded up to 40-45°C in schools, and heatwaves were reported by the Ministry of Environment and Forestry. Schools were advised to shut down, else their registration would be withdrawn. School children were encouraged to stay cool indoors.<sup>262 263 264</sup>

The Table below summarizes these climate and education related impacts affecting infrastructure, attendance, and overall educational outcomes and potential BRACE interventions for the targeted States in South Sudan.

### Summary of state-level climate projections, risk and interventions

| State   | Climate hazard  | Climate projection and risk  | Potential intervention   |
|---------|---|--|--|
| Jonglei | Flash flooding  | Increased soil aridity, increased runoff, water discharge and intense rainfall leading to flash floodings.   | Climate-proof school building to curb flash flooding or school submergence (1.2.2)   |
| Unity   | Flash flooding<br>Heatwaves<br>Temperature related<br>wildfires | Reduced number of frost days due to increase in tropical nighttime warming. Increased soil aridity, decreased soil moisture will reduce up to 8% by 2040. Risks related to agriculture and food security, increase drought re-occurrence and wildfire events, increased heat stress. | Water harvesting in schools during wet seasons, to make water available for cool-off and to respond to wildfire emergencies in schools (1.2.2), tree planting and schoolyard gardening to absorb extreme heat conditions (1.2.2) |

<sup>260</sup> Flood risks reports in South Sudan. [Available here](#)

<sup>261</sup> IIEP: Education Sector Analysis for South Sudan. [Available here](#)

<sup>262</sup> Weather advisory from Ministry [of Environment and Forestry, South Sudan](#)

<sup>264</sup> BBC, 18 March 2024: South Sudan heatwave: Extreme weather shuts schools and cuts power. [Available here](#)

|                   |                       |  |  |
|-------------------|-----------------------|--|--|
| Upper Nile        | Flooding<br>Heatwaves | The Upper Nile experiences the most temporal and varied precipitation and dry spells because of the continental air mass oscillation in South Sudan. Highest relative humidity level as compared to other States. Highest records of warm tropical nights 31.0°C. The risk is increasing extreme events of a higher magnitude.   | Passive cooling of classroom to improve thermal comfort of students (1.2.2), retrofit building orientation and facades to take advantage of prevailing wind (westerlies) (1.2.2), plant trees to serve as windbreakers for school building and roofs during storm surges (1.2.2)   |
| Warrap            | Wildfires<br>Flooding | Rising temperatures and expanding invasive grass land, are likely to increase the frequency of wildfires, which have been observed since 1981. Wildfire would disrupt learning in schools. Flooding would alter alternative education programs in hard-to-reach areas and pastoralist communities  | Schools have capacity to curb fire outbreaks, fire drills activities as part of anticipatory plans for wildfire outbreaks. (1.3.3) Schools to serve as emergencies centres for wildfire recovery and flood management and recovery, retrofit school infrastructure to be resilient to flooding (1.3.3)   |
| Lakes             | Flooding              | Currently, flooding is disrupting school activities. RCP 8.5 projection showed a 7% drop in soil moisture, and a 2% decrease in precipitation by 2040. This will significantly increase naturally occurring droughts conditions, wildfires related to high temperatures and heat, flooding, and extreme climatic conditions with children and fragile elderly people at risk of malaria and unsafe drinking water.   | Climate-proof school infrastructure to be resilient to flood risk. Schools should be able to install rain harvesting facilities to take advantage of rains during the wet seasons (1.2.2), and fire extinguishers and hydration stations to ensure water availability and curb fire outbreaks during dry spells condition.                                   |
| Eastern Equatoria | Flooding<br>Heatwaves | Rainfall is bimodal with two peaks occurring in May and July. At least 4 days of rainfall in a month. The moist air caused by the pulsation of Northern tropical continental air mass and the Southern maritime continental air mass would increase relative humidity in the afternoon and would cause heating of school buildings. There would be air upwelling as a result of eddies and the air will be very hot during sunny days. Climate-proof school building to curb excessive heat during hot days. The State also receives the most rainfall due to convective activities. | It is important to make school buildings resilient to flooding (1.2.2)<br>Passive cooling of classrooms to improve thermal comfort of students (1.2.2), retrofit building orientation and facades to take advantage of prevailing wind (westerlies) (1.2.2), plant trees to serve as windbreakers for school building and roofs during storm surges (1.2.2). |

### 3.2.5.2 Food systems

Flooding has significant impacts on agriculture in South Sudan, affecting food security, livelihoods, and the overall economy. Here are some key impacts:

#### Crop destruction

- **Submerged fields:** Floods often submerge agricultural fields, destroying crops either through waterlogging or by physically washing them away.<sup>265</sup> This results in the loss of entire harvests, particularly affecting staple crops like sorghum, maize, and millet.
- **Delayed planting and harvesting:** The flooding season often coincides with critical planting or harvesting periods, leading to delays or preventing these activities altogether. This reduces crop yields and disrupts agricultural cycles.

#### Soil degradation

- **Nutrient leaching:** Prolonged flooding can lead to the leaching of essential soil nutrients, reducing soil fertility and productivity in subsequent planting seasons.
- **Erosion:** Floodwaters can cause significant soil erosion, stripping away the topsoil that is vital for crop growth and leaving fields less productive or entirely barren.

#### Livestock losses

- **Drowning and disease:** Livestock can drown during floods or suffer from diseases due to the wet conditions and lack of dry grazing areas. The loss of livestock severely impacts pastoralist communities that rely on animals for food, income, and cultural practices.
- **Grazing land degradation:** Floods can destroy grazing lands, reducing the availability of pasture for animals and leading to conflicts over the remaining resources.

#### Displacement and food security

- **Human displacement:** Flooding often forces farming communities to abandon their homes and fields, leading to displacement and food insecurity. Displaced farmers lose their source of income and struggle to rebuild their livelihoods in new areas.
- **Increased dependency on aid:** The destruction of crops and livestock increases dependency on humanitarian aid, as local food production becomes insufficient to meet the community's needs.

#### Economic impact

- **Income loss:** The destruction of crops and livestock leads to significant income losses for farmers, who are often already living in poverty. This economic impact extends to local markets and economies, as agricultural production is a major economic activity in South Sudan.
- **Markets:** Flooding disrupts local and regional markets, affecting the supply chain of agricultural products. This can lead to increased food prices and reduced availability of food in the markets.

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<sup>265</sup> Map showing flood impacts on cropland in South Sudan can be provided on request.



### *3.2.5.3 Health and Wellbeing*

#### **Malnutrition and food insecurity**

South Sudan's predominantly agrarian society relies heavily on seasonal rains for food production. Climate change has disrupted these patterns, leading to droughts and floods that devastate crops and livestock. Consequently, food insecurity has escalated, with children suffering acute malnutrition. According to UNICEF, nearly 1.3 million children under 5 are acutely malnourished, making them susceptible to diseases and stunted growth. Malnutrition and food insecurity results in children struggling to concentrate, impacts their learning outcomes, and increases the risks of dropping out of school.<sup>266</sup>

#### **Health risks, including waterborne diseases**

Increased flooding and unpredictable rainfall patterns have contaminated water sources, exacerbating the spread of waterborne diseases such as cholera and diarrhoea. Children, with their underdeveloped immune systems, are particularly vulnerable to these diseases, which can be fatal if untreated. The scarcity of clean drinking water further compounds the issue, as families are forced to rely on unsafe water sources. South Sudan's health system relies heavily on international humanitarian assistance and struggles to provide basic essential life-saving health services. Limited health facilities, and poor coverage, have made it difficult to meet additional health needs posed by floods. Consequently, over 390,000 children have no access to health services while 17,729 children suffer from severe acute malnutrition.<sup>267</sup> School attendance rates have worsened in the areas affected by floods.<sup>104</sup> In addition, "rising temperatures, as well as increased rainfall and flooding, may increase the spread of vector and waterborne diseases. Flooding has also led to an increase in snake bites, especially among children and women"<sup>268</sup>.

#### **Psychological stress**

The recurrent climate disasters and the resulting displacement cause significant psychological stress for children. The trauma of losing homes, loved ones, and the constant instability can lead to long-term mental health issues, including anxiety and depression. The lack of mental health services in the region means that affected children often do not receive the support they need.

#### **Intersectionality and GBV**

Climate change results in increased education inequity for marginalised groups of people, including girls, children with disabilities and children within pastoralist communities who continue to be disproportionately affected by the impacts of climate change. According to the MOGEI, ESA, 2023 "because of climate change, girls and women must walk longer distances to find drinking water, food, and so forth, which exposes them to a high risk of sexual violence, including rape".<sup>269</sup>

### *3.2.5.4 Climate Change Impacts Disproportionately on Marginalised Groups*

South Sudan's socio-political instability, coupled with environmental vulnerabilities, has left marginalised groups disproportionately affected by the adverse impacts of climate change. These

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<sup>266</sup> *ibid*

<sup>267</sup> *ibid*

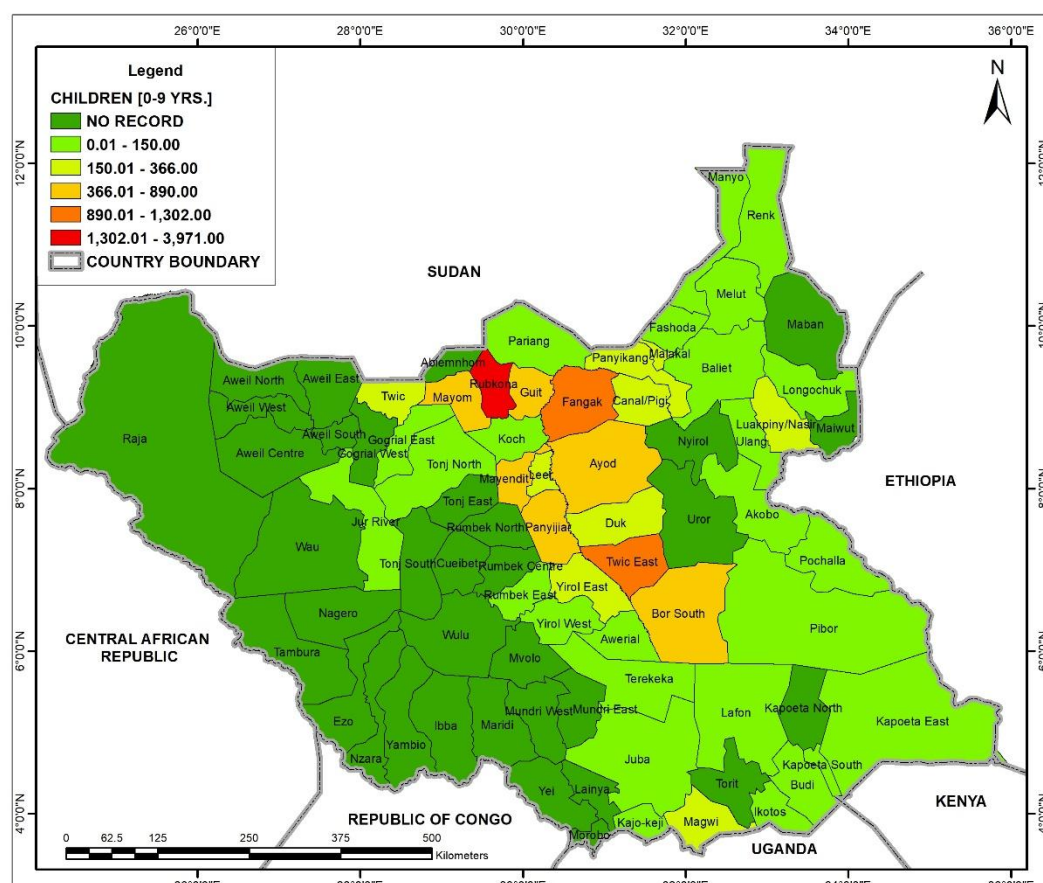
<sup>268</sup> *ibid*

<sup>269</sup> *ibid*

marginalised groups are often part of the school community, i.e. potentially students, parents/primary carers, or family members living and working within the areas surrounding schools.

## Children

- **Increased child labour:** As families struggle to cope with the economic strain caused by climate change, children are often compelled to work to supplement household income and drop out of school. This can involve hazardous labour in agriculture or other sectors, depriving them of their childhood and education, and exposing them to further physical and psychological harm.
- **Child protection risks:** Displacement and the breakdown of community structures increase the risk of child exploitation and abuse. Children separated from their families are particularly vulnerable to trafficking, forced labour, and recruitment by armed groups. The instability caused by climate change exacerbates these protection risks, making it harder for authorities to provide adequate safeguards. As shown in the Figure below, Rubkona, Fangak, Twic, Twic east, Bor South, Ayod, and Guit has the largest population of school children at risk to climate change impacts.



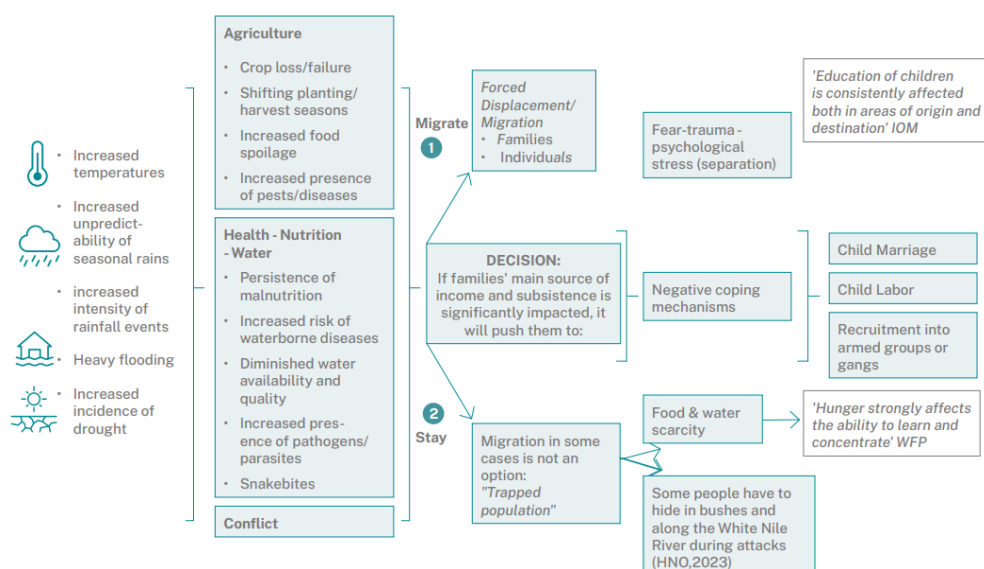
Number of children (0-9) impacted by climate change (Source: United Nations WFP, 2024<sup>270</sup>)

## Internally Displaced Persons (IDPs)

South Sudan hosts a significant number of IDPs due to ongoing conflicts and environmental disasters. Climate change exacerbates displacement, with floods and droughts driving people from their homes. IDPs live in precarious conditions, with limited access to clean water, sanitation, and healthcare.

<sup>270</sup> ibid

Overcrowded camps become breeding grounds for diseases, and the lack of resources hinders effective climate adaptation.



Source: Elaborated by the authors.

Source IIEP, 2023

## Women

Women in South Sudan are predominantly responsible for agricultural activities and water collection. Climate change-induced droughts and floods reduce agricultural yields, forcing women to travel further to find water and arable land. This increases their workload and exposure to violence and exploitation. Additionally, traditional gender roles limit their access to education and decision-making processes, impeding their ability to adapt to climate-related challenges.

## Elderly

The elderly population, often dependent on family support and community networks, faces heightened risks due to climate change. Their physical vulnerabilities make it harder for them to adapt to environmental changes, and they are often left behind during displacements caused by extreme weather events. Additionally, traditional knowledge held by the elderly about local environmental management is increasingly disregarded, limiting community resilience. If their indigenous knowledge is effectively harnessed, it would aid in reducing the impacts of climate change in these locations; if disregarded, climate change impacts could be heightened.

## 3.3 Adaptation Gaps and Adaptation Actions

Climate change adaptation gaps are well documented and point to the vulnerability of school children and other community members surrounding schools, as well as school infrastructure, systems and services. It is very likely that these gaps, driven by a lack of coordinated and well-planned investment, if left unabated will widen. The impact might be drastic in a short time frame, given the intensification of climate change hazards such as floods, drought, temperature and drought related wildfires, and heat stress. Climate-related education impacts are therefore set to worsen, contributing to further vulnerability of school children and their school facilities, as well the whole education system. The impacts for South Sudan include but are not limited to: increased injuries, death, absenteeism, gender inequality, early forced marriages, under-development, future unemployment, school temporary/permanent closures and school relocations, degraded/broken school facilities, hazardous school settings for children and teachers, migration, child-modern slavery, inability to attract future

private finance, inability to integrate climate and education curriculum, policies and programming, inability to provide or access local EWS and CIS, and inability to safeguard school children including protecting child rights and raising children's voices.

BRACE offers an alternative future through its focus and investment on climate related education actions to address these climate hazards and gaps. The table below provides an overview of the selected interventions for South Sudan that address the adaptation gaps through climate action.

The Table below sets out identified adaptation action to minimise the climate vulnerability of schools in South Sudan.

| ADAPTATION ACTIONS: REDUCING DRIVERS OF VULNERABILITY TO CLIMATE CHANGE HAZARDS AND IMPACTS                          |  |  |                          |   |  |   |   |  |  |
|--|--|--|--------------------------|---|--|---|---|--|--|
| Reducing exposure  |  |  | Minimising vulnerability |   |  | Building adaptive capacity  |   |  |  |
| Historic exposure to climate hazards   | Isolation/ Lack of connectivity and access to climate and disaster information | School infrastructure close to river delta, exposed shoreline  | Unsafe surrounding       | Unsafe school infrastructure, poor condition and maintenance          | Lack of access to clean water and electricity in schools | Lack of disaster preparedness planning and awareness at school  | Lack of policies or strategies to coordinate climate change education policies between ministries   | Lack of teachers or capacity of teachers | Lack of specific practical climate change curriculum |
| Strengthen access to and use of Early Warning Systems (EWS) and Climate Information Systems (CIS) in schools (1.3.5) |  | Retrofit school facilities, including WASH and internet connectivity, to strengthen climate resilience (1.2.2) |                          | Upgrade and retrofit school infrastructure – e.g. ventilation (1.2.2) | Upgrade and retrofit WASH facilities (1.2.2)             | Revise minimum standards for education in emergencies (1.1.1)<br>School safety training including preparing school-level emergency plans (1.3.2, 1.3.3) | Implement a new climate change education policy (1.1.1) and ensure coordination at subnational levels between education and other ministries (1.1.2)<br>Train teachers on using climate change materials in the curriculum (1.4.2) and prepare document on influencing next curriculum revision (1.4.5) |  |  |
| Increase connectivity and access to national and local media (including radio) (1.3.5)                               |  | Protection infrastructure from the river and landslides  |                          | Relocate/build new school infrastructure (not possible)               |  | School disaster planning  |   |  |  |

|  |                                |  |  |   |                  |  |  |  |   |
|--|--------------------------------|--|--|---|------------------|--|--|--|---|
|  |                                |  |  | due to current ESS accreditation  |                  |  |  |  |   |
|  |                                |  |  | Training on basic upkeep and maintenance of school infrastructure and WASH facilities (1.3.2) | Emergency drills | Offer alternative classrooms and educational materials in case of climate-related disaster |  |  |   |
|  | Training in use of CIS and EWS |  |  |   |                  |  |  |  | Mainstreaming of climate change in current curriculum (currently done by TSRSP) |

### 3.4 Project description

The main climate drivers that pose a risk to South Sudan's education sector are flooding, drought and heatwaves (increasing temperatures) leading to an increase in the extreme weather events. These drivers and hazards impact the education sector directly, via deaths and injuries, psychosocial harm/mental distress and damage to school infrastructure, facilities and materials and educational disruption and indirectly, via an increase in absenteeism, drop-outs and negative impacts on families' livelihoods, food security, health and income as well as the wellbeing, safety and protection of children.

The BRACE project aims to strengthen the climate resilience of the education sector by helping to reduce and avoid significant impacts of climate change on educational assets, children, and access to learning. This will be achieved through ensuring that enabling systems and policies are in place by supporting the development of education and climate change policies and guidelines, strengthening coordination with the MoEs and between MoEs and other ministries, and facilitating integration of DRR into existing and new school plans. The project will ensure that school facilities are safer through investments to increase the physical resilience of school infrastructure and to ensure educational continuity management systems are in place and operating effectively. The project will also work with schools and the education sector to improve accessibility to climate information and e-learning and strengthen preparedness through training and materials; these will be designed to be appropriate to the local context to improve climate and disaster resilience planning.

#### Theory of change

**IF** the education stakeholders in South Sudan are better informed of climate risks and adaptation options for the education sector, as well as have access to global knowledge, policy exchange and financing, and **IF** the target schools are teaching children about climate change and become safer and greener, **THEN** the school systems of the target countries and beyond, including children and communities, become more resilient, **BECAUSE**, policies of the education sector becomes more responsive to climate change, there will be increased climate finance for the sector, Ministry of Education staff, students and communities will become more knowledgeable and engaged in climate adaptation actions and advocacy.

**BRACE's key barriers** in South Sudan that prevent the education sector from adequately addressing the main climate drivers are:

**Governance:** Lack of resources and capacity for effective enabling environment and institutional governance for climate action in education sector. The economic challenges faced by South Sudan mean that funding for education is often insufficient. This lack of financial support limits the ability to implement programmes and infrastructure improvements that address climate change impacts.

**Limited infrastructure and resources:** Many schools lack the physical infrastructure to withstand climate extremes, such as floods or extreme heat. Additionally, there is a shortage of educational materials and resources specifically focused on climate change and resilience.

**Cultural and social factors:** In some communities, there is limited awareness and/or understanding of climate change and its impact on education. Social norms and traditional practices affect the adoption of new approaches and technologies for climate resilience.

**Informational:** Limited access to relevant, high quality climate information for decision making in the education sector. There is lack of localized data on climate impacts and mitigation measures. This hinders any efforts to design and implement effective climate mitigation and adaptation strategies.

**Technological:** Low level of technical expertise with limited availability to support effective action. This has hindered the ability to enhance climate resilience programming through lack of tools and



solutions to enable communities, governments, and organizations to adapt to and mitigate the impacts of climate change.

**Institutional Management:** No central and interconnected ‘home’ for coordinating approaches and ensuring cross-learning.

**Gender and social inclusion:** Significant inequalities in access and educational attainment for girls and children with disabilities.

**Climate change risks:** Social-cultural and institutional barriers interact with key climate change risks such as increasing temperatures, changing rainfall patterns, and extreme weather events. These bring about an increase in droughts, floods, heat waves, crop destruction, and loss of land. This leads to deaths and injuries, damage to school infrastructure, disruptions to education, and negative impacts on household livelihoods, food security, and the health, safety, and protection of children.

**Assumptions:**

- Government implementing partners will remain committed to the project throughout the implementation period.
- Relevant government departments will facilitate the project’s access to national systems and existing infrastructures.
- Targeted schools and school staff will remain committed to the project throughout the implementation period.
- Multiple project areas will not be affected simultaneously by significant climate-related and non-climate disasters (e.g. flood, drought, heatwave etc.) during implementation.

**Project outcomes, outputs and activities**

**Outcome 1:** The education sector at national and sub-national levels in targeted countries is more resilient to the impact of climate change.

The BRACE project will support schools and communities to become better equipped to handle the impacts of climate change. This means national policies are in place and operational, resources are directed to building and retrofitting climate resilient schools, and learners, teachers, and school management are trained in climate adaptation practices. School communities are also involved in protecting schools and the children within them and finding alternative learning spaces during emergencies. Ultimately, the education sector is expected to become more resilient, ensuring all children, including marginalized groups, can continue learning with minimal interruptions from floods, drought, or extreme temperatures.

**Output 1.1: Enabling systems and policies are in place and supported**

The BRACE project will ensure that robust systems and supportive policies are established and actively maintained to facilitate effective climate change adaptation and resilience within the education sector. By creating a conducive policy environment and strengthening institutional frameworks, this output aims to enhance coordination, policy implementation, and capacity building at various levels, ensuring sustainable and resilient education systems. This includes establishing key focal points at both national and sub-national levels to link ministries responsible for CCA and DRR, to those responsible for education at all levels.

As a result, the foundations for the project are built at national and sub-national levels, building on the work conducted under the ‘Climate Smart Education Systems Initiative – CSESI’ project to provide scoping and foundations for crucial policy updates. When creating and validating new policies or strategies under this output, the core task team will also ensure to learn from previous and ongoing

related projects in South Sudan. These include: the ‘Multi-year resilience program’, funded by ‘Education cannot Wait (ECW)’ and previous Global Partnership for Education (GPE) programmes including the ‘Education Sector Plan Implementation Grant – ESPIG’. Results from such programmes will be incorporated by carefully reviewing the project documents – evaluation results and project reports – and by consulting with stakeholders directly involved, to create new policies and guidelines.

**Activity 1.1.1: Facilitate preparation and endorsement of climate and education policies, plans, and guidelines**

This activity will prepare climate change and education policies, plans, and implementation guidelines for climate change adaptation. It involves a comprehensive review of existing policies and strategies relating to climate change, taking lessons from different ministries within South Sudan and best practices from other countries, especially neighbouring countries such as Uganda, Ethiopia, and Kenya which have overlapping climate contexts. Participants involved in previous relevant projects will also be consulted to help develop such policies. Additionally, a comprehensive assessment will be carried out at national, state, and sub-state level to understand the needs of people impacted by the policies and strategies. The needs assessment will explicitly consider the gendered impacts of climate change and impacts upon other marginalised groups such as children, people with disabilities, displaced people, and ethnic minorities. The needs assessment will also be used to glean further information for other related project activities. The consultations will guide results under 1.1.2 by assessing climate change coordination mechanisms at sub-national levels, and the ‘education in emergencies’ minimum standards.

As part of the consultations, this activity also links to **activities under output 1.3**, which will consider effective messaging for EWS within the education sector. The messaging developed under 1.3 will be described in the climate change and education policy, and materials with clear messaging will be created at national level, to further distribute among states and counties not included under the BRACE project.

Once consultations have been completed, a core team from the project implementation unit, MoGEI, and one or two other relevant ministries such as the Ministry of Environment and Forestry and the Ministry of Humanitarian Affairs will review the summary findings and work together over an extended period to draft the new policy. The new policy will be shared with a wider group and presented in a validation meeting and revised accordingly. This will finally be validated by the Ministry for Education and be passed as a new official strategy. Implementation guidelines will be produced.

These activities will revise and enhance the existing INEE Minimum Standards for South Sudan to incorporate benchmarks and standards that ensure educational environments are climate-resilient and environmentally sustainable. There will be particular focus on DRR and EWS, and the gendered impact of emergencies as evidence states that young girls fare far worse under natural hazards than other groups (see **annex 8: GESI action plan** for more information). The update will also ensure that differential impacts on other marginalised groups are clearly stated.

The INEE standards will be closely linked to the climate and education strategy developed under 1.1.1, and knowledge generated under 1.1.1 will feed into emergency standards. Furthermore, the messaging and techniques developed for DRR and EWS related to education, will be incorporated into the minimum standards.

The activity will involve a task team including the South Sudan Education Cluster (SSEC) to oversee the process, which will most likely be an extension of the task team conducting the review of policies under **activity 1.1.1**.

The needs assessment budgeted under **activity 1.1.1** will also incorporate learnings about education in emergencies policies. Findings from this assessment related to the climate-relevance of current standards will be used to update and revise the standards. Following the update by the core task team, stakeholders will come together to validate the updates, and the report will be revised again if necessary and finalised, including validation by the Ministry for Education. Validation and meetings will be closely coordinated with the broader climate and education policy created under **activity 1.1.1** to ensure efficiency and alignment of strategies and standards.

Finally, the updated standards will be printed physically and distributed to all states and counties across the country.

**Sub-activities:**

1.1.1.1.b Conduct review of existing policies on climate change with different ministries, including policies on climate and education in different countries.

1.1.1.2.b Conduct needs assessment with key stakeholders including children at national, state and county levels about current implementation of policies and climate change impacts on education, delivering summary report with recommendations.

1.1.1.3.b Disseminate findings of review and needs assessment including EiE needs assessments to relevant line ministries at national level, and conduct meetings to devise strategy, ensuring gender mainstreaming and needs of the most vulnerable are considered throughout.

1.1.1.4.b Based on strategy meetings, SCI and MoGEI finalize write-up of strategy, ensuring critical section for climate-related gender and social inclusion considerations.

1.1.1.5.b Hold short final validation meeting with ministries and children to endorse new strategy.

1.1.1.6.b Present strategy to Minister of Education for finalization and endorsement through the Government of South Sudan.

1.1.1.7.b Incorporate messaging and strategies developed for DRR under output 1.3 into the education and climate policy.

1.1.1.8.b: Update the Inter-Agency Network for Education in Emergencies (INEE) Minimum Standards (MS) for South Sudan by nominating a task team made up of MoGEI and the SSEC to lead the updating process.

1.1.1.9.b: Building on the assessment conducted in 1.1.1.2.b, consult with teachers, children and parents in vulnerable areas to understand current practices regarding EiE.

1.1.1.10.b: Prepare a report with recommendations for INEE MS.

1.1.1.11.b: Conduct meetings at national and state levels to discuss findings and agree on actions for updating the INEE minimum standards.

**1.1.1.12.b:** Submit the revised minimum standards to relevant stakeholders at all levels, including the Payam education office.

**Activity 1.1.2: Strengthen coordination on climate change within MoGEI and other relevant line ministries at national and sub-national level**

**Description:** Enhance collaborative efforts between the MoGEI and other relevant ministries at both national and state levels to effectively address climate change issues in the education sector.

Under **CSESI (activity 2)**, there will be a scoping study to review coordination mechanisms between different line ministries relating to education and climate change. This activity builds on the findings of that study and will include work at sub-national levels to further assess the impacts (part of the same assessment budgeted under activity 1.1.1.1.b).

In addition to the report presented describing national-level consultations under CSESI activity 2, a further report will be created based on the findings of the sub-national level consultations, including recommendations for focal points at state, and if possible, county and payam level (second lowest level of administration). The project will build on the scoping study under CSESI by working closely with the MoGEI, and the MoEF, to develop a ToR for an education / climate change focal point at national level. The project team along with the two national ministries will support with the recruitment process. However, the BRACE project will not budget for this position. The position will ensure dedicated resources are in place to oversee the implementation of the climate / education policy, and ensure other interventions included in this project are maintained.

The project team along with MoGEI at sub-national level, will appoint focal points representing government officials in states and counties as part of this activity. These focal points will be key to organise the training under **output 1.3** in particular, as well as supporting facilitation of county-level teacher training under **output 1.4**. This activity will also provide recommendations on appointing focal points at school-level to manage DRR and EWS processes. The recommendations will ensure that those involved are part of existing structures at school and community levels, such as environment clubs (children), Parent Teacher Associations (PTAs) and School Management Committees (SMCs) or in wider community groups – especially religious groups – at the community level. The focal points at school and community level will be appointed under **output 1.3**, as well as training and planning with these focal points.

**Sub-activities:**

- 1.1.2.1.b Using the assessment under 1.1.1, consult with stakeholders at sub-national level to understand coordination at state, county and community levels
- 1.1.2.2.b Based on findings of assessment, develop report on sub-national coordination
- 1.1.2.3.b Work with MoGEI to establish national focal point for climate and education
- 1.1.2.4.b Conduct inter-agency follow up meetings (with different regularity at national, state, county and payam level) with agreed action points and monitoring of BRACE implementation plan.
- 1.1.2.5.b Establish focal points at the national level and in targeted states and counties, including child focal points at schools, supported by religious and community leaders, linked to school environment clubs (output 1.4).

**Activity 1.1.3: Facilitate integration of DRR into existing and/or new plans with education authorities.**

**Description:** This activity will support the preparation of inclusive Emergency Preparedness Plans (EPP) and contingency plans for states and counties targeted by the BRACE project. The EPP will be gender and disability-inclusive, and through consultations the project will involve women's rights organisations as well as disability organisations at state and county levels. Through this activity, officials in the MoGEI will also be trained on the new education in emergencies minimum standards developed under activity 1.1.1.

The EPPs are designed to allow state level officials to have a full, detailed description of all the hazards and risks in their states, as well as appointing key personnel and operating procedures

This activity links strongly to the ongoing Multi-Year Resilience Program (MYRP), with MoGEI and MoEF officials having created national level EPPs in June-July 2024 for all of South Sudan. This activity builds on the work already conducted to develop the plans. National-level stakeholders who have created plans will be involved in the facilitation of state-level plans and work through state-level officials.

**Sub-activities and descriptions:**

1.1.3.1.b: Provide training sessions for state and county officials established under 1.1.2 on emergency preparedness and contingency planning.

1.1.3.2.b: Perform state-level hazard vulnerability assessments to identify areas of risk.

1.1.3.3.b: Support the development of participatory emergency preparedness and contingency plans with state-level officials.

1.1.3.4.b: Test contingency plan with simulations at national and state level, working with all key ministries.

1.1.3.5.b: Refresher training and simulation on contingency plan.

1.1.3.6.b: Enhance the capacity of National MoGEI and State MoGEI county officials on INEE MS.

**Activity 1.1.4: Support children to participate in climate change and education policy initiatives.**

**Description:** Child-inclusive leadership and participation on climate resilience in the education sector. This activity empowers South Sudanese children to influence climate resilience policies within the education sector. Through workshops at national and state levels, children will engage with government officials to share their perspectives and recommend best practices. Key child parliament members will champion climate change integration into broader policies, ensuring children's voices are included in policy development.

The project will facilitate regular meetings between children and government officials and monitor the results. Children from the environment clubs formed under output 1.4 will be invited to participate in state-level consultations

**Sub-activities and descriptions:**

1.1.4.1.b Conduct workshop / event at national level with children (girls and boys) and government officials to allow children (girls and boys) to influence policies and best practices of MoGEI. MoGEI to take up actions as recommended by the children.

1.1.4.2.b Conduct workshops at state level with children and government officials to allow children to influence best practices and policies of MoGEI.

1.1.4.3.b Identify key stakeholders within existing child parliaments to champion the integration of climate change impacts into wider government policy.

1.1.4.4.b Follow up monitoring of children's inputs into policy.

**Output 1.2: (CSSF Pillar 1) School facilities are safer and greener.**

The South Sudan Basic School Construction Standards and Guidelines were developed in 2016 by the Department of Physical Planning and Construction in the MoGEI. The standards and guidelines ensure school infrastructure adheres to minimum standards for child-friendly and safe learning spaces. The Education Sector Plan 2023 puts forward several measures for climate-resilient infrastructure. These include the incorporation of climate-responsive standards to ensure that all new schools are hazard-resilient.

Under the GPE-funded Climate Smart Education Systems Initiative (CSESI), a light review of the current school building standards in South Sudan will be conducted to identify opportunities to strengthen the incorporation of climate change and environmental priorities. The climate resilient school building standards will be applied within schools targeted by the BRACE project on a case-by-case basis to fortify them to withstand extreme weather events such as floods, heat waves, and strong winds. BRACE will not implement the same set of activities in each school, and rather conduct a comprehensive safety assessment of target schools, selecting specific interventions accordingly.

Activities under this output directly address some of the main climate drivers in South Sudan, that result in schools being closed regularly due to flooding or heatwaves, and children left with no alternatives. Improving school buildings, WASH facilities, and providing natural protection and alternative sources of nutrition through green schools will provide more children with safer spaces should disaster occur. Improving WASH facilities will directly improve some of the worse health outcomes related to drought and flooding, and planting trees that produce climate-appropriate food can provide an alternative source of sustenance for children (and their wider families) in the case of unsuccessful harvest.

Infrastructure and WASH interventions may include:

- Natural ventilation for better air circulation and rainwater harvesting systems for water conservation
- Enhanced green infrastructure and planting of local shade trees within and around school grounds, reducing heat and improving air quality
- Adopting energy-efficient water pumping systems on existing water-points
- Exploring the use of renewable energy sources like solar power to run lights and charge devices in the evenings, allowing for extended learning hours. This will be particularly beneficial in areas with good internet connectivity, as teachers and students can access early warning information on digital devices
- Installing rainwater harvesting facilities in some selected schools
- Improving solid waste management practices will be encouraged.

This list presents possible interventions. **At a school-level, selected interventions will be implemented based on specific climate risks and vulnerability.** The choice of schools for infrastructure improvements will be done in close partnership with state and county-level government to assess needs, alongside the difficult operational context in South Sudan. The functionality of school committees (PTAs/SMCs) will also be a factor in the selection, and schools with well-functioning and dedicated governance structures will be prioritised in order to promote sustainability. However, to ensure the most vulnerable schools with weaker governance structures are not unfairly excluded, other considerations will also be taken into account.

Similarly, internet connectivity in schools will not be pre-determined criteria. The project will intervene in a wide range of schools both to test the approach in different contexts, and to ensure fairness among beneficiary selection.

The project will aim to implement infrastructure and WASH improvements in 30 schools across six counties, with an estimated 31,514 direct beneficiaries (including community members) and implement green school initiatives in 75 schools across 6 counties, with an estimated 26,076 direct beneficiaries.

### **Activity 1.2.2: Retrofit school facilities, including WASH and internet connectivity, to strengthen climate resilience**

This activity will conduct thorough assessments of WASH facilities and overall infrastructure in schools, followed by the creation of tailored improvement plans aimed at enhancing climate resilience and incorporating gender sensitivity and accessibility for people with disabilities.

The assessments will be conducted by a combination of a lead consultancy, the core project team (especially engineering and WASH technical experts), the engineering team from the MoGEI, and partner staff. The assessment will be comprehensive, including water testing, investigating building foundations, consulting with school staff and parents about particular hazards, and other suitable measures. Additionally, the assessment team will consult with school stakeholders on trees, plants, and crops in the vicinity to support **activity 1.2.3**.

The thoroughness of the assessment – and involvement of school stakeholders – ensures that the interventions selected for each school will be tailored to the context and aim to maximise sustainability. A core part of the assessment will also be to investigate how safe the school facilities are for the most vulnerable groups, including girls, and people with disabilities. Following the assessment, the consultant supported by the project team will provide school-level improvement plans, tailored to each school and utilising the budget allocations available.

These plans will then be presented for feedback at each of the 30 schools, incorporating county and payam officials with opportunities to comment. The project staff will explain the upcoming interventions, and in some cases, the interventions may be deemed to be unsuitable for reasons missed by the technical team, so the plans may be revised.

Based on the findings of school infrastructure assessments, the retrofit and rehabilitation of school infrastructure including WASH infrastructure will be undertaken.

In line with the interventions outlined in output 1.2 description (above), the project team will source suitable firms and professionals to implement the school improvement plans. Based on SCA's experience working in South Sudan, this is likely to be a combination of several firms, with experience implementing similar infrastructure and / or WASH improvements in the target states and counties. Save the Children will oversee the tender process, but partners at county level will be tasked with managing the day-to-day workings of the improvements, supported by technical engineering and WASH expertise provided by Save the Children.

The project staff – roving project engineer and WASH specialist particularly, as well as county-based officers – will oversee the improvements conducted by the contractor(s) in each county. As part of the assessments and based on the detailed school-level improvement plans, attention will be paid to improving both WASH facilities and broader infrastructure to be more accessible to people with disabilities, and safer for girls.

The contracting process will be fully determined under project implementation (see **Annex 10: procurement plan** for more information). If the context allows, and for simple interventions, the lead contractors will be encouraged to use local labour and materials easily accessible from close to the schools and communities. Additionally, Invitation to Tenders for contractors will include requirements to build knowledge or capacity – where possible and appropriate – at the school and community level, on both operations and maintenance, and construction of simple interventions.



The improvements will address the specific needs identified during the assessments and ensure to be aligned with ‘green’ improvements under the green model school initiatives from the CSESI project, implemented under **activity 1.2.3 below**. The work will be completed while ensuring that the infrastructure remains within Category C, which pertains to low-risk projects under Save the Children’s guidelines. However, it is envisaged that improvements and measures will include:

- Upgrading boreholes to be disability-friendly
- Installing hand pumps at boreholes
- Rehabilitating existing solar installations and installing new solar reticulation at boreholes
- Rehabilitating existing and constructing new rainwater harvesting systems at schools where appropriate
- Ensuring latrines are flood resistant, gender-sensitive and accessible for people with disabilities, and rehabilitating existing gender measures on latrines where necessary
- Building-specific improvements to improve heat reduction, e.g. improved ventilation and shading
- Flood reduction measures, e.g. fencing, culverts

Under this activity, the most practical elements of the Green School Initiatives will be embedded into the regular operations of schools, fostering a culture of environmental awareness and sustainability. The project will integrate Green School Initiatives into existing school systems by facilitating planting trees and traditional and drought-resistant plants, providing schools with agricultural tools and suitable seeds for gardens, and installing small-scale water-efficient irrigation systems. The goal is for the students to learn about how to mitigate the risks of floods, heatwaves (as well as practically mitigating the risks themselves), and droughts while promoting environmental education through student-run green school initiatives.

While the final precise guidelines for implementing Green Schools will be provided by the CSESI (model green school initiatives), it is expected that there will be some key steps for the children and their supervisors (PTA’s / SMC’s or teachers, depending on the school context and those engaged under **activity 1.3.1**).

Children will be provided with seeds appropriate to their arable land, which will be assessed using both primary and secondary sources. Primary sources include the infrastructure assessment under **1.2.1**, which will also determine existing crops, trees and other plants around the school areas, and secondary data sources include state and county-level staff at the MoEF to validate seed and seedling selections. Once suitable plants have been selected for the target schools, children will plant trees through environment and DRR clubs. Trees will be drought resistant, and both fruit- and non-fruit bearing. This creates a green buffer around a school which can help to mitigate the worst impacts of climate events such as floods, heatwaves, and drought. By including both fruit- and non-fruit-bearing trees, schools will promote environmental sustainability while also providing nutritional benefits.

Related to this, the activity will provide agricultural tools, and drought resilient seeds (different to the trees) for small-scale school kitchen gardens. Children will be involved in looking after the gardens, which teaches them valuable agricultural skills, and directly provides an alternative source of food should climate change impact the wider yield.

Finally, green school initiatives will promote the provision and installation of small-scale water-efficient irrigation systems to support school gardens within the confines of SCA’s category C rating. These systems are crucial for ensuring the sustainability of garden projects, especially in areas prone to water scarcity. By incorporating water-efficient technologies, schools can maintain productive gardens with

minimal water use, thus supporting the efforts of DRR and environment clubs in promoting climate-resilient agricultural practices. Given the potential for community members outside of school settings to embark on water use and irrigation practices, the project will place a strong emphasis on promoting learning and sound practices for school staff and wider community members.

**Sub-activities:**

1.2.2.1.b: Conduct school infrastructure assessments which consider physical and psychological safety for children - including existing WASH infrastructure and water testing - of each target school using MoGEI existing guidelines and the recommendations prepared as part of the CSESI project, with a focus on integrating climate change considerations.

1.2.2.2.b: Based on assessments, create an inclusive school-specific infrastructure improvement plan including inputs to procure and construct for each school, within Save the Children's accredited risk category.

1.2.2.3.b: Validate improvement plans at both national and school level (incorporating county and payam officials where appropriate).

1.2.2.4.b: Based on a plan created under 1.2.2.3.b, source and procure relevant items and equipment for school infrastructure improvements.

1.2.2.5.b: Conduct school infrastructure improvements including WASH facilities retrofit/rehabilitation at each target school, responding to needs identified under assessment and aligning with the green model schools' initiatives conducted under the CSESI project, ensuring that infrastructure remains within Category C.

1.2.2.6.b: Plant trees and drought-resistant plants (both fruit-bearing and non-fruit-bearing) to mitigate the risks of floods, heatwaves, and droughts. Promote hygiene in schools located in flood and drought-prone areas to prevent outbreaks of water and vector-related diseases during and after floods.

1.2.2.7.b: Provide agricultural tools and drought resilient seeds for school gardens.

1.2.2.8.b: Supply and install water-efficient irrigation systems in support for school gardens initiatives run by DRR/environment clubs.

**Activity 1.2.3 Strengthen school communities and education officials to operate and maintain school infrastructure and facilities**

Description: Focal points within existing school structures or committees – likely 1-2 per school – will be appointed to oversee operations and maintenance of WASH and infrastructure once the implementation is finished. Project engineering staff and partners will conduct regular monitoring throughout the project lifecycle. The project will also aim to connect school and community members to existing options for repair of equipment within an attainable distance. This is not always possible in South Sudan, and in such cases, county officials particularly those already trained in DRR and CCA **under output 1.3** – will be a focal point to report to.

Finally, MoGEI and MoEF officials will conduct joint monitoring and supervision<sup>271</sup> of the infrastructure throughout the project lifecycle, enhancing capacity of these officials and building understand of how 'climate-resilient WASH/infrastructure' is positively impacting schools. This will also involve discussing the impact of the interventions with children.

**Sub-activities**

1.2.3.1.b: Appoint focal points within existing school structures to be responsible for overseeing operations and maintenance.

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<sup>271</sup> In this case, joint monitoring and supervision refers to government officials visiting schools with Save the Children and / or partner staff, and assessing the effectiveness of the new infrastructure as well as connecting with relevant focal point to listen to reports of misuse)

1.2.3.2.b: Joint monitoring and supervision of new infrastructure between project staff and officials throughout project lifecycle.

**Output 1.3: (CSSF pillar 2) School safety and educational continuity management systems are operating effectively.**

This output involves provision of basic DRR/CCA training to teachers and PTAs/SMCs so they can sustain the project initiatives, ensure disaster preparedness plans outline evacuation procedures, stockpile essential supplies, and put in place communication protocols. Training on green school initiatives are included, which provides the foundation for the implementation of the initiatives under output 1.2. The training will also include a focus on rapid alerts to impending disasters, such as extreme flooding, winds, or rapid-onset heatwaves, and support schools to develop response plans and hazard assessments of their own surroundings. The green school initiative links closely to DRR and CCA training. Implementation will provide key responses and measures to help the school adapt to natural disasters and a changing climate, such as through trees for shade and natural barriers against excess flooding.

Training will be provided by county-level officials to schools through a Training of Trainers (ToT) model, ensuring the project builds up skills and knowledge on DRR and EWS through the education system from top to bottom. The act of providing training for school-level stakeholders will embed knowledge in county officials and ensure they are ready to act effectively in the face of a disaster. State and county officials will create sub-national-level emergency preparedness plans and test them through simulations.

Communities will be involved in establishing EWS. Mental health and psychosocial support, child protection, and post-disaster recovery plans are also included, creating a more resilient education system that allows children's learning to be less disrupted by extreme weather events.

This output builds on the initial work that will be undertaken under the CSESI project (particularly CSESI 6.2). Under CSESI, the initial scoping and identification of specific roles and responsibilities will be completed. BRACE will ensure these roles are suitable by testing them in different settings, if necessary adjusting based on local context, then rolling out widely across project communities and schools. The work conducted under BRACE, including the risk assessments, emergency planning and improvement plans will be at school level, as opposed to the foundational work under CSESI which will be at a national planning level.

**Activity 1.3.1: Build capacity of national and sub-national education officials to be master trainers on climate-related school safety**

**Description:** BRACE will strengthen the capacity of education officials to act as master trainers in the delivery of climate-related school safety in target schools. The training will be delivered through a ToT approach. Master trainers at the state level will provide training at county level, and county-level education officials will train school staff, in partnership with relevant officials from the MoEF and project staff. Delivering training through a ToT model ensures sustainability with knowledge embedded in government structures.

**Sub-Activity**

**1.3.1.1.b** Train master trainers at state level, who then train county-level officials to deliver training at schools.

### **Activity 1.3.2: Build knowledge and capacity of school management, teachers and children to prepare climate-related school safety plans**

**Description:** PTA/SMCs and teachers will be trained on DRR and CCA, including green school initiatives. The training package will be a comprehensive, climate-resilience training, and the training participants at school-level will be a combination of teachers, parent-teacher associations, and school management committees, with the most suitable participants determined on a school-by-school basis. In some schools, the PTAs will be the most suitable recipients, whereas in some cases it is more appropriate for teachers to receive training, with both groups eligible for training if they are functioning. The wider community will also be involved in the training, as key community stakeholders such as traditional and religious leaders are crucial in facilitating community-based response mechanisms.

#### **Sub-activity**

1.3.2.1.b: County-level officials provide training on DRR/CCA and green school initiatives for PTAs, SMCs, and teachers.

### **Activity 1.3.3: Implement school-level climate-related school safety plans**

**Description:** After the training conducted in activity 1.3.2, target schools will be supported to conduct a comprehensive risk assessment and mapping of their school. The mapping will identify specific risks and hazards that schools face, enabling the development of targeted strategies and interventions to mitigate these risks and enhance the safety and resilience of the school environment. In addition to the risk assessment, schools will come up with a climate resilience action plan, including practicing drills, Standard Operating Procedures (SOPs) for future emergencies relevant to their context. These plans will include a specific standard operating procedure for child protection cases, with case management referrals or safe reunification procedures put in place.

Throughout consultations, the project will work with representatives from organizations for women and people with disabilities. This activity builds on CSEI activity 6.1, as it will help to roll out some of the key messages developed at national level under CSEI into target schools under BRACE.

Finally, the activity will organise community outreach programmes aimed at raising awareness about climate change, DRR and EWS. These programmes will engage community members, including parents, local leaders, and students, to build a collective understanding and foster a culture of preparedness and resilience within the community.

#### **Sub-Activities**

1.3.3.1.b: Conduct mapping of schools' risks associated with schools in vulnerable areas.

1.3.3.2.b: Develop school-level resilience action plan.

1.3.3.3.b: Carry out community outreach programs to raise awareness on the plans.

### **Activity 1.3.4: Provide climate resilience tools, equipment and kits to schools**

**Description:** The individual target schools will also be provided with the necessary tools and materials to the DRR/CCA committees within schools. These resources will support the committees in carrying out their activities and initiatives, ensuring they are well-prepared to manage and respond to climate-related risks. Tools may include items such as buckets and sand for fire, whistles, torches, first aid kits, and communication equipment where appropriate.

### **Sub-Activity**

**1.3.4.1.b:** Supply DRR / CCA tools and materials for school committees formed under 1.3.2.

### **Activity 1.3.5: Strengthen access to and use of Early Warning Systems (EWS) and Climate Information Systems (CIS) in schools**

**Description:** Support schools to have inclusive access to real time information on early warning and climate change. The project will leverage a comprehensive EWS, integrating both locally sourced knowledge and scientific data from South Sudan meteorological services, IGAD Climate Prediction and Applications Centre (ICPAC), and the National Multi-hazard Early Warning Technical Working Group under the Ministry of Humanitarian Affairs and Disaster Management (MoHADM). To enhance monitoring of extreme weather events like floods and droughts, the project will collaborate with relevant line ministries such as the Ministry of Water Resources and Irrigation (MoWRI) and the MoEF, which are crucial for sharing alerts on heatwave risks. Recognizing the internet connectivity limitations across South Sudan, the project will prioritize existing communication channels. By employing school-level DRR committees, the project will effectively disseminate early warning information on various risks, safeguarding both children and communities. Information flows from national level (Met office and MoHADM, through MoGEI), to state and county level. Focal points established under **activity 1.1.2** (working for MoGEI at state and county level) will be responsible for ensuring the existing structures and systems are linked to MoGEI, who will then disseminate to the PTAs / SMCs trained under 1.3.2 at school community level.

Schools in each target county will be formed into clusters, based on proximity and ease of communication; the precise number of schools in each cluster will depend on each county and geographical context. These clusters will each have EWS focal points and the project will facilitate communication between schools within the network to ensure effective responses to disasters.

#### **Sub-Activities:**

1.3.5.1.b: Establish and maintain a school-based early warning network system by organizing schools into clusters.

1.3.5.2.b: Disseminate early warning information via multiple channels such as SMS, radio stations, and broadcasts.

1.3.5.3.b: Ongoing joint monitoring and supervision to assess effective use of early warning materials.

### **Output 1.4: (CSSF Pillar 3) Climate change resilience teaching and learning embedded in national systems**

The South Sudan National Curriculum Framework features environmental awareness and sustainability as cross-cutting issues to be integrated across all subjects (MOGEI, NCF), and Nationally Determined Contribution (NDC) (2021) references education and training for green economy (MOEF,2021). However, South Sudan does not have a guideline on integrating climate change into curricula, and there is currently limited content on climate change included in the primary (social studies) and the secondary (geography) curricula. Similarly, there are currently no specific teaching materials on DRM and climate change competencies for teachers.

Under the GPE-funded Climate Smart Education Systems Initiative (CSESI), MoGEI with the support of UNESCO will identify a set of priority topics and learning outcomes on climate and the environment from the Greening Curriculum Guidance, in consideration of local knowledge, learning assessment. UNESCO will also conduct a review of subject level curriculum and sampled non-formal programmes for early childhood, primary, and secondary level on climate and the environment related topics and

learning outcomes. Based on this analysis, a set of standard learning materials on priority topics and learning outcomes will be developed/updated that are adaptable through formal, non-formal, and informal education. To complement the learning materials, a training manual for teachers and educators, based on priority topics and learning outcomes identified, will be developed. The key stakeholders engaged will include MoGEI officials including master trainers at national and sub-national level, representatives of school management, teachers, teacher training institutions as well as civil society organizations.

The BRACE project will support MoGEI in rolling out the use of the new climate education learning and teaching materials as part of implementation of the new basic education curriculum and Teacher Professional Development (TPD) nationwide. This output's overall intention is to support education systems to integrate risk reduction and resilience education. This means teaching students about natural hazards, how to stay safe during emergencies, and how to build a more resilient future. This education will be embedded throughout the curriculum, as well as through non-formal education and not as a separate subject, ensuring students gain the knowledge and skills they need to navigate and adapt to potential threats.

#### **Activity 1.4.1: Develop teaching and learning materials on climate change ready to implement through national, non-formal, and informal curriculum**

**Description:** Development of quality climate change, risk reduction, and environmental learning materials for children. This activity will develop and distribute culturally relevant educational materials on climate change, risk reduction, and environmental sustainability for children. By adapting the learning materials developed under CSEI with local input, the project ensures accessibility in different languages and contexts. The appropriate languages and materials will be selected for each county, and learning materials will be adapted with relevant images and content based on the prevailing climatic conditions at a county level.

A particular focus will be placed on considering mental health and psychosocial support for children within the learning materials. It will offer advice and guidance on how to access support mechanisms within the materials and is linked to **activity 1.4.5** which will disseminate the same information through media and advocacy. The information will be around the possible impacts of climate change on mental health, as well as how children can access support mechanisms in the aftermath of a climate-related disaster. The materials will be based on practical examples and learning from needs assessments conducted under **activity 1.1.1**, which will also assess current operating procedures and accessibility of support mechanisms for children in the face of natural disasters and other extreme weather events.

Materials will be distributed to schools and vulnerable communities through mobile units based in the target counties which the project will develop, ensuring broad access to essential climate education. This includes children in the alternative education systems (AES) and out-of-school children in pastoralist and other marginalised communities. The project will roll out and distribute materials to all schools in the target counties and will facilitate distribution to ensure the materials reach the intended audience. There is a strong potential for scalability and replicability with this activity, as the materials developed will be available at national level and the project team will work closely with MoGEI officials to ensure a high chance of the materials being distributed to further sites.

#### **Sub-activities and descriptions:**

1.4.1.1.b: Review learning materials created under CSEI and conduct initial testing of materials with key stakeholders.

1.4.1.2.b: Update materials if required and engage local illustrators and storytellers to adapt materials into content suitable for different tribes and languages.

1.4.1.3.b: Facilitate printing and distribution of materials to target states, counties, and schools, ensuring different versions are available for different audiences.

1.4.1.4.b: Develop mobile units to facilitate rollout of materials to the most vulnerable communities, including pastoralists and people with disabilities.

#### **Activity 1.4.2: Build knowledge and capacity of teachers and education managers to implement climate change lessons inside the classroom**

**Description:** Teacher and staff (education managers) professional development for both formal and non-formal education on climate change, risk reduction, and the environment using the training manual for teachers and educators developed under CSESI. This activity aims to enhance the skills of teachers and education managers in South Sudan by providing professional development on climate change, risk reduction, and environmental education. Using the CSESI training manual (**CSESI activity 7.2**), the programme will tailor content to meet the needs of diverse groups and ensure alignment with national educational initiatives. Training will be rolled out at various administrative levels with ongoing mentorship to support sustained learning and practical application. The implementation of professional development will also enable the project team and Ministry to improve training materials in future, feeding back into the initial process started under CSESI.

The training will be implemented by bringing teachers from all schools in the target counties together to receive training at a county-level, through a ToT approach. Training materials relating to climate change will be used to support the curriculum review process and training manual development.

##### **Sub-activities and descriptions:**

1.4.2.1.b: Conduct needs assessment and consultation on teacher training manual developed under CSESI with key actors at national and state level across formal and non-formal education to determine relevant training content.

1.4.2.2.b: Work with relevant bodies (e.g. higher institutions, other relevant line ministries, civil society, child representatives and education partners), to develop and validate training plan rollout for key actors, considering differing needs for different groups, e.g. pastoralists, women/men, girls/boys, PWDs etc.

1.4.2.3.b: Facilitate rollout of training at different levels (national, state, county, payam), ensuring training is aligned to World Bank 'Building skills for human development in South Sudan' programme.

1.4.2.4.b: Rollout training to schoolteachers and conduct ongoing teacher mentorship focused on climate change among target counties and schools.

#### **Activity 1.4.3: Strengthen capacity of child clubs to lead climate change initiatives in their school and community**

**Description:** Establish or strengthen environment clubs in schools with children to oversee and implement project initiatives. Throughout the project activities, there are several key interventions which school children will participate in and implement, including the green school initiatives, and participating in school risk mapping, and broader DRR measures under output 1.3. In many schools in South Sudan, school environment clubs already exist often through other projects that were implemented, but also in some cases through the school's own initiatives.

This activity will capitalise on experiences Save the Children have gained through the MYRP in South Sudan, successfully establishing environment clubs to encourage child participation in climate-resilient actions. Children in the environment clubs under BRACE will especially focus on green school initiatives where children will plant trees and take part in kitchen gardens at their school. The environment clubs will be closely linked to and overlapping with the DRR community committees established under 1.3.1,



with children who participate in environment clubs forming the child members of the DRR committees within their communities.

This will give children a sense of ownership over some of the initiatives and provide them with opportunities to input into strategies around DRR and green schools within the project, fostering a strong sense of inclusion and empowerment. The activity will work first through identifying whether there is any existing environment club or similarly-focused children's club, and if so, will ensure it is functioning well and has a clear strategy. If there is no environment, climate, or DRR club directly for children, the project will establish one, and link to the wider committees formed under 1.3. It will nominate one of the trained teachers under output 1.3 to facilitate the running of the club.

#### **Sub-activities:**

1.4.3.1.b Identify existing children's clubs at school-level and if no clubs exist, select suitable staff to facilitate running.

1.4.3.2.b Mobilise environment clubs at target schools including initial meetings and defining scope.

1.4.3.3.b Facilitate ongoing meetings of environment clubs and oversight of other project activities, especially 1.2.2 and 1.3.2.

1.4.3.4.b Facilitate and support environmental events and days.

1.4.3.5.b Train girls and focal point teachers on making menstrual hygiene management kits in schools.

#### **Activity 1.4.4: Disseminate climate change teaching and learning materials through MoGEI e-learning and other platforms**

**Description:** Informal (radio, media) education on climate resilience. This activity leverages informal education channels to raise awareness and change behaviours regarding climate resilience in South Sudan. By developing effective messaging through inclusive research, the project will create and disseminate educational materials such as radio jingles, leaflets, and television documentaries. PTAs and SMCs will be trained to use media tools for climate resilience, with ongoing monitoring to ensure effectiveness. Messaging developed will be informed by the Knowledge, Attitudes, and Practice (KAP) survey delivered under **CSESI (activity 6.1)** to best understand which type of messaging will be most effective.

The messaging will consider child protection topics to provide support and best practices for children who may experience anxiety after extreme weather events, linked to the guidance developed under **activity 1.4.2** for the children's materials.

#### **Sub-activities and descriptions:**

1.4.4.1.b: Based on research under CSESI, utilise messaging and materials to raise awareness on climate change and DRR key messages and family emergency plans; e.g., radio jingles, leaflets, advertising campaigns.

1.4.4.2.b: Create a television documentary to act as an educational video on climate change for students.

1.4.4.3.b: Facilitate rollout of documentary and other materials through SCI's Tech 4 development unit.

1.4.4.4.b: Ongoing joint monitoring and supervision to ensure messaging is understood and media techniques are utilized effectively.

#### **Activity 1.4.5: Prepare learning documents and hold events with MoGEI and other partners to share experience of integrating climate change into the curriculum**

**Description:** Prepare a learning document to advise on how climate change can be fully integrated in the next MoGEI curriculum review process. This activity will create a learning document to guide the integration of climate change education into South Sudan's national curriculum. By assessing current practices and materials, the project will provide strategic recommendations for enhancing climate education. An advocacy event will promote the findings, emphasizing the importance of embedding climate education in the curriculum to stakeholders and policymakers. Since the South Sudan curriculum has recently been revised, the BRACE project will not implement a full curriculum revision. When the next revision date is scheduled it will advise on the most suitable process for updating the curriculum to include climate change elements, as well as create material and content to input for the next review.

**Sub-Activities and Descriptions:**

1.4.5.1.b Conduct assessment of current best practices and materials related to climate change education in the curriculum.

1.4.5.2.b Based on assessment, create guidance document with recommendations for updating the curriculum.

1.4.5.3.b Conduct an advocacy event to promote the integration of climate change into the curriculum, showcasing best existing practices and presenting recommendations for the future.

### 3.5 Technical assessment of proposed activities

This section provides a technical assessment of a range of activities under the project, ensuring that the selected activities and implementation modalities are fit for the context and follow international best practice. All project activities also have strong government buy-in and are critical for sustainability.

#### 3.5.1 Climate change and education policy and implementation guidelines

South Sudan has ratified most of the international frameworks on climate change, and the South Sudan government has adopted several policies and plans to address climate change impacts and promote sustainable development<sup>272</sup> including:

- The National Adaptation Programme of Action (NAPA): Developed in 2016, this outlines priority adaptation projects in five sectors: environment, water resources, agriculture, disaster risk reduction, and policy and institutions. It aims to build capacity, raise awareness, and improve livelihoods of communities in the face of climate change.
- Nationally Determined Contributions (NDC): Updated in 2021, this identifies 14 sectors for both adaptation and mitigation strategies. It highlights agriculture, infrastructure, forestry, and disaster risk management as crucial areas. The NDC aligns with the Paris Agreement's goal of limiting global warming.
- Disaster Risk Management Strategic Plan: MHADM is responsible for disaster preparedness. Its strategic plan aligns with the Sendai Framework for reducing vulnerabilities and risks. It aims to address key challenges like developing a national disaster risk management policy and strengthening early warning systems.
- National Environment Policy: This focuses on protecting the environment and promoting sustainable resource use. While not publicly available, the NDC details its objectives, including establishing environmental regulations, integrating environmental concerns into development, and promoting public participation in conservation efforts. The policy recognizes climate change as a threat and advocates for mitigation and adaptation strategies.

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<sup>272</sup> Climate Smart Education Systems Strategic Capability Initiative. South Sudan. Inception report, December 2023

- Comprehensive Agricultural Master Plan (CAMP): This 2015 plan guides agricultural development across crops, livestock, fisheries, forestry, and institutional development. It aims for food security, improved livelihoods, and sustainable practices.
- Other Sectoral Policies: Climate change strategies are incorporated into various policies. The National Electricity Policy prioritizes a transition to sustainable energy. The National Biodiversity Strategy and Action Plan (NBSAP) recognizes climate change as a threat to biodiversity and emphasizes building resilience.

The South Sudan's General Education Policy (2017 – 2027) and the Education Sector Plan 2023 are policy documents with relatively comprehensive measures for climate change adaptation and environmental sustainability. However, there is still a gap in terms of an official national policy document or strategy to guide integration of climate change issues in the education sector. The BRACE project Output 1.1 will help fill this gap by supporting the development of a comprehensive policy and strategy with implementation guidelines that integrate climate change adaptation into the education sector, ensuring that schools and educational programmes are resilient to climate change impacts. The policy and strategy will use different international guidelines and frameworks and tailor contents of these to make a model that is operational for the particular context of South Sudan.

### 3.5.2 Strengthening coordination on climate change within the education ministry and with other line ministries

The South Sudan MoGEI Education Sector Analysis (ESA) 2023 report highlights that a lack of inter-ministerial coordination is increasing barriers to implementing effective DRR and CCA strategies in South Sudan. The ESA goes on to note that there appears to be a lack of coordination between MoGEI and other relevant line ministries such as the Ministry of Water and Irrigation, the Ministry of Environment and Forestry, as well as the Ministry of Humanitarian Affairs and Disaster Management. Furthermore, MoGEI does not currently have a focal point for climate change and the environment to lead on coordination and engagement with these other line ministries. The Education Cluster in South Sudan is under the leadership of MoGEI, and co-led by UNICEF, Save the Children, and Universal Network for Knowledge and Empowerment Agency (UNKEA). To de-centralize the coordination structure, State Clusters have been established in 10 states and two of the Administrative Areas.

The CSESI and BRACE projects will support in filling this gap in coordination on climate change within MoGEI and with different line ministries at national and state level. Under the GPE-funded Climate Smart Education Systems Initiative (CSESI), a scoping study will be conducted to outline the status of collaboration and coordination on climate and education. It will identify how to increase collaboration within MoGEI and with other line Ministries. A Terms of Reference for a climate change and education focal point responsible for coordinating climate change and DRR initiatives within MoGEI is also being prepared. The BRACE project will take this work forward to by facilitating dialogue at national, state, and county levels between relevant ministries and by establishing focal points at the national level and in targeted states and counties. This includes child focal points at schools, supported by religious and community leaders, and linked to school environment/ DRR clubs.

Save the Children already plays a significant role in supporting education coordination in South Sudan, serving as Co-lead with UNICEF for the Education Cluster and leading sub-clusters in some states. It actively participates in the Local Education Group (LEG) and contributes to the Research and Learning technical working group hosted by MoGEI. With experience in similar programmes across various countries, Save the Children collaborates closely with the South Sudanese government, particularly MoGEI, to implement education policies and the General Education Sector Plan. This

involvement extends to supporting the development of the GPE Partnership Compact and capacity building initiatives. With an extensive presence in South Sudan, including two implementing area offices and ten field offices, Save the Children ensures effective operational procedures, logistical support, and risk management.

### 3.5.3 Resilience retrofits for school infrastructure including WASH

According to the 2021 National Education Census, South Sudan has a total of 40,694 classrooms across all education institutions (Pre-primary to tertiary levels), 16% of which were closed due to natural disasters<sup>273</sup>. The South Sudan Basic School Construction Standards and Guidelines<sup>274</sup> were developed in 2016 by the Department of Physical Planning and Construction of the MoGEI, in partnership with UNICEF South Sudan Country Office, and with support from the GPE Programme and USAID. The standards and guidelines ensure school infrastructure adheres to minimum standards for child-friendly and safe learning spaces. The Education Sector Plan 2023 puts forward several measures for climate-resilient infrastructure. These include the incorporation of climate-responsive standards to ensure that all new schools are hazard-resilient.

- Under the GPE-funded CSESI, a light review of the current school building standards in South Sudan will be conducted to identify opportunities to strengthen the incorporation of climate change and environmental priorities.
- The climate resilient school building standards will be applied within BRACE-targeted schools on a case-by-case basis to fortify them to withstand extreme weather events such as floods, heat waves, and strong winds.
- BRACE will not implement the same set of activities in each school, instead conducting a comprehensive assessment of target schools and selecting specific interventions at school level.

Save the Children South Sudan has experience implementing climate-resilient WASH infrastructure, particularly recently through its 'GPE flood response' with \$10m of funding from the GPE implemented under the Multi-year-resilience project (MYRP) funded by Education Cannot Wait. This funding was provided to support schools adapt to the impact of flooding on education, and included:

- Construction of new classrooms with improved ventilation
- Rehabilitating and retrofitting latrines which had been damaged by flooding
- On the new classrooms, installing rainwater harvesting systems for potable water
- Installing solar-powered water pumps

Through stakeholder consultations in targeted flood response schools, the project design team found that hygiene had improved considerably and the water availability at school level increased significantly. Headteachers reported that the tanks were extremely effective in rainy season through times of floods, whereas regular boreholes often produced dirty or brackish water. Teachers reported that a 5,000-litre tank may last for around 20-30 days after the last rain, in a school with around 1,500 children.

Save the Children has decades of experience in construction work. All construction work will follow the **SCI Construction Policy and Standards** that are embedded in the local and international regulatory frameworks for Building Regulations informed by ISO-standards and local context. SC also uses the **SCI Environmental and Social Screening Tool** to identify and mitigate risks. Published in March 2024, the

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<sup>273</sup> National Education Census Report 2021. [Available here](#)

<sup>274</sup> South Sudan Basic School Construction Standards and guidelines. [Available here](#)

**UNESCO Green Schools Quality Standards** targets infrastructural work and this project will also be based on this. In summary, the project will ensure:

- That the construction projects meet acceptable local or internationally accepted standards for structural integrity- safety, public health and WASH
- Construction projects consider locally-assessed multiple hazards and incorporate hazard mitigation techniques in the design (against flooding, high winds, earthquakes, mudslides, heat, etc)
- Optimize site potential (orientation, sunlight, ventilation, shading)
- Community involvement to optimize operational and maintenance practices. Maintenance planning is considered early in the project cycle ensuring that community buy-in and ownership
- Local procurement of materials and labour where possible to reduce carbon emissions associated with long-distance transportation of materials and labour
- Use environmentally friendly solutions (green materials and techniques)
- Incorporation of local knowledge, and following local practice, making only moderate adaptations to ensure safety, disability access, and gender appropriateness.
- Minimize non-renewable energy consumption
- Protecting and conserving water (rain harvest systems inclusion in the building design)



**5,000-litre tank in primary school in Rumbek, Lakes State, South Sudan**

The global Greening Education Partnership (GEP)<sup>275</sup>, led by UNESCO, launched the green school quality standard in June 2024, which outlines a global target of greening at least 50% of schools in all countries by 2030. The green school quality standard was developed in collaboration across more than 450 organisations and provides a common language and agreed best practices for stakeholders to work towards creating climate-ready and green schools. Model green schools can facilitate the replication and scale up of good practices through:

- Demonstration and inspiration: Model green schools showcase best practices in action, serving as a source of inspiration for other schools. They demonstrate how sustainability can be embedded in school governance, operations, curriculum, and community interactions.

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<sup>275</sup> <https://www.unesco.org/en/articles/green-school-quality-standard-greening-every-learning-environment>

- Professional development and training: Model green schools provide training and professional development opportunities for educators from other schools. By sharing their expertise and experience, they help others to develop necessary skills for implementing green practices.
- Resource sharing: Resources developed and tested in the model green schools, such as teaching and learning materials, policy templates, and case studies, will be shared and can be adapted and applied by other schools.
- Networking: By creating a network of green schools, model institutions can facilitate the exchange of ideas and experiences. This network can act as a community of practice platform and as a support system for schools that are in the early stages of their green journey.
- Research and development: Model green schools will be centres for research and innovation, continuously exploring new ways to improve sustainability in education, and ideas and learning will be disseminated to a broader audience.
- Policy advocacy: Successful model green schools will influence policy by providing evidence of the benefits of green practices. This will influence replication and the adoption of supportive policies and increased funding for green initiatives in education.
- Community engagement: As hubs of sustainability within their communities, model green schools engage local stakeholders in sustainability efforts, creating a ripple effect that extends beyond the school itself.
- Monitoring and evaluation: Effective monitoring and evaluation strategies will be implemented to measure and document the impact of the green practices in the model green schools. These strategies will be shared with other schools to help them track progress and support of culture of data-driven decisions.

### 3.5.4 Strengthening SMCs and PTAs to lead school safety management and education continuity

School safety management should be done at different levels including the closest level to the risks as possible, which is the schools. Especially in contexts or remote areas where a school cannot count upon immediate support, the management of a disaster affecting the school community needs to be managed at the school community level. The BRACE project will work together with community members through SMCs and PTAs to build their capacity to lead school safety and educational continuity. This approach builds sustainability of the project long-term with communities themselves building their skills for disaster preparedness, outlining evacuation procedures, stockpiling essential supplies, and ensuring communication protocols are in place.

Working in partnership with communities, parents, and children is one of the building blocks of Save the Children's education programming, as outlined in the SCI's global Quality Learning Framework (QLF)<sup>276</sup>. Communities exercise their agency over decisions that affect the quality of children's education, including through participation in school/learning space governance structures (e.g., Student Management Committees/Student Councils, School or Centre Management Committees, School Safety Committees, and PTAs). Risk and capacity mapping takes place, and school/learning spaces improvement plans are developed, budgeted for, and implemented. Save the Children has good experience from this in South Sudan, for example from the Norad programme (2019-2023) where, as a result of a risk assessment, dykes were built around a school to prevent water flooding into classrooms. This enabled learning to continue as usual. Children and parents/caregivers are supported to organize, explore, plan, and act together to implement improvement plans.

Save the Children's years of experience shows that the most appropriate approach is an all-hazards risk assessment, although climate change impacts may have a special focus. In this way, protection and conflict risk are also addressed, for example gender-based violence and occupation of schools by

<sup>276</sup> <https://resourcecentre.savethechildren.net/document/quality-learning-framework/>



armed groups. Risk mitigation plans typically consist of infrastructural, organisational, and relational measures. This can be repairs to damaged buildings, creating dykes, developing emergency plans that include plans for educational continuity in case of a crisis, DRR trainings, walking groups to school, development of code of conduct for teachers to decrease protection risks, and more.

SCI's approach involves communities to be proactive rather than reactive in DRR and anticipatory action, to save lives and reduce the impact of hazards on education infrastructure, education personnel, learners, and their communities. Anticipatory action helps meet children's right to uninterrupted learning. Evidence shows the cost of responding to crises is far higher than the cost of being prepared. There is also growing evidence that as well as saving lives, anticipatory action saves money and mitigates the economic, political, social, and security impacts of compounded crises<sup>277</sup>.

Much of the evidence on effective school disaster management comes from Asia and the Pacific. However, Save the Children has relevant experience and good examples from South Sudan. Here, Save the Children is building SMCs and PTAs capacity to lead school safety management and education disaster preparedness and anticipatory action in several projects.

The MYRP (2023-2026) in South Sudan is a \$75 million initiative, with \$50 million jointly funded by ECW and the GPE. This programme is designed to meet the urgent educational needs of children and youth affected by conflict and displacement. Implemented by Save the Children in partnership with various stakeholders, the MYRP aims to improve access to quality education, enhance learning outcomes, and foster resilience within vulnerable communities. Both the current Phase 2 of MYRP, as well as MYRP Phase 1 (2020-2023), include capacity building activities of SMC/PTA and teachers on DRR/CCA risk mapping and assessment, and school safety preparedness and contingency planning. The MYRP has increased access to education for conflict-affected and displaced children, including those living in remote and hard-to-reach areas reaching a total of 119,463 children, 53.5% (63,925) boys and 46.5% (55,538) girls including 1,417 children with disabilities (669 females and 748 males).

Strengthened community engagement and ownership of education initiatives has been key in delivery of results and is leading to greater sustainability and resilience of vulnerable communities. The NORAD-funded education programme (2019-2023) in South Sudan, implemented by Save the Children, increased access to education for vulnerable children and youth in conflict-affected areas by enrolling and retaining 28,084 learners including 11,472 girls and 240 learners with disabilities, supported by 691 teachers. Community engagement was key in fostering sustainability and resilience, with 81% (508) out of 631 learners surveyed expressed feeling well and secure within their schools<sup>278</sup>.

An evaluation<sup>279</sup> conducted of a locally-led anticipatory action project in Maban County, South Sudan in 2023, funded by DANIDA through Save the Children Denmark. The study used qualitative data collection methods such as key informant interviews and focus group discussions with project stakeholders in a participatory manner with the objective of understanding the impact of the project. Maban county is prone to annual floods since the heaviest flood in South Sudan in 2020. The project built on existing local capacities, knowledge, and practices, adding technical expertise and support via community structures. The main activities included community-led awareness and risk communication, child-led anticipatory action for flooding through DRR clubs, and community-led and child-centred anticipatory action for flooding through establishment and support of community flood-preparedness committees. Baseline research carried out in December 2022 revealed that many community members described their situation as hopeless. The evaluation showed a significant change, and the results of applying participatory approaches included:

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<sup>277</sup> <https://resourcecentre.savethechildren.net/pdf/Guidance-on-AA-In-Education.pdf/>

<sup>278</sup> Save the Children (2024), End of Programme Report, Leaving No Child Behind, NORAD Framework Agreement 2019-2023

<sup>279</sup> Evaluation Report, Locally Led Anticipatory Action, Maban County, South Sudan, June 2024



- **Continued access to key services during flooding:** Many of the prioritized activities in communities were centred around ensuring access to services, markets, and safe places (such as evacuation sites). This took many different forms including new or elevated walkways, construction of bridges, or purchase of boats etc. People who for the last four years experienced such difficulties during floods they were cut off from accessing markets, health services, education, income generating activities including their farmlands, now reported to have continued access in times of flooding. This has provided more stable livelihoods, improved food security, health services, and continued access to education. It also ensured social inclusion aspect as people with disabilities could now access farmlands or markets.
- **Risk-informed decision-making community engagement and access to early warning:** The focal points for early warnings who trained under the project were reported to be successful. Communities described how they trusted the information they had started to receive and that this impacted their plans, and their hopes.
- **Hope for the future:** Numerous beneficiaries expressed that since the project started, they now had hopes for their future and for continued livelihoods and education for their children.

### 3.5.5 Environmental/DRR clubs for children

Save the Children believes children's participation is a set of civil rights to be fulfilled, a principle to be applied and a means to fulfil other rights. Crucially, to promote and support children's participation is to meet human rights obligations and to respect children and their rights. Save the Children has comprehensive experience in supporting non-formal after-school clubs and various forms of child clubs in different countries and contexts as an arena for supporting and encouraging children's meaningful participation in their communities, in decision making processes and for supporting children's learning and wellbeing. The child clubs have been studied for their effectiveness in enhancing learning. Evidence suggests these clubs can be effective for learning by fostering an environment of self-directed and collaborative learning, peer support, critical thinking, and active engagement with different educational material. Child clubs have been shown to improve various educational outcomes. For instance, girls' clubs in schools have led to better literacy and numeracy skills, higher school enrolment, and improved attendance rates. The clubs often provide a supportive environment where children can focus on their studies and receive additional help<sup>280</sup>. Child clubs can give children knowledge on DRR, CCA, and environmental protection, and children can be good communicators of risks. Children's DRR clubs in Cuba has for example included key strategies for club members to communicate to the wider community<sup>281</sup>. In research on Save the Children's Child Centred Community-Based Adaptation (CCCCA) in Bangladesh, young change agents were keen to continue their engagement in school Green Clubs which were perceived as a sustainable project activity by the researchers.<sup>282</sup>

In DRR initiatives, children have complementary perspectives and priorities to that of adults, and they can be active agents of change. Save the Children has good experience of involving children in, for example, risk mapping where children, being the experts on their own lives and reality, can identify different risks to those identified by their parents. They therefore provide a better understanding of the risk landscape. For example, 294 children (160 boys and 134 girls) in the Norad programme in South Sudan (2019 - 2023) participated in risk mapping exercises at schools. These processes led to the development of risk mitigation plans and the establishment of 76 Disaster Risk Committees for adults and children. It is however important to underline that the responsibility for making schools safe lies with adults, while children can participate in and lead activities. In the DANIDA programme in Mamban County in 2023, children reported that in previous years education was disrupted for four to five months of the year due to floods and IDPs settling in the schools but now they could access

<sup>280</sup> <https://resourcecentre.savethechildren.net/document/lessons-learned-outcomes-and-delivery-girls-clubs-educational-programmes/>

<sup>281</sup> [https://resourcecentre.savethechildren.net/pdf/css\\_policy\\_case\\_studies\\_summary\\_report\\_eng\\_2017.pdf/](https://resourcecentre.savethechildren.net/pdf/css_policy_case_studies_summary_report_eng_2017.pdf/)

<sup>282</sup> <https://www.iied.org/sites/default/files/pdfs/2022-04/20776IIED.pdf>

education the whole year round. DRR clubs spent the funding they received on making the schools safer for children. This included digging canals/dykes around the schools to divert flood water, fixing the school compound with gravel/marrams, fixing doors and windows, painting the schools to look nicer and painting climate change relevant information on the walls. The funding for the DRR clubs had also been used for establishment of school gardens and the DRR club members had high hopes for both consumption and sale of harvested vegetables as well. Some schools reported higher enrolment numbers and directly ascribed this to increased trust in the schools following the interventions of the project.<sup>283</sup>

To ensure quality child participation in ‘all processes in which children are heard and participate’, Save the Children has identified nine basic requirements for meaningful and ethical children’s participation<sup>284</sup> across our global programmes, advocacy, and campaigns. These basic requirements are all relevant for the quality of implementation of child clubs, and define that all children’s participation activities need to be:

- **Transparent and informative:** Children clearly understand their right to express their views and that they will be heard and valued. Children know why they are involved in a given activity, what their participation will help to achieve, and the types of decisions and plans that their participation will influence.
- **Voluntary:** Children have received sufficient information to understand the choices available to them, what they mean and how to engage.
- **Respectful:** Children’s views are treated with respect by adults and other children. They can initiate ideas themselves and express their views without fear of discrimination.
- **Relevant:** Children are able to draw upon their experiences, knowledge and capabilities to express their views on issues of relevance and importance to their lives.
- **Child friendly:** Children feel welcomed and are free to ask questions and raise concerns. Methods take into account children’s evolving capacities, age, diversity and capabilities.
- **Inclusive:** Each child is treated as an individual, and no child is discriminated against. Methods, approaches, languages, and arrangements do not exclude the most marginalised children.
- **Supported by training:** All adults and facilitators working with children’s participation have been trained and equipped to work effectively with children.
- **Safe and sensitive to risk:** Risks have been identified, and clear risk management plans are in place to ensure the safe participation of children.
- **Accountable:** Children receive feedback on how their contribution has advised, informed or influenced developments to date.

### 3.5.6 Integrating climate change education into curriculum and learning materials

Integrating climate change education into the national curriculum and learning materials provides the foundation for equipping society with citizens that have the skills required to fill green jobs<sup>285</sup>, adaptive life skills to cope with the stresses of climate change and eco-anxiety<sup>286</sup>, and the advocacy skills to transform unjust social and economic structures that contribute to climate change<sup>287</sup>. The international community recognizes the importance of increasing access to climate change education by embedding it in the UN Framework Convention on Climate Change and the Paris Agreement (Article 12)<sup>288</sup>. In a recent systematic review of climate change curriculum and education programmes

<sup>283</sup> Evaluation Report, Locally Led Anticipatory Action, Maban County, South Sudan, June 2024

<sup>284</sup> <https://resourcecentre.savethechildren.net/document/nine-basic-requirements-meaningful-and-ethical-childrens-participation/>

<sup>285</sup> Greening Education Partnership: Getting every learner climate-ready, UNESCO. <https://www.unesco.org/en/education/sustainable-development/greening-future>

<sup>286</sup> Hickman, C. et al. Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. *Lancet Planet. Health* 5, e863–e873 (2021)

<sup>287</sup> Kwauk, C. & Casey, O. A new green learning agenda: Approaches to quality education for climate action. <https://www.brookings.edu/wp-content/uploads/2021/01/Brookings-Green-Learning-FINAL.pdf> (2021)

<sup>288</sup> UNESCO, Climate change education, <https://www.unesco.org/en/climate-change/education>

researchers found that climate change education programmes achieve a variety of positive outcomes. Most commonly, programmes increase climate knowledge, but they also can impact learners' level of concern about climate change, their problem-solving skills, and behaviours. Effective climate change education programmes are personally relevant and meaningful, use engaging teaching strategies, encourage deliberative discussion to explore and navigate disagreements and controversial issues, engage participants in the scientific process, address misconceptions, and/or incorporate school or community projects for participants to take action<sup>289</sup>.

The South Sudan National Curriculum Framework features environmental awareness and sustainability as cross-cutting issues to be integrated across all subjects. Environmental activities are included in pre-primary education. In primary and secondary education, the skills to make good use of natural resources and guard against environmental damage and destruction are taught in Social Studies and in science subjects<sup>290</sup>. The Nationally Determined Contribution (2021) does not include a specific focus on education but includes actions to integrate climate change into the national curriculum, which involves broadly increasing understanding of climate change and upgrading school infrastructure to be more resilient to climate change impacts<sup>291</sup>. However, South Sudan does not have a guideline on how to integrate climate change into curricula and the comprehensiveness of the topics covered are limited. MoGEI has a work plan for developing Environmental Education policy (2024) which requires support.

Under the GPE-funded CSESI, MoGEI with the support of UNESCO, will identify a set of priority topics and learning outcomes on climate and the environment from local knowledge and from the Greening Curriculum Guidance<sup>292</sup>, launched in 2024 by the Green Education Partnership led by UNESCO. The global Greening Curriculum Guidance provides universal guidance for curriculum development processes towards achieving the global objective of having 90 per cent of all countries including climate change in their curricula by 2030. It identifies four key principles which underpin the design and delivery of greening education in formal, non-formal and informal settings;

- Action oriented: Content, delivery and learning activities should be empowering, learner-centred, career-related and transformative
- Justice promoting: Climate change and environmental education should be based on a human rights approach, promoting gender equality, and inter-generational as well as intra-cultural equity
- Quality content: The content needs to be scientifically accurate, convey the urgency, be age-appropriate, and indigenous influenced and balanced
- Comprehensive and relevant: Climate change and environmental education is a continuing, life-long learning process which starts at early age and building on previous learning. The content needs to be culturally relevant and context appropriate as well as inclusive and institution wide, integrated throughout the learning environment.

Further, under South Sudan CSESI, UNESCO will conduct a review of subject-level curriculum and sampled non-formal programmes for early childhood, primary, and secondary level on climate and the environment related topics and learning outcomes. Based on this analysis, a set of standard learning materials on priority topics and learning outcomes will be developed and updated that are adaptable

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<sup>289</sup> Monroe, M, Plate, R, Oxarart, A, Bowers, A and Chaves, W (2019) Identifying effective climate change education strategies: a systematic review of the research, *Environmental Education Research*, 25:6,791-812, DOI: 10.1080/13504622.2017.1360842

<sup>290</sup> South Sudan Subject Overview. [Available here](#)

<sup>291</sup> South Sudan Nationally Determined Contribution

<sup>292</sup> <https://unesdoc.unesco.org/ark:/48223/pf0000390022/PDF/390022eng.pdf.multi>

throughout formal, non-formal, and informal education. The BRACE project will then be positioned to support MoGEI in using the new climate education materials in the continued roll-out of the new basic education curriculum nationwide.

### 3.5.7 Teacher and staff development on climate change education and the environment

Integration of the topic of climate change in national curriculum and learning materials is not enough as children's learning outcomes depend on how the curriculum is effectively used and taught by teachers<sup>293</sup>. According to the 2021 South Sudan National Education Census Report, 51% of teachers in South Sudan are untrained, a majority of whom are in the pre-primary and primary education levels<sup>294</sup>. The National Teacher Education Strategy 2023 – 2027 sets out an ambitious programme to improve teacher education by addressing the issues of teacher qualification, size of the teaching workforce and the quality of teaching in South Sudan<sup>295</sup>. The strategy recommends strengthening of pre-service training in Teacher Training Institutions (TTIs) and enhancing in-service training through Continuous Professional Development (CPD) programmes. Further, the strategy notes that teachers should be trained to implement the curriculum inclusively and to address the cross-cutting issues (environmental awareness and sustainability, peace education and life skills) within the curriculum.

However, there is currently a lack of teaching materials on DRR and climate change competences. Thus, the consultation on the GPE-funded CSEI in January 2024 identified as a priority to support integration of climate and the environment into teaching through development of basic training manual for teachers and educators. Under CSEI, a training manual for teachers and educators, based on priority topics and learning outcomes identified, will be developed. The key stakeholders engaged will include MoGEI officials including master trainers at national and sub-national level, representatives of school management, teachers, teacher training institutions as well as civil society organizations.

The MoGEI in 2021 developed a curriculum for teacher training, with both in-service and pre-service options, that leads to Qualified Teacher Status (QTS)<sup>296</sup>. Development partners are supporting MoGEI in rolling out teacher training to upgrade teachers in the new curriculum, for example Save the Children in its NORAD Framework Agreement programming in Rumbek and Bor South counties (2019-2023) and Bor South and Akobo counties (2024-2028). Also, the World Bank Building Skills for Human Development in South Sudan programme's subcomponent on pre-service teacher training and in-service Teacher Professional Development (TPD) aims to reach 10,000 formal and volunteer teachers, including rehabilitating National Teacher Training Institutes (NTTIs) and support to NTTI trainers. Therefore, the BRACE programme will be positioned to support MoGEI in rolling out the use of the teacher training manual on climate change developed under CSEI together with multiple partners, immediately mainstreaming climate change education into the continued roll-out of teacher training nationwide, building sustainability of results from the start through a system-strengthening approach.

In addition to being able to achieve national reach, the BRACE project could also expect to see effective teaching of climate change for students' learning as there are already results indicating the MoGEI TPD approach is effective in increasing teacher competencies and students' learning outcomes. Results from the use of the MoGEI-led TPD in the NORAD programme (2019-2023) show that the percentage of learners able to read fluently and comprehend a story increased from 5% to 12% across the project

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<sup>293</sup> Cambridge, Climate Change Education, <https://www.cambridgeinternational.org/Images/707181-climate-change-education-introduction-paper.pdf>, referencing the Great Teaching Toolkit review, <https://www.cambridgeinternational.org/support-and-training-for-schools/leading-learning-and-teaching-with-cambridge/great-teaching-toolkit/>

<sup>294</sup> National Education Census Report 2021. [Available here](#)

<sup>295</sup> South Sudan National Teacher Education Strategy (2023 – 2027). [Available here](#)

<sup>296</sup> UNESCO. Teacher Education in South Sudan with Emphasis on Foundational Literacy and Numeracy Skills. [Available here](#)

period, while proficiency in basic addition and subtraction increased from 12.2% to 25%. The learning assessment results are also showing encouraging results across the 5 levels of reading skills, with the percentage of Grade 3 students not being able to recognize a letter reduced from 22% to 3% and the percentage of students who are able to read at word and paragraph significantly increased. The increase in literacy from the baseline was attributed to efforts to engage teachers in refresher training on teaching methodologies, lesson planning, scheme of work, and learner assessment, coupled with monitoring, supervision, and mentoring activities jointly conducted by state education officials and teacher trainers<sup>297</sup>.

### 3.5.8 Child participation in climate change including advocacy and informal media

Through several large-scale children's consultations conducted as part of Save the Children's global campaign, 'Generation Hope'<sup>298</sup> children clearly express an urgent desire to learn about climate change and environmental preservation. They want to practice their right to participation through taking part in climate actions. And they want it now. Children and youth activism is not only an impetus to extend long-standing treatment of education for sustainable development (ESD) to highlight the climate crisis, but also an end goal in itself. More youth need to be activated to address sustainability in their own lives, to educate others, and to influence public sector decision makers and private sector actors with authority to address climate change.

The Committee on the Rights of the Child emphasises the power and relevance of children's perspectives and experiences in decision-making on environmental matters at all levels, and how states must ensure "age-appropriate, safe and accessible mechanisms are in place for children's views to be heard regularly and at all stages of environmental decision-making processes for legislation, policies, regulations, projects and activities that may affect them, at the local, national and international levels."<sup>299</sup> A foundation for participation is knowledge and children should be provided environmental and human rights information.<sup>300</sup>

Save the Children in South Sudan has worked on children's participation also in advocacy. For example through supporting child-led research on hunger in South Sudan, children's representatives during the 2024 African summit in Zambia raised issues of child marriages, hunger, and conflict which put the lives of children at risk in the country. At the South Sudan pre-session, a boy and a girl who were both child rights club members participated and engaged with the UNCRC Committee of Experts.

## 3.6 Justification

Based on the current situation, the government of South Sudan does not currently have sufficient funding and required capacity to address the urgent needs of the education sector in relation to the climate risks and challenges. The South Sudan government, including both the public and private sector, have no capacity to invest in the education sector. The current donor funding focus on basic education support to ensure the children go back and stay in school without any necessary support to ensure the climate resilience of the education system. The project requests a GCF grant to finance the climate-driven intervention of the BRACE project based on the climate rationale.

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<sup>297</sup> Save the Children (2024), End of Programme Report, Leaving No Child Behind, NORAD Framework Agreement 2019-2023

<sup>298</sup> <https://resourcecentre.savethechildren.net/document/generation-hope-2-4-billion-reasons-to-end-the-global-climate-and-inequality-crisis/>

<sup>299</sup> <https://www.ohchr.org/en/documents/general-comments-and-recommendations/crccgc26-general-comment-no-26-2023-childrens-rights>

<sup>300</sup> <https://www.ohchr.org/en/documents/general-comments-and-recommendations/crccgc26-general-comment-no-26-2023-childrens-rights>

Funding a climate resilience programme in education aligns with several SDGs, particularly SDG 4 (Quality Education) and SDG 13 (Climate Action). It demonstrates a commitment to promoting quality education while addressing the urgent need for climate action in vulnerable settings. Education has been shown to contribute to economic resilience. By equipping young people with the skills and knowledge to adapt to climate change, the project contributes to the development of a more resilient workforce capable of driving sustainable economic activities.

South Sudan is aligned with GCF geographical priority areas with vulnerabilities to climate change. South Sudan's contribution to the global GHG emissions is negligible, yet South Sudan is one of the most vulnerable countries in the world in relation to climate change. South Sudan is one of the countries most affected by climate change, experiencing extreme weather events, including floods and droughts. These events disrupt educational services, displace populations, and exacerbate existing challenges within the education sector, creating an urgent need for a climate resilience project.

Funding a climate resilience project under the education sector in South Sudan is crucial for safeguarding education, promoting sustainable community practices, and preparing future generations to address the challenges of a changing climate. Such an investment not only addresses immediate educational needs but also contributes to long-term resilience and sustainable development in South Sudan.

### 3.7 Geographic and beneficiary selection

#### 3.7.1 Geographic selection

The BRACE project will directly implement in six counties in six states within South Sudan, which were selected based on a combination of the following factors:

- Climate and socioeconomic vulnerability
- Synergies with other projects or programmes in the areas of interest
- Government and other stakeholder consultations

The analysis presented in this feasibility study highlights the key vulnerabilities at a state level. In South Sudan, the primary climate risks facing the population and the education sector are erratic rainfall, increased flooding/flash flooding, drought, heat stress, and temperature related wildfires. This impacts almost all areas of the country. Some areas in the greater upper Nile region (the White Nile delta, specifically Jonglei, Upper Nile, Unity states) are more regularly impacted by flooding, given South Sudan's topographical context,

The analysis found that six of the ten States are more vulnerable than others and as a consequence these have been prioritised:

- **Jonglei:** Rainfall is highly varied and unpredictable with the wettest month recording up to 142.8mm. Flooding is a key vulnerability with extreme events evidenced such as on the 2017 flood resulting in 77 schools impacted and about 26 schools being completely damaged (IIEP, 2022)
- **Upper Nile:** The State experiences the most temporal and varied precipitation and dry spells because of the continental air mass oscillation in South Sudan. It has highest records of warm tropical nights 31.0°C, and is susceptible to droughts, heatwaves, wildfires, and flash flooding.
- **Unity:** Monthly temperature records up to 42.16°C, soil aridity is high, soil moisture will reduce up to 8% by 2040, and this will exacerbate droughts conditions and increase periods when wildfires return.



- **Warrap:** The State records the highest monthly precipitation value of 212.04mm and is highly vulnerable to flooding. Flooding would alter alternative education programmes in hard-to-reach areas and pastoralist communities
- **Lakes:** Precipitation and temperature are unpredictable, recording up to 179.18mm and 35.8°C respectively. At the time of writing, flooding is disrupting school activities. However, RCP 8.5 projection showed a 7% drop in soil moisture, and a 2% decrease in precipitation by 2040. This will significantly increase naturally occurring droughts conditions, wildfires, flooding, and extreme climatic conditions.
- **Eastern Equatoria:** Temperatures record highest at 35.05°C in the month of February and lowest at 17.33°C in the month of December. Rainfall is bimodal with two peaks occurring in May and July. The State experiences interannual variability of precipitation caused by pulsation of the Northern tropical continental air mass and the Southern maritime continental air mass bringing moist southerly air and convectional rainfall. Hence, the State has at least 4 days of rainfall in every month with mean precipitation ranging from 8.68mm to 176.08mm. There is a high confidence that extreme flood events would stress school buildings and infrastructure in this decade. If not retrofitted, many schools in the state will be unsafe for learning.

Climate vulnerabilities, particularly relating to education in all ten states and three administrative areas, were presented to State-level and national-level Government officials during the design workshop on 21-24 May 2024 (see **Annex 7: Stakeholder engagement** for more information). Officials agreed that these six states were the most appropriate for selection for the project based on vulnerability and needs based on available data.

However, as described in sections 1-2, the entire country of South Sudan is highly climate vulnerable, with extremely low adaptive capacity and extremely high exposure. All states are vulnerable to a multitude of climate change hazards primarily flooding and drought throughout different periods of the year.

Within states, the next administrative level down is ‘county’, with each county having its own government representatives across different sectors, including county-level education officials. County is also usually the smallest unit of analysis for several key indicators, including data on flooding, food insecurity, and other socioeconomic indicators. For that reason, the project team used data on the following indicators at county-level to provide an overall ‘vulnerability score’:

- Population impacted by flooding
- Population classed as ‘severely food insecure’ (IPCC classification)
- Population impacted by heat waves
- Education enrolment rates (girls and boys)

In addition to the score obtained by analysing the raw data, the project team considered implementing BRACE in counties with different climatic conditions. There are several counties that are most impacted in terms of overall hectares flooded per year, but the project team did not want to focus BRACE solely on swamp or flooded areas. The selection also considered areas outside (but directly neighbouring) the most impacted flooded areas, which received a high number of displaced people every year, and which were at risk in the future, for example Rumbek North county in Lakes State. This county still experiences flooding itself, but also receives many displaced persons due to extensive flooding in neighbouring counties in Unity State.

The analysis suggested five counties in five states which are a combination of heavily flooded states, states experiencing droughts regularly, and those neighbouring heavily flooded states.



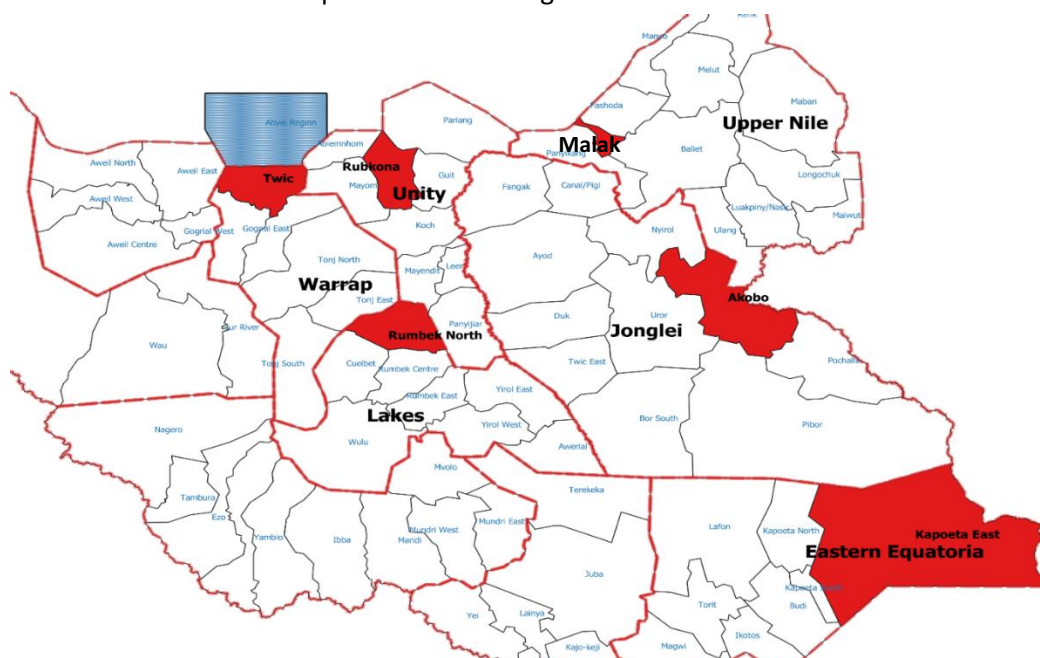
The project design team presented the analysis and the final states selection to the Minister for Education and her Director Generals (see **annex 7: stakeholder engagement** for further details). There was broad agreement on the counties, other than the recommendation to swap one county within Upper Nile State (Maban county was removed in favour of Malakal county) due to the perception of a large number of existing programmes in Maban county.

The other change was the recommendation to add the county of Kapoeta East, in Eastern Equatoria state. Kapoeta East is highly vulnerable to drought, and Ministry officials confirmed that it was lacking in other support for education or climate-resilient interventions.

Hence, the final selected counties are as follows:

| State             | County       | Vulnerability | Population       | Total schools | Total enrolments  | Average pupils |
|-------------------|--------------|---------------|------------------|---------------|-------------------|----------------|
| Unity             | Rubkona      | 9             | 308,683          | 90            | 42,343            | 470            |
| Jonglei           | Akobo        | 8.35          | 90,839           | 58            | 18,237            | 314            |
| Lakes             | Rumbek North | 7.45          | 73,963           | 29            | 6,987             | 241            |
| Warrap            | Twic         | 7.05          | 433,796          | 226           | 83,238            | 368            |
| Upper Nile        | Malakal      | 5.35          | 76,231           | 65            | 19,706            | 303            |
| Eastern Equatoria | Kapoeta East | 4.4           | 319,113          | 42            | 6,807             | 162            |
| <b>Total</b>      |              |               | <b>1,302,625</b> | <b>510</b>    | <b>177,318.00</b> | <b>347.7</b>   |

The selected counties are presented in the figure below.



**Selected counties under the BRACE project. (Source: United Nations OCHA map with areas of intervention overlaid)**

### 3.7.2 Beneficiary selection

Within each county, there will be a number of schools selected for the different interventions.

For the infrastructure and WASH improvements, a total of 30 schools will be selected which will create 10,430 child beneficiaries (the number is reached by 30 schools multiplied by the average number of pupils per school in the 6 target counties), and an additional 21,084 adult beneficiaries. This assumes that each child has at least two parents, carers, or guardians who will also benefit from the improved WASH at the community level when attending school meetings and events. In addition, school staff will also benefit from the infrastructure improvements with 179 male and 45 female teachers, a total of 223 school staff across the target schools. This creates a total of 31,514 direct beneficiaries for WASH and infrastructure improvements. (Figure above).

75 schools across 6 counties are targeted to receive training on green school initiatives and DRR/CCA. This leads to a total of 26,076 direct child beneficiaries, 488 school staff or PTAs, 180 government officials (who will receive ToT), and 488 additional community members.

For the distribution of learning materials and further training of teachers under output 1.4, there are a greater number of direct beneficiaries. The training will target all 510 schools in the 6 target counties, bringing 3 teachers per school for training at county-level, which means 1,530 direct teacher beneficiaries. Additionally, learning materials will be distributed to all schools in the county, with a total learner population of 177,318 child beneficiaries. The 510 total schools in the county will benefit from improved teachers' knowledge relating to climate change, new learning materials, and monitoring visits facilitated by the projects from county officials to follow up on the teacher training.

The total number of schools targeted by the BRACE program in South Sudan without double counting is 510 schools. As highlighted above, not all schools will benefit from all outputs.

The BRACE project in South Sudan will collaborate with MoGEI to prioritize schools that are most severely affected by extreme weather events, such as floods, strong winds, droughts, and heatwaves. A range of factors will be used to assess the impact on schools and communities, and the criteria below will be refined and weighted in consultation with the BRACE project Management Committee. With the schools selected based on:

The selection of schools will be prioritized based on the following eligibility criteria:

### **1. Climate vulnerability**

Exposure to climate risks and underlying social vulnerabilities, including past climate impacts and socioeconomic conditions. Schools where the highest amount of learning loss due to school closures and/or absenteeism caused by climate-related impacts. Informed by the Ministry of General Education and Instruction (MoGEI).

### **2. Infrastructure condition and location**

Schools with unsafe, poorly maintained, or climate-exposed infrastructure, including buildings, roofs, WASH systems, and proximity to unsafe structures (e.g. water towers, large trees). Factor in topography and site-specific risks such as low-lying floodplains, swampy terrain, or coastal exposure. Retrofitting existing school facilities only will be eligible to be included, in line with SCA's GCF Environmental and Social Safeguards (ESS) Category C accreditation.

### **3. Population and occupant capacity**

Size of the community, student population, and occupant capacity of the premises. Priority given to schools with larger student populations. Considers average daily attendance and the school's suitability and capacity if used as a community shelter.

#### **4. Equity and inclusivity**

Schools that contain the highest proportions of students from vulnerable, disadvantaged or marginalised population groups (e.g., girls, children with disabilities, remote communities). Prioritise schools where interventions will reduce inequality and enhance inclusive access to safe, climate-resilient learning environments or emergency shelters.

#### **5. Alignment with local policies plans**

Consistency with national and local adaptation policies and strategies, education sector plans, or existing community disaster risk reduction frameworks. Preference given to schools designated as evacuation centres or those engaged in preparedness initiatives. Avoiding duplication by excluding schools that have already received significant climate-related infrastructure support (e.g. otherwise supported through emergency response or post-emergency recovery).

#### **6. Security and access**

Schools accessible with support from security mitigation measures based on existing evidence and operations in-country.

### **3.8 Implementation arrangements**

The BRACE project in South Sudan will be governed in a similar way to previously approved funding Proposals by Save the Children Australia. The Government of South Sudan, particularly through the Ministry of General Education and Instruction, have had a strong role in the project design, and will be an implementing partner.

*\*This portion has been redacted in accordance with the GCF Information Disclosure Policy, as the portion is confidential under the disclosure policy of the Accredited Entity\**

The steering committee for this project will be co-chaired by Save the Children South Sudan and MoGEI, and also comprise of the following Ministries:

- Ministry of Water, Resources, and Irrigation
- Ministry of Gender, Children, and Social Welfare
- Ministry of Environment and Forestry
- Ministry of Disaster Management and Humanitarian Affairs

The purpose of the steering committee will be to provide overall guidance to the project and make crucial decisions as a governance body.

Save the Children will directly implement the project in Kapoeta East (Eastern Equatoria State) and Akobo (Jonglei state). In four other counties, namely Rumbek North (Lakes state); Malakal (Upper Nile State); Twic (Warrap State); and Rubkona (Unity state), the project will be delivered by four implementing partners. These were selected based on previous partnership assessments by Save the Children, and judged based on a set of criteria including: prior experience in relevant thematic areas (education, climate resilience); ability to demonstrate sound financial management; and organisational policies and procedures.

As an executing entity, Save the Children South Sudan is uniquely placed to deliver the BRACE project in the country. Save the Children in South Sudan is currently implementing the GPE Accelerated Funding floods response programme integrated within the ECW Multi-Year Resilience Programme

(MYRP-2023-2026) along with other education programmes in South Sudan. The award value of the program is USD \$10,000,000.

Save the Children South Sudan has demonstrated its readiness and ability to work with a broad range of donors, including GPE, ECW, EU, UNICEF, USAID, FCDO, BMZ, SIDA, NORAD, DANIDA, IGAD, UNOCHA, ECHO, and other UN agencies, as well as private donors. The programmes and projects funded by these donors were implemented in partnership with line ministries, including the MoGEI, and MGCSW in South Sudan. Save the Children implements its education programmes in partnership with other international and development partners, including Norwegian Refugee Council (NRC), Finn Church Aid (FCA), Light for the World (LFTW), Plan International, United Nations Educational, Scientific and Cultural Organization (UNESCO), AVSI, World Vision, and local partners which include Support for Peace and Education Development Programme (SPEDP), Nile Hope (NH), Community Mobilization for Development (CMD), Health and Education for South Sudan (HESS), and Peace and Community Outreach (PCO). Save the Children also works with grass root community-based organization like Motherhood Initiative, Maban graduates Union, Youth and Women Association to reach the unreachable.

Following the GPE Accelerated Funding modality under MYRP 2023-2026, Save the Children and MoGEI have been implementing in more collaborative ways, with deeper and shared responsibilities in the planning, implementation, and monitoring of all activities. This opens channels for mutual accountability and enhances checks and balances. This approach also ensures project sustainability and enhances capacity of the MoGEI staff through joint planning, implementation, and monitoring as the Ministry has the ultimate responsibility to provide services and oversight of education implementation. Save the Children therefore recognizes and aims to strengthen its close working relationship with South Sudan's MoGEI.

Save the Children's education programme focuses on understanding and responding to the protection and developmental rights of children in general, and that of the most vulnerable and marginalized children, to bring about meaningful impact on their lives. As one of the largest INGOs in South Sudan supporting the education sector, Save the Children is a key strategic partner and plays an auxiliary role to the MoGEI. Save the Children's education programme works through government institutions at devolved levels, and its role is to provide technical and financial support contributing to the overall implementation of the government's education sector plans. Specifically, Save the Children's education work focuses on:

- a) Long-term strengthening of education ministries' system, including sector policy and strategy development; providing and managing technical advisors; leadership and skills development; and overall enhancing organizational and institutional capacity.
- b) Improving access to pre-primary, primary, including Alternative Education Systems (ALP, Pastoralist education), secondary and tertiary education, including vocational training.
- c) Improving quality of education like continuous teacher professional development and management; providing teaching learning materials; curriculum development; and learning assessments.
- d) Enhancing gender and inclusion of children with disabilities.
- e) Education in Emergencies (EIE) support to ensure IDP and other crisis-affected children continue their learning during emergencies.
- f) Building climate-resilient education systems.

The table below summaries Save the Children's track record and experience in education programming in South Sudan:

| Key programme information   | Outcome Areas   |
|---|---|
| <b>Title: Multiyear Resilience Programme</b><br><b>Donor : ECW</b><br><b>Amount: \$40,000,000</b><br><b>Duration : 3 years (2023-25)</b><br><b>Status : Active</b>  | <ol style="list-style-type: none"> <li>1. Safe, equitable, gender responsive, and uninterrupted access to protective and quality learning opportunities increase for crisis-affected girls and boys including those with disabilities.</li> <li>2. The quality of teaching and learning is improved in crisis-affected communities through inclusive and gender transformative approaches.</li> <li>3. Education becomes more inclusive through comprehensive, gender transformative and disability inclusive strategies.</li> <li>4. The education system becomes more responsive and resilient to the impacts of crisis through improved data for decision-making, strengthened coordination, and meaningful engagement of local actors.</li> <li>5. Sufficient resources are mobilized to scale the implementation of the multi-year programme, respond to cyclical and new crises, build sector capacities, and monitor programme quality.</li> </ol> |
| <b>Multi-Year Resilience Programme (South Floods Response) – Accelerated Funding</b><br><b>Donor : GPE</b><br><b>Amount: \$10,000,000</b><br><b>Duration : 18 Months (2023-2024)</b><br><b>Status : Active</b>  | <ol style="list-style-type: none"> <li>1. Safe, equitable, gender responsive, and uninterrupted access to protective and quality learning opportunities increase for crisis-affected girls and boys including those with disabilities.</li> <li>2. The quality of teaching and learning is improved in crisis-affected communities through inclusive and gender transformative approaches.</li> <li>3. Education becomes more inclusive through comprehensive, gender transformative and disability inclusive strategies.</li> <li>4. The education system becomes more responsive and resilient to the impacts of crisis through improved data for decision-making, strengthened coordination, and meaningful engagement of local actors.</li> <li>5. Sufficient resources are mobilized to scale the implementation of the multi-year programme, respond to cyclical and new crises, build sector capacities, and monitor programme quality.</li> </ol> |
| <b>Integrated, protective education and realization of human rights for crisis affected girls and boys in South Sudan</b><br><b>Donor: NORAD</b><br><b>Amount : \$9,300,000</b><br><b>Duration : 4 Year Framework (2020-2023)</b><br><b>Status : Active</b> | <ol style="list-style-type: none"> <li>1. An enabling environment created to ensure vulnerable children and youth in crisis-affected communities in Bor and Akobo counties have access to safe, equitable, quality, and inclusive education.</li> <li>2. Strengthened child protection system at national and sub-national levels.</li> <li>3. Governments respect, protect and promote child rights, and are held to account by children and civil society.</li> <li>4. Children are better protected from the impacts of climate change and environmental degradation and are part of the solution to build up climate resilience.</li> </ol>   |
| <b>Support for Education and Successful Transitions among vulnerable children in South Sudan</b><br><b>Donor: SIDA</b>  | <ol style="list-style-type: none"> <li>1. Improved access to and completion of education or skills-based opportunities for vulnerable children and youth in crisis-affected communities.</li> </ol>   |

|   |  |
|---|--|
| <p><b>Amount : \$8,680,000 + \$750,000 Costed Extension</b><br/> <b>Duration : 3 Yr Framework + 8 Mths CE</b><br/> <b>Status : Closing</b></p>  | <ol style="list-style-type: none"> <li>2. Enabling learning environments are supported by quality teaching, inclusive methodologies, and school-based protection mechanisms.</li> <li>3. Improved community-based and institutional system efficiency in school governance and education.</li> </ol>   |
| <p><b>Improved Accountability and Governance on Children and Youth Rights through increased Access to Education, Protection and Participation</b><br/> <b>Donor : DANIDA</b><br/> <b>Amount: \$4,560,000</b><br/> <b>Duration : 5 Year Framework (2022-2025)</b><br/> <b>Status : Active</b></p>  | <ol style="list-style-type: none"> <li>1. Strengthened community ownership and delivery of inclusive, quality and protective learning for girls and boys affected by crisis and conflict in South Sudan.</li> <li>2. Protection and wellbeing of children and youth strengthened at all levels (home, school, community).</li> <li>3. Children and youth are empowered, strengthened and facilitated to play an active part in influencing decision making on issues of their concern at all levels of the society.</li> </ol>   |
| <p><b>Themes:</b><br/> <b>1. Protecting the individual child and supporting the family.</b><br/> <b>2. Ensuring girls and boys are safe at school</b><br/> <b>3. Working with communities to protect girls and boys</b><br/> <b>Donor : Telethon</b><br/> <b>(Norway fundraising campaign)</b><br/> <b>Duration : 2024-2028</b><br/> <b>Status : Active</b></p> | <ol style="list-style-type: none"> <li>1. Response to child protection risks in Kapoeta and Bor South Counties is enhanced.</li> <li>2. Improved access to safe, equitable, quality, and inclusive education for vulnerable children and youth in Kapoeta Counties in South Sudan.</li> <li>3. Girls and boys have improved access to child protection services in their communities.</li> </ol>   |
| <p><b>Building the Climate Resilience of Children and Communities through the Education Sector (BRACE)</b><br/> <b>Donor: GCF and GPE</b><br/> <b>Amount: \$12,000,000 and \$4,000,000</b><br/> <b>Duration : 5 years (2025-2029)</b><br/> <b>Status : Funding secured, currently under full design phase</b></p>   | <ol style="list-style-type: none"> <li>1. BRACE project seeks to empower education system and communities to withstand and recover from the impacts of climate change.</li> </ol>  |
| <p><b>Climate Smart Education Systems Initiative (CSESI)</b><br/> <b>Donor : GPE</b><br/> <b>Amount : \$650,000</b><br/> <b>Duration : 1 year (2024 – 2025)</b><br/> <b>Status : Ongoing prioritization of implementation areas is in progress</b></p>  | <ol style="list-style-type: none"> <li>1. Education ministries have enhanced capacities to develop evidence-based policies and plans for climate change adaptation and environmental sustainability.</li> <li>2. Education sector coordinates effectively internally and with other sectors around climate change policy and programming (including disaster risk management mechanisms).</li> <li>3. Education ministries are able to access increased climate financing for education sector activities.</li> <li>4. Education sector has timely access and capacity to use climate-related data and integrates it into its planning and monitoring systems.</li> <li>5. Education Infrastructure is safer, greener and more resilient to the impacts of climate change</li> <li>6. Education ministries are better equipped to improve the resilience of schools to climate risks, including enhanced capacity to strengthen school safety and educational continuity management.</li> <li>7. Education system integrates climate change and environmental sustainability into curricula, pedagogy and teacher training.</li> </ol> |

|  |  |
|--|--|
| <b>NORAD Framework 2024-2028</b><br><b>Donor : NORAD</b><br><b>Value : \$9,200,000</b><br><b>Duration : 5 years</b><br><b>Status : Active</b>  | <ol style="list-style-type: none"> <li>1. Increased enrolment, retention, and transition of learners in schools.</li> <li>2. Improved learning outcomes for children in protective and inclusive primary schools and Accelerated Learning Programme centres.</li> <li>3. Increased engagement and participation of CSOs and community structures on school management and support for safe, inclusive and quality education.</li> <li>4. Reduced vulnerability and exposure to climate and environmental hazards for children and communities.</li> <li>5. Improved school and community capacity to prepare and respond to climate change events.</li> <li>6. Children and Civil Society Organisations (CSOs) monitor and report on the government's delivery on child rights.</li> <li>7. The government has systems and capacity to respect, protect and promote child rights.</li> <li>8. CSOs have the capacity to advocate and lobby for the realization of children's rights.</li> <li>9. Improved access to timely and quality child protection responsive service and support for children at risk.</li> <li>10. Improved protection of children at risk through prevention and mitigation efforts.</li> <li>11. Improved capacity and functionality of the State Ministry of Gender, Child and Social Welfare to support children and women at risk and implement provisions of the National Plan of Action for Children.</li> </ol> |
| <b>Education Localization Fund</b><br><b>Donor : People's Postcode Lottery (PPL)</b><br><b>Amount : GBP 500,000</b><br><b>Duration : 1 year (April 2024 –March 2025)</b><br><b>Status : Implementation ongoing</b> | <ol style="list-style-type: none"> <li>1. The education sector has improved mechanisms to support local and national NGOs through EiE flexible funding.</li> <li>2. National and local education NGOs have improved organizational capacity and ability to respond to education sector need.</li> <li>3. Children, teachers, and other education personnel and stakeholders benefit from the delivery of EiE programming.</li> </ol>   |

With this funding, Save the Children has achieved the following impact in South Sudan:

- 168,458 humanitarian crises affected children in IDPs (76,378 girls) supported with increased access to quality basic education in an inclusive and protective learning environment
- 223 schools/education facilities constructed and/or rehabilitated to improve the learning environment
- 294 community education committee members trained on various topics, including resource mobilization and development of schools
- 1,544 children with disability were screened and supported with assistive devices based on their needs to facilitate their learning
- 2,281 (421 female) teachers were supported in professional teachers development
- 1.5 million textbooks were printed and distributed to all supported schools, over 1.5 million children received individual teaching and learning materials, including textbooks and recreational materials
- Development of the Girls Education strategy
- Evaluation of the Girls Education strategy
- Conducted learning outcome assessments (nationwide)

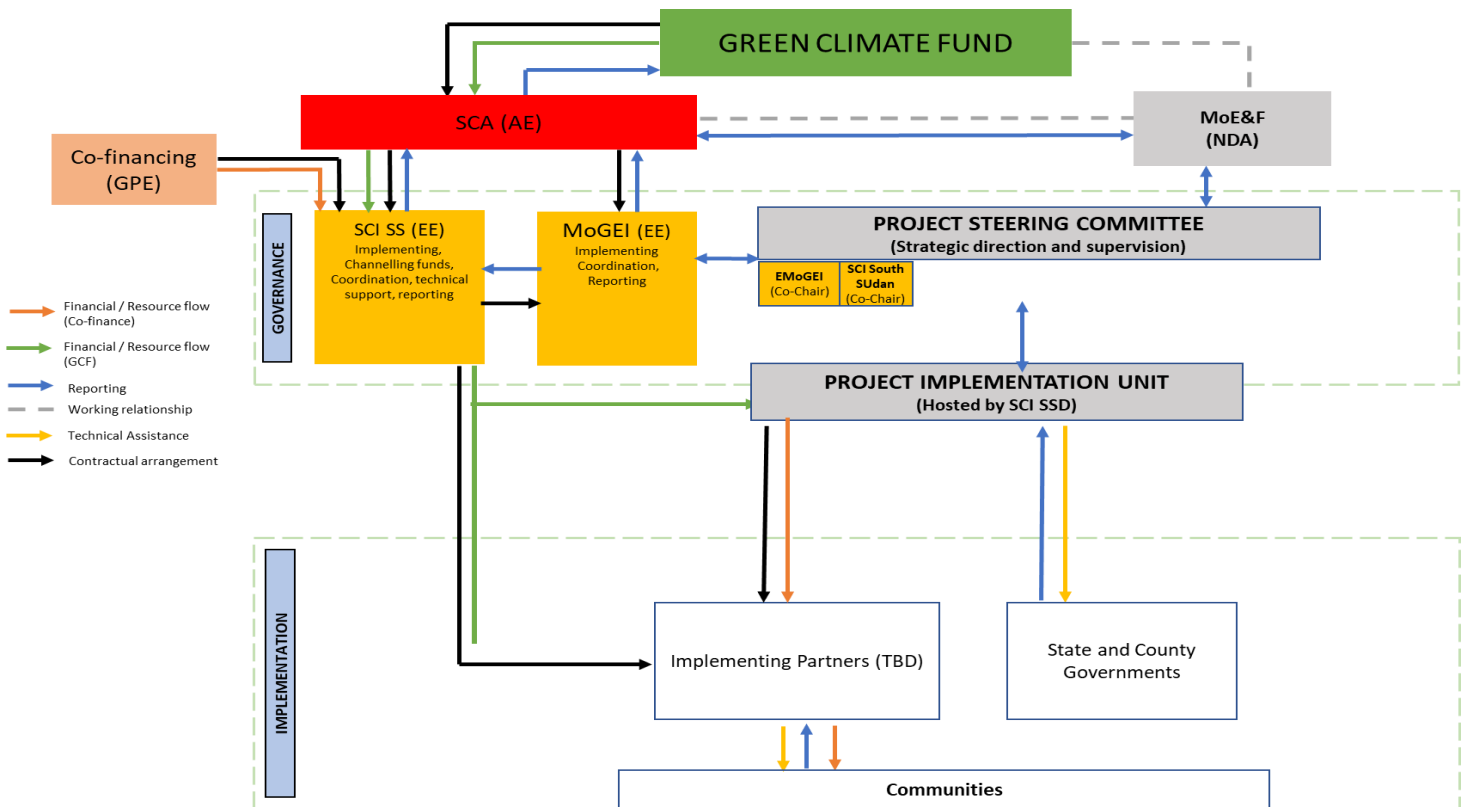


- Capacity building training for MoGEI staff on management, monitoring, and reporting
- Development of National Education Inclusive policy
- Supported the Education Sector Analysis
- Supported the development of the General Education sector Plan (2018-2023)
- Supported the development of the GPE Partnership Compact.

Save the Children is a Co-lead for the Education Cluster, together with UNICEF, plus chairs and leads the sub-cluster in some states. Save the Children is an active member of the Local Education Group (LEG) and currently a member of the Research and Learning technical working group hosted by MoGEI.

Save the Children is implementing and has implemented similar programmes and projects in Afghanistan, Bhutan, Myanmar, Papua New Guinea, Somalia, Syria, Tonga, and Vanuatu. Save the Children works with the government in general and the Ministry of Education to support the implementation of education policies and the development and implementation of the General Education Sector Plan as a task team member. It also supports the development of the GPE Partnership Compact as a task team member, supporting policies and framework developments, including key interventions of capacity building and establishment of key systems at all levels. This has been achieved through embedding technical advisors in the Ministry to provide strategic direction, leadership, and management of the education sector at various levels.

Save the Children's geographic footprint in South Sudan is extensive and consists of 2 implementing area offices and 10 field offices with over 500 staff. In addition, Save the Children has strong performance and quality management operational procedures, logistical and procurement services support, and risk and security services and advice, which results in a strong value for money proposition. In 2023, Save the Children's overall education reach in South Sudan was 168,458 children (76,378 females).



## Financial management and procurement

*\*This portion has been redacted in accordance with the GCF Information Disclosure Policy, as the portion is confidential under the disclosure policy of the Accredited Entity\**

## Performance management/auditing/procurement at project level.

*\*This portion has been redacted in accordance with the GCF Information Disclosure Policy, as the portion is confidential under the disclosure policy of the Accredited Entity\**

### 3.9 Risk factors and mitigation measures

| Selected Risk Factor 1 – Low Technical Capacity   |               |  |
|---|---------------|--|
| Category  | Probability   |  |
| <u>Technical and operational</u>  | <u>Medium</u> |  |
| Description   |               |  |
| Limited technical capacity among local stakeholders, including education authorities and community members, could hinder the effective implementation and sustainability of climate adaptation measures in South Sudan, Cambodia, and Tonga, potentially leading to suboptimal project outcomes.  |               |  |
| Mitigation Measure(s)   |               |  |
| The BRACE initiative will implement a comprehensive capacity-building programme targeting government officials, local communities, and project partners across South Sudan, Cambodia, and Tonga. This programme will focus on enhancing technical knowledge in climate-smart education systems, disaster risk reduction, and child protection in schools, aligned with national frameworks like Cambodia's Comprehensive School Safety Framework (CSSF) and the Child-Friendly School Program. To support this, BRACE will establish national and sub-national platforms for knowledge sharing and coordination, particularly through activities such as virtual and offline child-and-youth-led campaigns for climate action and cross-coordination meetings between ministries and relevant actors. Regular monitoring and mentoring mechanisms will be put in place to ensure the application of learned skills and knowledge, with continuous technical support provided to local stakeholders to foster long-term capacity development. Additionally, partnerships with local universities and technical institutes will be established to strengthen the sustainability of these capacity-building efforts. |               |  |
| Selected Risk Factor 2 – Climate Vulnerability  |               |  |
| Category  | Probability   |  |
| <u>Technical and operational</u>  | <u>Medium</u> |  |
| Description   |               |  |
| High vulnerability to climate change impacts, such as extreme weather events and sea-level rise, could disrupt project activities and threaten the safety and livelihoods of target communities in South Sudan, Cambodia, and Tonga.  |               |  |
| Mitigation Measure(s)   |               |  |

BRACE will incorporate climate risk assessments into its planning and implementation phases to ensure that interventions are resilient to local climate conditions. In Tonga, for instance, the project will prioritize retrofitting school infrastructure to withstand extreme weather, including improving airflow, drainage, and accessibility. In Cambodia, BRACE will support the establishment of school-based EWS linked to national platforms for real-time impact monitoring, enabling schools to better prepare for and respond to climate-related events. The project will also promote adaptive agricultural practices and livelihood diversification to enhance community resilience. Infrastructure improvements, such as climate-resilient WASH facilities, will be prioritized to protect vulnerable populations. Emergency response plans will be developed and regularly updated, with ongoing collaboration with meteorological agencies and climate experts to provide data and insights that inform adaptive management. Regular drills and simulations will be conducted to ensure readiness for climate-related disruptions, and partnerships with local communities will be fostered to strengthen local capacities for disaster risk reduction.

### **Selected Risk Factor 3 – Fraud and Corruption**

| <b>Category</b>             | <b>Probability</b> |
|-----------------------------|--------------------|
| <u>Prohibited practices</u> | <u>Medium</u>      |

#### **Description**

The risk of fraud and corruption in financial management and procurement processes could lead to the misallocation of funds, compromising the project's integrity and outcomes.

#### **Mitigation Measure(s)**

Key mitigation measures will include strict adherence to anti-fraud and anti-corruption policies, compliance with national institutional structures, and the application of robust monitoring and reporting procedures. BRACE will enforce anti-fraud and anti-corruption policies through rigorous audits and transparent reporting mechanisms, with oversight provided by an independent PIU team. Digital tools will be employed to track expenditures and procurement processes, reducing opportunities for corruption. Furthermore, all project staff and partners will undergo mandatory training on ethical standards, anti-corruption practices, and the consequences of non-compliance. A whistleblower protection mechanism will be established to encourage the reporting of suspicious activities without fear of retaliation. Regular risk assessments will be conducted to identify and address any emerging vulnerabilities in financial management, and specific procedures, such as the separation of duties between project management and executing entities, will be employed to maintain independent and effective financial oversight.

### **Selected Risk Factor 4 – Construction Risk**

| <b>Category</b>                  | <b>Probability</b> |
|----------------------------------|--------------------|
| <u>Technical and operational</u> | <u>Medium</u>      |

#### **Description**

Lack of design input and requisite supervisory budget results in poor quality of design and poor workmanship.

#### **Mitigation Measure(s)**

Supervision will be carried out by qualified Save the Children Structural Engineers/Construction Managers or a qualified third party. Technical consultations will include the Save the Children Regional Office Construction Advisor to ensure safe programming and appropriate project design. At least 10% of the budget is dedicated to supervision and also covers construction costs, staff supervision, and fleet requirements. Safety and security assessments will be conducted with guidance from the country office safety focal point and GEDSI specialist. The retrofitting design aims to enhance building resilience and will include planning that covers site

surveys, water and power supply assessments, site access conditions, hazard risk assessments, environmental impact considerations, building consent acquisition, and market surveys for material availability. Adequate time will be allocated for the recruitment and induction of technical staff, as well as for design/assessment, site selection (including Safety Audit and Accessibility Assessment), tendering, contractor assessment, construction implementation, approval processes, and accounting for potential seasonal interruptions due to weather. The proposed rehabilitation/retrofitting of school buildings will undergo structural engineering assessment by a qualified civil engineer and will incorporate design principles for vulnerable beneficiaries, integrated WASH, and inclusion measures.

### 3.10 GCF Investment Criteria

#### 3.10.1 Impact potential

The project will contribute to the GCF's overarching adaptation impact – increased climate-resilient sustainable development – by directly increasing the climate resilience of the education system in South Sudan, benefitting children **within a total of 510 schools** across the project, with an estimated total of **201,575 direct beneficiaries (105,095 female)** (based on average school enrolments per school, and including additional beneficiaries from the wider communities). Of these, just over half (52.5%) will be women and girls. BRACE in South Sudan will also impact an estimated **4,572,682 indirect beneficiaries**, which is the total population of the 6 target counties, minus the direct project beneficiaries and 52.5% will be women and girls. The direct beneficiaries comprise 2% and indirect beneficiaries comprise 41% of the national population of South Sudan.<sup>301</sup>

BRACE will achieve impact by embedding climate-resilient strategies throughout the education sector within South Sudan, at all levels. There are activities to develop new policies and strategies and write into law, as well as create climate-driven Emergency Preparedness Plans at state and county levels, with the national system strengthened by officials at different administrative levels undertaking ToT on climate change and education.

BRACE will contribute to climate-resilient development across different counties in South Sudan by allowing vulnerable school pupils and communities to adapt to climate variabilities and extremes, by providing knowledge on early warning systems, disaster risk reduction, and natural resources adaptation methods through green school initiatives. It will further implement climate-resilient infrastructure and WASH facilities at schools, which can serve as centres for communities and a source of clean water for hygiene purposes. By both imparting knowledge and installing new equipment and technologies, the project builds overall capacity to adapt to future climate change and shocks. By disseminating and utilising appropriate climate information and taking targeted and inclusive actions to reduce climate vulnerabilities, the project will further minimize costs and consequences of climate change.

#### 3.10.2 Paradigm shift

By working closely with the MoGEI and the MoEF (among other key ministries in South Sudan), BRACE will catalyse a paradigm shift as reflected in the ToC, and contribute to the strengthening of the enabling environment and mitigation of key barriers, such as governance, social, financial, technological, gender and social inclusion and institutional. It will do this in the country by comprehensively strengthening institutions, planning, knowledge, management and practices to enhance the climate-resilience of schools and the education sector more broadly.

The project will encourage **replicability and scalability** by creating learning materials for teachers and pupils (activity 1.4.1 – 1.4.2), which can be embedded into the national teacher training manual, and national curriculum. Key messages for EWS will be created and materials printed at national level, allowing for the MoGEI, MoEF, and Ministry of Humanitarian Affairs, to replicate and disseminate messages widely in future projects. The training model rolled out on DRR and CCA, including green schools, will be based on materials created under the CSEI project. Lessons learned from implementation of the training in the six target counties, will be taken forward for future projects to implement green school initiatives particularly, as well as broader climate resilience training.

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<sup>301</sup> Worldometer, [South Sudan population](#), accessed 29/07/2024

There is a **strong potential for knowledge exchange and learning**, with the project budgeting for additional research projects to evaluate the impact of particular interventions. Quasi-experimental studies are envisaged within the project MEAL framework, to identify causal impact of the interventions. The project will fund learning events as part of the research studies, which will be attended by a range of government, NGO and institutional stakeholders. Many of the interventions are relatively new within the South Sudanese context and as such, BRACE is in a unique position to test the ideas on a relatively small scale and share key findings with all relevant bodies.

### 3.10.3 Sustainable development

BRACE in South Sudan aligns with several SDGs. Specifically: SDG4: Quality education for all; SDG5: Achieve gender equality and empower all women and girls; SDG 6: Ensure availability and sustainable management of water and sanitation for all; SDG11: Sustainable cities and communities, through making human settlements inclusive, safe, resilient and sustainable; SDG13: Take urgent action to combat climate change and its impacts.

There will also be several co-benefits through the BRACE South Sudan project:

**Co-benefit 1: Gender and Social inclusion** through community participation in activities, particularly forming community-wide DRR committees which involve children, community leaders, parents and teachers. Involving schools and communities in project design through needs assessments and school prioritisation exercises will help ensure ownership of design and implementation of activities while providing opportunities for learning in marginalised schools and communities especially around green schools and new WASH facilities. There will further be **gender co-benefits**, as the project will implement activities promoting menstrual hygiene, and creating dignity kits for girls at schools, as well as teachers. Improving the WASH facilities near schools and communities will reduce the burden on women and girls, who bear the brunt of activities related to water collection and washing.

**Co-benefit 2: Environmental** through the improved WASH facilities and the green school initiatives. Improved WASH facilities, including latrines, improved waste management systems and improved hygiene practices. The project will also work in areas of South Sudan where water is impacted by oil production, particularly in Rubkona county in Unity State, and will conduct comprehensive water testing to ensure schools and communities are not using water impacted by oil.

**Co-benefit 3: Social** Increased Locally-led Adaptation (LLA) - Influencing the LLA agenda working at the local school level with children, resident teachers and parents/community members. LLA can be amplified through project deliverables such as the building and implementation of school safety plans, child clubs, NAP participation, finance roadmap development and collaboration/south-south learning. Such interventions lend themselves to LLA such as through devolved decision-making and inclusion of marginalised people. School community-led initiatives and engagement may amplify further through knowledge sharing as well as opportunities for advocacy at key events such as climate dialogues e.g. COPs, Community Based Adaptation events. Ground-up design and implementation of climate action is strongly aligned with the principles of Locally-led Adaptation which will empower children as key stakeholders in decision-making and taking climate action.

### 3.10.4 Needs of recipient

As an LDC, South Sudan is recognised as being particularly vulnerable to economic shocks while having urgent and immediate adaptation needs. South Sudan is ranked by the ND-GAIN (2021) as the 8<sup>th</sup> most vulnerable country in the world to climate shocks, and the 175<sup>th</sup> most ready country to adapt to the impacts of climate change. South Sudan is also close to the bottom of all countries in terms of Human Development, ranking 185<sup>th</sup> out of 189 countries on the Human Development Index and with an

estimated 80% of the population live beneath the absolute poverty line.<sup>302</sup> Conflict is also still extremely prevalent in South Sudan, and is a core driver of humanitarian needs. There are an estimated 4.3 million displaced people, comprising 2.02 million IDPs, and 2.3 million refugees in neighbouring countries of Uganda, Ethiopia, Kenya, Sudan and the Democratic Republic of the Congo.<sup>303</sup>

This project focuses on adaptation in six counties which all experience a range of climate change impacts and shocks such as extreme flooding, drought, temperature-related wildfires and heatwaves which render learners unable to go to school. South Sudan's topographic context – extreme lowlands and swamps – mean that schools and communities are extremely vulnerable to flooding. This is growing increasingly worse due to erratic and intense rainfall, requiring hundreds of schools across the country to close and leaving school buildings damaged beyond repair. Activities addressing DRR and emergency preparedness at both state, and school levels, will allow the country to effectively prepare for the increasingly severe impacts of flooding and drought, with plans in place to adapt to the worst impacts. At an institutional level, BRACE in South Sudan has been carefully designed to strengthen the capacities of all levels for locally led climate change adaptation working hand in hand with schools, CBOs, NGOs and national and state government to strengthen capacities for implementation.

#### 3.10.5 Country ownership

BRACE in South Sudan is strongly aligned and contributes to the country's national development, climate and educational policies, frameworks and governance and wider economic, gender and social frameworks and priorities. This includes the Education Sector Plan, South Sudan General Education Policy 2017-2027, as well as several areas within the NDC and the MHADM Strategic Plan 2018-2020.

Country ownership has been ensured through extensive, comprehensive, and meaningful consultation through the project development phase, with a diverse set of stakeholders including: national to sub-national levels of governments across ministries, research institutes, synergistic projects, NGOs, bilateral and multilateral donors, GPE, UNESCO and school community members (students, teachers, committee heads).

#### 3.10.6 Efficiency and effectiveness

The costs of implementation in South Sudan are higher based on security needs and logistics required to support projects, especially in rural locations. However, the South Sudan Government will draw on past experiences in implementing similar projects, including climate resilience building projects, and meeting best practices (including GCF requirements and GCF's shared learnings). It will also draw on efficiencies from the GPE and Save the Children International and available resources, as well as the AE's track record in delivering large scale GCF projects.

#### 3.11 Sustainability and exit strategy

Project strategies and activities include a strong focus on sustaining and continuing results and benefits beyond the implementation period, supporting long-term, local ownership and ensuring the replicability of the model beyond the project's duration. Key elements of the BRACE exit strategy in South Sudan include:

- Embedding project structures to coordinate with and work through local government, authority and governance structures, as well as working through four national NGOs and CBOs. This creates a foundation for locally-owned, locally-led adaptation and the capacity for scaling projects and best practices beyond the BRACE target schools and counties

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<sup>302</sup> Relief web, [South Sudan Unified Plan - Mid-year report 2023](#), accessed 29/07/2023

<sup>303</sup> Ibid

- Intensive coaching, training, and mentoring of national GoSS officials at national, state, and county level so they are equipped with knowledge, resources, and skills to implement climate change adaptation action at sub-national levels. This will include support to MoGEI as an implementing partner, and the Ministry of Environment and Forestry as NDA on climate-resilient practices
- Training of 4 national NGOs and equipping them with the management skills, planning, monitoring, reporting, and technical skills to support locally-owned, locally-led climate change adaptation beyond the life of the project
- Implementing school-level training activities through a ToT approach, ensuring knowledge is embedded in the national system and the master trainers will be capacitated to deliver future training under new climate-resilient education projects
- Ensuring infrastructure investments are installed or implemented in partnership with community-level stakeholders, with clear focal points within schools or wider communities to oversee maintenance of equipment, and providing contact points for repair or rehabilitation of new structures.

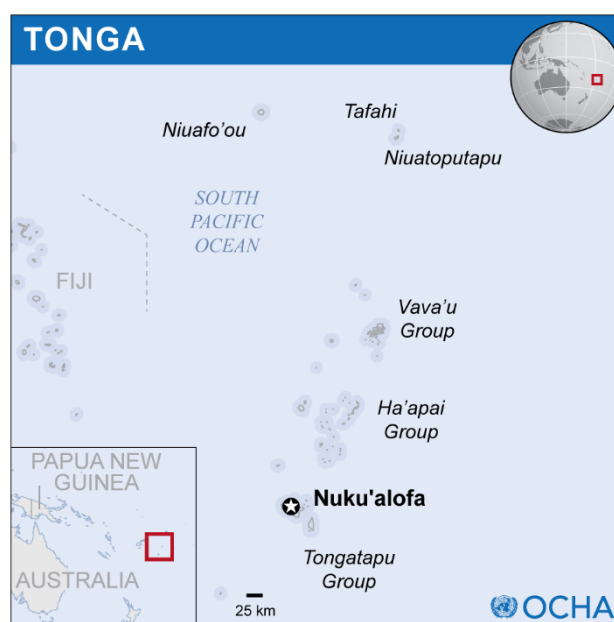
To ensure project benefits are captured and lessons learned, BRACE in South Sudan includes a focus on monitoring, evaluation, and knowledge sharing of best practices. The project will feed back to subnational and national agencies on the continued gaps, needs, and opportunities in activity implementation for uptake into revised policies, processes and plans both in the education sector, and within the National Adaptation Program of Actions, and the NDCs. Knowledge sharing in South Sudan and internationally will also be facilitated by Save the Children's networks.

## 4. Component 1: Tonga

### 4.1 Country Context

#### 4.1.1 Geography, demography, socio-economic context

Located in the Central South Pacific Ocean, the Kingdom of Tonga is an archipelago in Polynesia of 176 coral and volcanic islands scattered over 747km<sup>2</sup>.<sup>304</sup> In total, 36 islands are inhabited and the largest island, Tongatapu, covers about 260 km<sup>2</sup> and hosts 70% of Tonga's population.<sup>305</sup> Tonga's total population is approximately 100,179



Map Sources: UNCS, ESRI.  
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Map created in Sep 2013.

<sup>304</sup> Country information from government of Tonga. Available [here](#). Country information on Tonga from United Nations. Available [here](#). World Bank and Asian Development Bank (2021) *Climate risk country profile: Tonga*. Available [here](#).

<sup>305</sup> Chapter 14 Tonga. Pacific Community (SPC) (2022) *Climate Change in the Pacific 2022: Historical and Recent Variability, Extremes and Change*. Available [here](#).



people.<sup>306</sup> The country is predominantly rural, with only 25% of the population living in urban areas.<sup>307</sup> Life expectancy at birth is 71 years.<sup>308</sup>

Tonga is situated at the subduction zone of the India-Australian and the Pacific tectonic plates and lies on the Pacific Ring of Fire,<sup>309</sup> resulting in intense seismic activities. Most of the islands are comparatively flat except for those raised by tectonic actions. Many islands are low lying, in particular heavily populated areas,<sup>310</sup> leaving Tonga very exposed to natural and climate-induced hazards (including droughts, cyclones, localized flooding, and sea level rise) and geophysical hazards (including earthquakes, volcanic activity, and tsunamis).

Tonga's climate is tropical and is defined by a wet season from November to April with moderate and variable rainfall, and a dry season from May to October.<sup>311</sup> Tonga's climate is influenced by various factors including trade winds and the movement of the South Pacific Convergence Zone (SPCZ) and El Niño Southern Oscillation (ENSO). Tonga is one of the most vulnerable countries in the world to climate change due to its geographic location, status as a Small Island Developing State (SIDS), and the importance of natural resources to its main economic sectors of fisheries. Tonga's main climate change stressors are sea level rise, changing precipitation leading to droughts and flooding, tropical cyclones, heatwaves and natural degradation and biodiversity loss (for more information see section below on climate context).

Tonga is a constitutional monarchy and maintained its independence from colonial powers.<sup>312</sup> Tonga has a mixed record on promoting gender equality and two out of three women report experiencing gender-based violence.<sup>313</sup> It is an upper middle-income country, where rates of poverty and inequality are rising amongst the most vulnerable groups. An estimated 50% of all Tongans live overseas and their remittances represent approximately 50-60% of gross national domestic income.<sup>314</sup> Besides remittances, Tonga is reliant on development assistance, foreign aid, and loans. Tonga's economy is highly dependent on climate sensitive sectors such as agriculture, fisheries, and tourism and a limited natural resource base that is sensitive to external shocks.<sup>315</sup> The service sector contributes to 54.5% of Tonga's Gross Domestic Product (GDP), agriculture contributes 14.7% to GDP and fishing contributes 15.6%.<sup>316</sup> Increased market production and export of fruit and vegetables including the main crop squash, as well as kava, yams, and sweet potatoes contribute to the increasing value of agriculture. The agricultural sector supports most of the population for substance and for cash incomes, employing a third of the labour force and accounting for at least 50% of export earnings. The gross-value-added of fishing activities increased from 7.4% of GDP to 15.6%, largely as a result of increasing exports which includes prepared and preserved fish and seaweed. Due to climate-related and geophysical disasters, Tonga is at risk of losing more than 10% of its GDP annually.<sup>317</sup> In recent years, Tonga was hard-hit by several economic, natural, and climate-related shocks, which have eroded its fiscal buffers and capacity to respond to further shocks.<sup>318</sup> A key example is tropical cyclone Gita (February 2018), category 4, which caused damage of an estimated value of approximately USD 356.1 million (37.8% of Tonga's

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<sup>306</sup> Government of Tonga. (2021) Population and Housing Factsheet. Available [here](#).

<sup>307</sup> Country information on Tonga from United Nations. Available [here](#).

<sup>308</sup> World Bank Data. Available [here](#) (accessed June 2<sup>nd</sup> 2023)

<sup>309</sup> Country information on Tonga from United Nations. Available [here](#). And World Bank and Asian Development Bank (2021) *Climate risk country profile: Tonga*. Available [here](#).

<sup>310</sup> Tonga Strategic Development Framework 2015-2025. Available [here](#)

<sup>311</sup> Ibid.

<sup>312</sup> Country information on Tonga from United Nations. Available [here](#).

<sup>313</sup> Coram International (2021) *Situation Analysis of Children in the Pacific Island Countries*. UNICEF Pacific.

<sup>314</sup> World Bank and Asian Development Bank (2021) *Climate risk country profile: Tonga*. Available [here](#).

<sup>315</sup> Ibid.

<sup>316</sup> Ibid.

<sup>317</sup> DFAT Pacific Risk Profile. Available [here](#).

<sup>318</sup> World Bank (2021). Project appraisal document on for Tonga Safe and resilient schools Project. Available [here](#).

GDP).<sup>319</sup> More recently, and while the country was still recovering from the impact of cyclone Gita, cyclone Harold struck on 9 April 2020, resulting in significant damages and losses totalling at least 12 percent of Tonga's GDP. The global financial crisis, the Covid-19 pandemic, the Hunga Tonga-Hunga Ha'apai eruption, and drought in Tongatapu and 'Eua in 2023 led to additional unprecedented adverse social and economic impacts.<sup>320</sup>

Tonga's education is delivered by the Ministry of Education and Training (MET) in partnership with non-government Managing Authorities, predominantly churches. The school age population in Tonga is 36,008 (17,348 female) aged 4 to 18 years. Access to education is high, especially for primary education (96%). However, less than half of Early Childhood Education (ECE) aged children have access to pre-primary education. Climate change impacts severely impact Tonga's children and their opportunity to learn, (via deaths and injuries, psychosocial harm/mental distress, damage to school infrastructure, facilities and materials and educational disruption) and indirectly (via an increase in absenteeism, drop-outs and negative impacts on families' livelihoods, food security, health, and income as well as the wellbeing and security of children). For example, in 2018, tropical cyclone Gita damaged 109 out of the 150 schools (72% of all schools) on the main island of Tongatapu and left around 23,000 children without education.<sup>321</sup>

#### 4.1.2 Policy Landscape

Tonga has a number of policies, strategies, plans, and frameworks with which the BRACE project is aligned. These are described below.

##### Strategic Development Framework 2015-2025

The Tonga Strategic Development Framework (TSDF) II 2015-2025 "Builds on the development and lessons learnt from TSDF I as well as an increasing understanding of future uncertainties and risks"<sup>322</sup> and recognises the country's vulnerability to climate-related and natural hazards. It states "Building greater resilience to existing extreme natural events and the threat of climate change is essential if we are to ensure the sustainable progress we desire"<sup>323</sup>. Its moto is "*A more progressive Tonga supporting a higher quality of life for all*" is to be implemented through 7 outcomes and 29 organisational outcomes. Three of these outcomes listed below are relevant to this project as they focus on climate resilience, safe infrastructure, and education.

- *A more inclusive, sustainable, and effective land administration, environment management, and resilience to climate and risk.* This builds on organisational outcome 5.3: *Improved national and community resilience to the potential disruption and damage to wellbeing, growth and development from extreme natural events and climate change, including extreme weather, climate and ocean events, with a particular focus on the likely increase in such event with climate change.*
- *A more inclusive sustainable and successful provision and maintenance of infrastructure and technology.* This builds on organisational outcome 4.4: *More reliable, safe and affordable buildings and other structures, taking greater account of local conditions, helping to lower construction maintenance and operating costs, increase resilience to disasters, improve the quality of services provided and facilitate increased access* and organisational outcome 4.2: *More reliable, safe, affordable and widely available energy services built on an appropriate energy mix moving towards increased use of renewable energy.*

<sup>319</sup> World Bank (2020) *Stronger schools and Brighter futures for Tonga*. Available [here](#).

<sup>320</sup> World Bank and Asian Development Bank (2021) *Climate risk country profile: Tonga*. Available [here](#).

<sup>321</sup> Plan Australia (2023) *From Crisis to Classroom*. Available [here](#). And World Bank (2020) *Stronger schools and brighter futures in Tonga*. Available [here](#).

<sup>322</sup> Tonga Strategic Development Framework II. Available [here](#)

<sup>323</sup> Ibid. p. 13.

- *A more inclusive, sustainable and dynamic knowledge-based economy. This builds on organisational outcome 2.4: Improved educational and training which encourages life-long learning of both academic and vocational knowledge by all people, so better equipping us to make active use of the opportunities in the community, the domestic economy, and overseas.*

## **Climate Change Policy**

In 2016, the country endorsed Tonga Climate Change Policy: A Resilient Tonga by 2035<sup>324</sup>, replacing the first Tonga Climate Change Policy that was developed in 2006. In this policy, Tonga acknowledges that as a SIDS, Tonga “Is extremely vulnerable to the adverse impacts of climate change and disaster risks” and therefore prioritises climate resilience. The policy vision is “*A resilient Tonga to the impacts of climate change and climate-related disaster risks to protect and safeguard the country for the present and future generations*” and its goal is “*to achieve the vision of a Resilient Tonga by 2035*”. The vision sets 20 targets and 4 are related to BRACE:

3. Resilient homes, schools, and community halls (i.e. incorporating design for category 5 cyclones)
5. 100 percent renewable energy
12. All families and communities understand climate change and the need for disaster preparedness and have taken action to be resilient
16. Education for resilience is incorporated into curricula at all levels of primary, secondary and tertiary education.

## **Joint National Action Plan for Climate Change Adaptation and Disaster Risk Reduction (JNAP)**

The first JNAP was endorsed in 2010, being the first of its kind in the Pacific Islands region. It emphasized the need to build climate resilience and work collaboratively across government and society to combat climate change and reduce the risks of disasters.

The second Joint National Action Plan on Climate Change and Disaster Risk Management (JNAP II) 2018-2028 was published in 2018 and goes hand-in-hand with the climate change policy as it details how these objectives will be met. It recognises climate change as “The single biggest issue that will determine the future of Tonga over the coming decades”<sup>325</sup>. Similar to the climate change policy there is a focus on incorporation of education for resilience to climate change and natural hazards into curricula at all levels of primary, secondary, and tertiary education, resilient public and community infrastructures such as schools, strengthening of climate services and early warning systems (EWS) and renewable energy infrastructure.<sup>326</sup> By embedding these topics into the school curriculum, the Government seeks to foster a generation that is not only aware of the impacts of climate change but also prepared to contribute to building a more resilient Tonga. BRACE aims to reinforce and strengthen the foundations for the achievement of key national outcomes under JNAP II and TSDF II.

## **Nationally Determined Contribution and Third National Communication on Climate Change.**

Tonga’s second Nationally Determined Contribution (NDC) acknowledges that “Tonga is one of the most vulnerable countries in the world to climate change due to its geographic location, status as a

<sup>324</sup> Government of Tonga (2016). Tonga Climate Change Policy: A resilient Tonga by 2035. Available [here](#)

<sup>325</sup> Government of Tonga (2018) *Joint National Action Plan 2 for Climate Change Adaptation and Disaster Risk Management*. p. viii. Available [here](#).

<sup>326</sup> Government of Tonga (2018) *Joint National Action Plan 2 for Climate Change Adaptation and Disaster Risk Management*. p. viii and 26. Available [here](#). And MEI/DECC (2016) *Tonga Climate Change Policy – A resilient Tonga by 2035*. Available [here](#).

SIDS and the importance of natural resources to its main economic sectors of fisheries”. The NDC’s adaptation targets focuses on 30% of land being utilised for agroforestry or forestry, prevention of loss of land to rising sea levels, and maintenance of the existing stock of fish and other marine species. The NDC also acknowledges that Tonga makes “A negligible contribution to global GHG emissions”.<sup>327</sup> According to Tonga’s Third National Communication on Climate Change<sup>328</sup> of 2019, Tonga emitted a total of 310.4 Gg of CO<sub>2</sub>-equivalent in 2006. It elaborates on how Tonga largely depends on the natural resources that are a source of living of people of Tonga, expanding on forestry, water resources, agriculture, and fisheries.

### **GCF Tonga Country Programme**

Tonga’s Country Programme<sup>329</sup> was prepared under the direction of the National Designated Authority (NDA) for the GCF, the Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC). The Country Programme priorities were built on stakeholder consultations as well as key policies and strategic frameworks, including Tonga National Strategic Development Framework (2015-2025), the National Climate Change Policy (2016), the Second Joint National Action Plan on Climate Change and Disaster Risk Management (JNAP 2), (2018 – 2028), the Tonga Nationally Determined Contribution (NDC) and the Energy Road Map. The BRACE project will contribute to the following identified priorities:

- Climate Proof of Infrastructures (output 1.2)
- Renewable Energy (output 1.2)
- Sustainable Financing for Resilient Building (output 1.2)
- Preparedness and Response capacity (output 1.3)

### **Tonga Emergency Management Act and Strategic Roadmap for Emergency and Disaster Risk Management**

The National Emergency Management Office (NEMO) was established under the Emergency Management ACT 2007.<sup>330</sup> Its vision is “*Safer and more resilient community to effects of natural hazards and climate change induced events*”. Tonga Strategic Roadmap for Emergency and Disaster Risk Management 2021-2023<sup>331</sup> is a joint product of NEMO and National Emergency stakeholders. It is aligned with the TSDF 2015-2025, especially the following outcome: “*A more inclusive, sustainable and effective land and environment management, with resilience to climate change and risk*”. The Roadmap aims to enhance dialogue, communication and shared commitment across the sector, facilitate coordinated planning and monitoring of progress, and support coordinated action towards a more effective sector. In 2022, NEMO established a new national coordination structure, in which the MET is the national cluster lead for education. In 2024, NEMO changed its name to National Disaster Management Office (NDRMO).

### **Education Act, Tonga Education Policy and other educational policies**

Tonga Education Policy Framework (TEPF)<sup>332</sup> describes the long-term vision of the education sector. The TEPF covered the period of 2004-2019 and was recently reviewed. BRACE is aligned to TEPF’s goals focusing on ensuring access to and quality to education and to cater for different abilities and needs of students. School safety and climate resilient education is a priority within the TEPF.

<sup>327</sup> Government of Tonga (2020) Tonga’s Second Nationally Determined Contribution. p. viii. Available [here](#)

<sup>328</sup> Government of Tonga (2019) *Third National Communication*. Available [here](#).

<sup>329</sup> Tonga Country Programme (2018) Available [here](#)

<sup>330</sup> Government of Tonga. About NEMO, Available [here](#)

<sup>331</sup> Government of Tonga (2021) Tonga Strategic Emergency and Disaster Risk Management Roadmap (2021 - 2023). Available [here](#)

<sup>332</sup> Government of Tonga (2004) Available [here](#)

Tonga's main education sector legislation is the Education Act 2013 (amended in 2020)<sup>333</sup>. The act defines the structure of the education sector and outlines the responsibilities of the Minister, MET, and education authorities. This includes the responsibilities around a natural, or climate-related disasters. The Education Act explicitly prohibits corporal punishment in both schools and pre-schools, reinforcing the commitment to creating a safe and nurturing learning environment for all children. Additionally, the Act includes a non-discrimination provision that protects children with disabilities, ensuring they have equal access to education. The Act also mandates that schools must comply with water, sanitation, and hygiene (WASH) standards as established by the Ministry, recognizing the critical role of a healthy school environment in the overall well-being and educational success of children.

The severe impact of climate-related and non-climate related hazards is acknowledged in TEPF, the Education Act, and the Education Sector Analysis (ESA)<sup>334</sup>. The ESA specifically mentions the need for retrofitting infrastructure, provide remote learning and improve school safety; a need which will be fulfilled by BRACE and other existing projects.

Tonga also has the Minimum Service Standards for Schools (MSS) developed in 2006. The MSS provides critical guidance to schools on the establishment, maintenance, and implementation of safer schools. However, MSS need revision to remove duplication of standards specified in other documents (including the Standard School Designs which is in line with National Building Standards), increase clarity on the definition of school safety, and include recommendations to apply an all-hazards approach and lens to school safety. In its retrofitting efforts, BRACE will build on the MSS and National Building Standards and coordinate with the MET and the Ministry of Infrastructure as well as the Pacific Resilience Program: Tonga Safe and Resilient Schools Project (TSRSP)<sup>335</sup> to ensure that it complies with building standards as well as best practices and lessons learned on school infrastructural improvements.

In terms of school safety, there is no comprehensive school safety policy, but Climate Change and Disaster Risk Reduction is covered under the JNAP II. This aims to develop a resilient Tonga through an inclusive partnership based on good governance and building knowledgeable and proactive communities to support a strong development pathway.

Whilst explicit adoption of the Comprehensive School Safety Framework (CSSF) has not yet occurred, significant steps taken in school safety policy implementation, with an implicit all-hazards approach include:

- Established of the Safe School Environments unit (previously known as Emergency Unit) with the MET to lead both school safety and education in emergencies activities and strategies
- Revamping the education cluster to lead coordination of all school safety and education in emergencies activities including Disaster Risk Reduction (DRR) and preparedness for climate induced disasters
- Co-development and adoption of the Tonga School Safety Handbook, training programme in phases with support from both UNICEF and Save the Children
- Current development of annual School Safety Self-Assessment Digital Toolset to provide ongoing data and evidence for planning and decision-making at all levels.

Finally, the Ministry is currently updating its Curriculum Framework (2008). Building on this framework and coordinating with TSRSP's work on updating Tonga's curriculum with aim to mainstream climate

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<sup>333</sup> Government of Tonga (2020) Available [here](#)

<sup>334</sup> Ministry of Education and Training (2023) *Education Sector Analysis*.

<sup>335</sup> World Bank. Tonga Safe and Resilient Schools Project. Available [here](#). And World Bank (2022) US\$19 Million for Safer Schools and Improved Emergency Early Warning Systems in Tonga. Available [here](#).

change topics within all subjects taught at all levels of education. BRACE will develop a climate change elective for the last two years of secondary education and will strengthen accessibility to climate change education through an e-learning platform called HAMA e-learning platform. This platform was developed in 2021 to ensure continuity of learning during disasters as well as ensure education sector resilience.

Other national policies and standards include:

- National Assessment and Examination Framework (2022)
- TVET Policy Framework (2020-2025)
- Teacher Education and Registration Policy (2021)
- National Inclusive Education Policy (2007, currently being updated)
- Induction Policy (2021)
- Language Policy (2008)
- School Food Policy (2020-2025)
- Staff Transfer Policy (2022)
- Housing Policy (2020)
- Bullying Policy (2020)
- Primary School Principal's Handbook

Currently, the MET does not have a Gender Equity Policy.

#### **Family Protection Act 2016:**

The revised Family Protection Act of 2016 is designed to safeguard all individuals, including children, from domestic violence. It provides a legal framework for protection orders and other measures to ensure the safety of victims, particularly focusing on those who are most vulnerable, such as children who experience or witness violence within the home. This Act also includes provisions for the immediate removal of perpetrators from homes and emphasizes the importance of protecting the well-being and rights of children in domestic situations.

#### **Tonga National Youth Policy & Strategic Plan of Action**

The National Youth Policy and Strategic Plan of Action of 2015, revised in 2021, emphasizes the incorporation of mental, emotional, and physical health education into school curricula. This approach ensures that young people in Tonga receive comprehensive health education, which is crucial for their development and well-being.

#### **National Child Protection Policy**

Although the National Child Protection Policy has been drafted in 2022 and is awaiting endorsement, it represents a significant step towards a more structured and systematic approach to child protection in Tonga. The policy is expected to provide clear guidelines and frameworks for preventing and responding to child abuse, neglect, and exploitation. Once endorsed, it will strengthen the legal and institutional framework for child protection, ensuring that the rights and welfare of children are prioritized across all sectors.

#### **National Women's Empowerment and Gender Equality Tonga Policy and Strategic Plan of Action 2019-2025**



The National Women’s Empowerment and Gender Equality Tonga Policy and Strategic Plan of Action 2019-2025<sup>336</sup> fifth outcome is to “Create equal conditions to respond to natural disasters, environmental challenges and climate change”, focusing on improved knowledge about gender perspectives in response to climate change adaptation (CCA) and increasing the capacity of households to respond to the impacts of natural disasters, environmental challenges, and climate change.

#### 4.1.3 Legal and regulatory landscape – national, provincial, area council, community/school level

Internationally, Tonga is signatory to several treaties and agreements that hold obligations to stabilise greenhouse gas emissions and support ongoing CCA, including the United National Framework Convention on Climate Change (UNFCCC). Tonga ratified the UNFCCC in 1998, Sendai Framework for Disaster Risk Reduction in 2015, the Paris Agreement in 2016<sup>337</sup> and the Kyoto Protocol in 2008 and the Doha amendments to the Kyoto Protocol in 2018.

##### **National level**

Tonga is a constitutional monarchy assisted by a privy council comprised of ministers and the governors of Ha’apai and Vava’u divisions.<sup>338</sup> The cabinet is responsible for the overall administration of government at both national and local level.

The Government of Tonga has recognized the importance of building resilience within the education sector, including through the prioritisation of future investment that is resilient to existing and future climate and disaster hazards.<sup>339</sup> At national level, Tonga has two ministries that are essential to this project: the MET and MEIDECC. The CEO of the MEIDECC is the NDA. Both Ministries are guided by Tonga’s Strategic Development Framework 2015-2025 (see 1.2). Additional to these ministries the BRACE team will coordinate with the Ministry of Infrastructure with regards to output 1.2.

##### ***Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC)***

MEIDECC comprises the following departments; corporate service department, meteorology department, energy department, disaster management department, environment department, climate change department, communication department and a CERT/E-Government Department.<sup>340</sup> The BRACE team will work closely with the department of climate change and coordinate with the department of energy for output 1.2.

The Department of Climate Change in the MEIDECC was established to address the impacts of climate change on Tonga and provide an effective system to facilitate climate change adaptation and mitigation and the phasing out of ozone depleting substances<sup>341</sup>. Their vision is *‘A Tonga that is resilient to the impacts of Climate Change and disaster risks and is able to protect and safeguard its present and future citizens’*. Its mission is *‘To develop a resilient Tonga through an inclusive participatory approach that is based on good governance, builds knowledgeable, proactive communities and support a strong, sustainable development pathway’*. Its goal is *‘To achieve the vision of a resilient Tonga by 2035’*.<sup>342</sup> The MEIDECC is guided by Tonga’s Climate Change Policy and JNAP II.

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<sup>336</sup> Government of Tonga (2019) National Women’s Empowerment and Gender Equality Tonga Policy and Strategic Plan of Action 2019-2025. Available [here](#).

<sup>337</sup> Government of Tonga (2020) Tonga’s Second Nationally Determined Contribution. p. iii. Available [here](#)

<sup>338</sup> [Tonga.pdf \(clgf.org.uk\)](#)

<sup>339</sup> World Bank (2021). Project appraisal document on for Tonga Safe and resilient schools Project. Available [here](#).

<sup>340</sup> MEIDECC. 2022. Corporate Plan and Budget 2019/20 -2021-22. Available [here](#)

<sup>341</sup> Government of Tonga. Department of Climate Change – MEIDECC. Available [here](#)

<sup>342</sup> Ibid.



### **Ministry of Education and Training**

The MET is responsible for basic, secondary, and post-secondary education and its functions include provision of qualified and registered teachers, inspection, and national standards, developing curriculum, examinations and assessments, licensing schools, maintenance and assets of government schools, and the development of the Education Management Information Systems (EMIS) and other data systems.<sup>343</sup> The MET is also responsible for coordination with non-government education systems and development partners. This includes registering and monitoring non-government education authorities and providing school grants. The pay and conditions for the public sector teachers is managed by the Public Service Commission (PSC).

Registered non-government providers are known as Managing Authorities under the Education Act. These include church and privately-run schools and systems.<sup>344</sup> Each authority is responsible for the management and organisation of their schools including appointment of teachers and the enrolment and suspension of students. The registered non-government Managing Authorities have full authority to manage their schools using their own governance mechanisms. However, the establishment of a new school requires the permission of the Minister. The MET, with due notice to the Managing Authority, may visit, inspect, or appraise any school or teacher and non-government schools are expected to provide regular data. The authorities should also provide the MET with data from time to time, however, the TEPF review found there was a lack of accurate or timely data and very little public reporting on the progress and work of the non-government schools.

The Education Act established an Advisory Council for Education as a consultative body appointed by the Minister to advise them on education policy and planning, education provision, proposed legislation, and other educational matters. The Tonga National Qualifications and Accreditation Board (TNQAB) consists of a Board of Directors appointed for a three-year term by the Minister for Education and Training, with the consent of Cabinet. The directors are drawn from relevant government ministries, non-government education systems and industry.

The TNQAB has the authority to register post-secondary institutions, accredit courses and provide quality assurance to ensure institutions follow its published regulations and standards for the Tonga Qualification Framework.

A number of education coordination mechanisms exist in Tonga. The MET CEO is participating in regularly scheduled meetings with the Managing Authorities known as the Tonga Council of Directors of Education Systems (TCDES). The TCDES members are also included in the recently formed Local Education Group (LEG), chaired by the CEO for Education and Training. As part of the activities supported by the Global Partnership for Education (GPE) System Capacity Grant, MET plans to hold periodic Joint Sector Reviews which will enhance sector coordination, communication and joint action by all education stakeholders. Tonga also has an education cluster that meets quarterly and is responsible for disaster risk reduction, school safety and emergency response.

### **Provincial and local level**

Tonga consists of five main island groups also signaling the five administrative divisions. Tongatapu and 'Eua in the South, Ha'apai in the middle, Vava'u in the North and the Niuas (Niuafu'ou and Niuatoputapu) in the far North. Each of these administrative divisions is further divided into 23 further districts.

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<sup>343</sup> Ministry of Education and Training (2023) *Education Sector Analysis*.

<sup>344</sup> Ministry of Education and Training (2023) *Education Sector Analysis*.

Tonga has a form of local government which features district and town officers elected every three years in local elections. There is no constitutional provision for local government and the main legislative texts that cover local government are the Fonos Act 1988 and the District and Town Officers Act 1988 (revised in 2020).<sup>345346</sup> According to these acts, district and town officers are required to submit regular reports to the Ministry of Internal Affairs on village and district activities, and to organise village or provincial meetings.<sup>347</sup> They are also tasked with attending official and ceremonial government functions. In some villages councils have been established to discuss matters of priority and to assist the town and district officers in the development of village life.

The 23 district officers and 156 town officers are elected by popular vote each 3 years and report directly to the Prime Minister's Office, or the governor in the case of Ha'apai and Vava'u divisions. Following the 2016 local elections, 1.1% of local government officers were women. The town officers are empowered to call a normal "fono", referring to a community meeting to discuss matters of priority, as well as a "grand fono" where the Minister of Internal Affairs or other government officials may address the people.

The district officers have duties around public health, agriculture, and finance, as well as some general duties as prescribed by the law and report to the police breaches of the law.<sup>348</sup> The town officers are responsible for public health, agriculture, sudden deaths, fonos and supporting district officers in general matters.

The distribution of officers and population can be seen in the Table below.

***Distribution of officers and population***<sup>349</sup>

| Division     | District officers | Town officers | Village (uninhabited) | Population (2016 Census) | Population (2018 est.) | % rural (2010) |
|--------------|-------------------|---------------|-----------------------|--------------------------|------------------------|----------------|
| Tongatapu    | 7                 | 62            | 71 (4)                | 74,679                   | na                     | na             |
| Vava'u       | 6                 | 39            | 45 (2)                | 13,740                   | na                     | na             |
| Ha'apai      | 6                 | 28            | 28 (1)                | 6,144                    | na                     | na             |
| 'Eua         | 2                 | 15            | 14 (0)                | 4,950                    | na                     | na             |
| Ongo Niua    | 2                 | 12            | 12 (0)                | 1,232                    | na                     | na             |
| <b>TOTAL</b> | <b>23</b>         | <b>156</b>    | <b>170 (7)</b>        | <b>100,745</b>           | <b>99,740</b>          | <b>76.5</b>    |

#### 4.1.4 Education sector overview

Education in Tonga is delivered by the MET in partnership with non-government Managing Authorities, predominantly churches. Together these form the Tonga Education systems. There are 106 early childhood education (ECE) centers, 130 primary schools and 88 secondary schools.<sup>350</sup> The majority of teachers in the primary and secondary system are qualified, however, the ECE sector still employs paraprofessionals, with only 54.5% qualified teachers in comparison to 97.9% in primary schools. The

<sup>345</sup> [Tonga.pdf \(clgf.org.uk\)](#)

<sup>346</sup> Government of Tonga (2020) District and Town Officers Act 1988 (revised 2020). Available [here](#)

<sup>347</sup> [Tonga.pdf \(clgf.org.uk\)](#)

<sup>348</sup> Government of Tonga (2020) District and Town Officers Act 1988 (revised 2020). Available [here](#)

<sup>349</sup> [Tonga.pdf \(clgf.org.uk\)](#)

<sup>350</sup> Ministry of Education and Training (2023) *Education Sector Analysis*.

school age population in Tonga is 36,008 (17,348 female) aged 4 to 18 years. Access to education is high, especially for primary education (96%). However, less than half of ECE-aged children have access to pre-primary education. The transition rate from primary to lower secondary education is high but lower for transition to upper secondary (65% enrolment), especially for boys and students from the poorest households. Post-secondary technical and vocational education and training (TVET) is dominated by male students whereas higher education students are predominantly female.

The majority of the schools are on the main Island of Tongatapu. There are challenges in ensuring access to quality education in many small or remote schools in the outer islands, due to physical access and electricity issues. The outer islands are also inhabited with a larger proportion of low-income households which increases vulnerability during education disruption. In terms of foundational reading and numeracy, Tongan students performed well in comparison to the regional average in the recent Pacific Islands Literacy and Numeracy Assessment (PILNA). However, there are concerns especially on foundational reading and learning: only 47% of children in year 4 were meeting minimum standards for reading in comparison to 75% meeting minimum standards in numeracy. In addition, there is also concern around performance in mathematics and science in secondary school.<sup>351</sup>

The Government of Tonga share of spending on education has hovered around 15-20% of total government expenditure for several years (similar to neighbouring countries).<sup>352</sup> Spending has remained relatively stable, with around 75% for recurrent expenditure and 25% for development spending.

### **Educational policies, strategies and plans**

In terms of school safety, there is no comprehensive school safety policy, but climate change and DRR is covered under the JNAP II, which aims to develop a resilient Tonga through an inclusive partnership based on good governance and building knowledgeable and proactive communities to support a strong development pathway. Tonga also has the MSS developed in 2006. The MSS provides critical guidance to schools on the establishment, maintenance and implementation of safer schools. However, MSS needs revision to remove duplication of standards specified in other documents (including the Standard School Designs which is in line with National Building Standards), increase clarity on the definition of school safety and include recommendations to apply an all-hazards approach/lens to school safety.

Whilst explicit adoption of the CSSF not yet occurred, significant steps taken in school safety policy implementation, with an implicit *all-hazards* approach include:

- Co-development and adoption of the Tonga School Safety Handbook, training programme in phases with support from both UNICEF and Save the Children
- Current development of annual School Safety Self-Assessment Digital Toolset to provide ongoing data and evidence for planning and decision-making at all levels.

The MET has a disaster response and recovery system led by the Safe Education Environment Unit which liaises with the NDRMO (previously NEMO) and the Education Cluster during emergencies. The MET maintains pre-positioned materials in warehouses in each district and provides free access to video and audio lessons for home learning via the Hama E-Learning Platform (HeLP). Through GPE accelerated funding, the content on the HeLP is being expanded to cover more learning days, and more curriculum topics to ensure that in the event of education disruption children can continue learning,

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<sup>351</sup> Educational Quality and Assessment Programme (EQAP) of the Pacific Community (SPC) (2021) Pacific Islands Numeracy and Literacy Assessment Report (PILNA).

<sup>352</sup> World Bank (2021). Project appraisal document on for Tonga Safe and resilient schools Project. Available [here](#).

including offline access via RACHEL boxes<sup>353</sup>. Content for parents to support children's learning at home during school closures is also being added. The HeLP is one of the key tools in ensuring education resilience and continuity.

With support from UNICEF, the MET has access to the RapidPro system for rapid disaster assessments. Under the new Corporate Plan, the MET plans to operationalise a School Disaster Management Committee, strengthen the Education Cluster, roll out the *School Safety Handbook*, update the disaster management plan and procedures, and conduct national drills. MET is also developing an *Annual School Safety Self-Assessment* survey digital toolset for evidence-based planning and decision-making at all levels which will be integrated into the EMIS) also undergoing upgrades. The survey will cover school demographics, hazard and risk environment, school facilities, school safety management, and risk reduction and resilience education. Automated reports will be generated for schools, subnational, and national levels to allow fast decision making and will provide measures of change detection over time. The toolset will also support implementation of UNICEF's 3-star WASH in Schools programme.

### **Climate change curriculum and mainstreaming status**

With support of the World Bank through the TSRSP (see 1.5), the MET is currently updating the national curriculum to improve relevance and effectiveness. Updates will include the mainstreaming of climate sensitivity into the existing formal curriculum as well as informal (out of school) learning programmes. Child protection, psychosocial support, and psychosocial first aid topics are also included in teacher Continuous Professional Development (CPD) programmes to ensure that teachers have the capacity to support student's psycho-social and child protection needs in the aftermath of disasters (including climate-induced disasters). Non-formal experiential learning for risk reduction and resilience is beginning to take place through integration of *Standard Operating Procedures for Disasters and Emergencies in Schools*, built into the *School Safety Handbook*, and supplemented by instructional videos produced in both Tonga and Fiji.

In consultation with MET, MEIDECC, and the TSRSP team, the need to develop an elective climate change subject for the final two years of secondary school was identified and therefore integrated in BRACE project design (see activity 1.4.1 in project and programme description).

### **Key sector climate change priorities**

The education sector in Tonga is endeavouring to strengthen resilience to climate-induced and natural hazards, as well as other education disruptions. This will be strengthened by planned programmes to retrofit infrastructure, provide remote learning, and improve school safety.<sup>354</sup> School safety and climate resilient education is a priority within the TEPF and is also highlighted as a priority in the 2023 ESA. It is anticipated that it will also be a priority in the three-year MET corporate plan, making it a priority in short, medium, and long term. The ESA identifies several priority investment areas and climate change features as a priority under the access to education and system capacity priority areas. The three key priorities that relate to climate change in education are:

- Continue to retrofit and strengthen school infrastructure to reduce vulnerabilities to climate change and natural disasters
- Strengthen the data collection, analysis, and dissemination system for basic and secondary education

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<sup>353</sup> RACHEL (Remote Area Community Hotspot for Education and Learning)

<sup>354</sup> Ministry of Education and Training (2023) *Education Sector Analysis*. p. 20.

- Accelerate the programme to strengthen school infrastructure and safety systems to increase resilience to climate change and natural disasters.<sup>355</sup>

Tonga has invested in developing tools and processes for annual school safety self-assessments which facilitate the delivery of appropriate action-oriented guidance to schools for risk reduction and response-preparedness. The ongoing updates to the EMIS including the integration of the annual School Safety Self-Assessment Survey which will strengthen overall school safety and climate change adaptation plans in line with recommendations from the ESA.

Consultation between MET and Save the Children confirm that the MET also prioritises psychosocial support, and resilience and emotional wellbeing of students, teachers and parents as part of safety and resilience building, especially in the aftermath of disasters. MET is also expanding a remote learning mechanism by investing in remote learning materials, including content on HeLP, as well as expanding the number of radio lessons and printed home learning packs that can be deployed to mitigate learning disruption in the event of a disaster. MET has also recommended that investments from partners such as GPE and GCF may include actions around strengthening climate resilience of school infrastructure and WASH facilities, ensure connectivity and provision of school-tailored EWS and Climate Information Services (CIS), provision of solar energy especially for schools in remote islands, school disaster preparedness and awareness, and an climate change elective for the final two years of secondary school.

#### 4.1.5 Complementary projects and initiatives

##### **Alignment with GCF FP090 Tonga Renewable Energy Project under the GCF FP036 Pacific Islands Renewable Energy Investment Program, OIREP and other renewable projects**

In 2009, the Government of Tonga published the Tonga Energy Road Map (TERM) 2010-2020.<sup>356</sup> This roadmap is implemented in three phases: the first phase is implemented through Outer Island Renewable Energy Project (OIREP), phase two through IPP and JICA, amongst others, and phase 3 is implemented through the Tonga Renewable Energy Project (TREP).

- Phase 1 (2014-2019): The Outer Island Renewable Energy Project (OIREP), a USD 29.2 million Asian Development Bank (ADB) project focused on the following outcomes: (i) optimized use of on-grid and off-grid generation systems, and (ii) increased consumer access to electricity generated by solar power. It ran from 2014-2019 in Ha'apai, 'Eua and Vava'u and provided plants on 9 outer islands and a power distribution network upgrade.
- Phase 2 (2017-2019): included a pilot solar farm built by an independent power producer (IPP) and utility-scale wind farms funded by the Japan International Cooperation Agency (JICA) and others (USD 15-20 million). Completion was projected to take Tonga to generating about 27% of its electricity from renewables.
- Phase 3: The Tonga Renewable Energy Project (TREP)<sup>357</sup> is a USD 53.2 million GCF-funded Asian Development Bank project that aims to help Tonga move away from fossil fuels and shift to renewables (including solar, wind and biomass). The project runs from October 2018 till April 2024. This project had four outputs: 1) Battery Energy Storage Systems (BESS) on Tongatapu, 2) Grid-connected Renewable Energy Generation (small-scale solar PV plants) on 'Eua and Vava'u islands, 3) Renewable-based hybrid systems and mini-grids on outer-islands, 4) Capacity building and project management support. This project constructed two small-scale solar PV plans coupled with Battery Energy Storage System (BESS) on 'Eua and Vava'u. TREP also supports Tonga to meet its

<sup>355</sup> Ibid., p. 26 -27 and p. 164-165

<sup>356</sup> Government of Tonga (2010) Tonga Energy Road Map (TERM) 2010-2020. Available [here](#)

<sup>357</sup> Asian Development Bank (2018) GCF approved funding proposal: FP090: Tonga Renewable Energy Project under the Pacific Islands Renewable Energy Investment Program. Available [here](#)

renewable energy targets by installing BESS, subsequently enabling increased integration of intermittent renewable energy. TREP is part of GCF FP036 Pacific Islands Renewable Energy Investment Program and is the first GCF proposal to be approved in Tonga. The project proposal was approved by the GCF board in 2018 and officially launched in 2019.

Other renewable energy projects are:

- **Tonga Energy Efficiency Master Plan (TEEMP):**<sup>358</sup> the TEEMP, a Climate Technology Centre project that complements the TERM and is focused on the development of a more organised and clearer pathway for Tonga to reduce its Greenhouse Gas (GHG) emissions and increase energy saving from all sectors and investment in low carbon technologies. It also aimed to improve the Energy Efficiency standards of technologies and applications in Tonga through the development of Energy Efficiency Standards for energy services, appliances, technologies, buildings and vehicles.
- **IREOEGT**<sup>359</sup>: The principal activity of this Pacific Fund/French government funded project is having synergy experts visit Tonga to conduct an analytical study on the overall electricity generation in Tonga (on-grid and off-grid). The project will help equip locals with the knowledge in stabilising the electricity grid under high renewable energy penetration, technical and institutional set up of mini-grid and off-grid systems as well as recommendation on implementation of energy storage of wind farms for mini-grid in the outer islands.
- **Community PV Powered Water Pumping Phase IIIa [Tongatapu] (PV-PWPP) project:**<sup>360</sup> Under the Energy, Ecosystems, and Sustainable Livelihoods Initiative phase II, IUCN (funded through the government of Italy and Austria), Tonga jointly implemented the PV-PWPP. The project aims to work to low-emissions and water security. It worked together with the Tonga Energy Unit of MEI DECC to acquire 11 solar water pumps, automatic switching systems and floaters, and the installation of these systems and training of community leaders and village technicians on the maintenance of ground water pumping systems.
- **Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP):** the PIGGAREP, funded by GEF and Denmark and implemented by UNDP and SPREP support 13 remote villages in Ha'apai to increase their access to water thanks to the installation of solar powered water pumps to reduce reliance on diesel fuel for access to well water.

The BRACE design team has consulted the TREP-team and will work closely during implementation to ensure the two projects will be closely linked and mutually reinforcing. The key point of synergy between BRACE and TREP and other renewable energy projects is output 1.2 activities involving renewable energy to ensure access to and efficient utilisation of internet connectivity. BRACE will build on the expertise and advice from the TREP team around solar PV systems and BESS and will work closely with Tonga Power Limited, Tonga's national energy provider.

## GCF readiness activities

Tonga has had 12 GCF readiness activities in Tonga to date (see table below)

### Tonga GCF Readiness Proposals

| Project Title | NDA/Accredited Entity/ Delivery Partner | Status |
|---------------|---|--------|
|---------------|---|--------|

<sup>358</sup> [Microsoft Word - 3.3 TEEMP FINAL.docx \(ctc-n.org\)](#)

<sup>359</sup> [IREOEGT – tongaenergyroadmap](#)

<sup>360</sup> [Improving the sustainable use of groundwater in Tongatapu | IUCN](#)



|  |   |                                |
|--|---|--------------------------------|
| 1. NDA Strengthening and Country Programming support for Tonga through Ministry of Finance and National Planning (MFNP) – phase 1-3  | NDA                                       | Current                        |
| 2. Strategic Frameworks support for Tonga through UNEP and CTCN  | UNEP                                      | Activities in-country complete |
| 3. Strategic frameworks support for Tonga through MFNP   | NDA                                       | Activities in-country complete |
| 4. Strengthening Adaptation Planning in Tonga<br><br>Adaptation planning support for Tonga through Ministry of Finance and National Planning                                     | NDA                                       | Activities in-country complete |
| 5. Enabling Private Sector Access to Climate Finance to Strengthen Climate Resilience Development in Tonga   | Tonga Development Bank                    | Activities in-country complete |
| 6. Rapid Readiness Support for Resilient Recovery in Kingdom of Tonga  | NDA                                       | Activities in-country complete |
| 7. Enhancing Access of Civil Society Organizations (csos) and Disabled People Organizations (dpos) to Climate Finance for Building Resilience of Most Vulnerable Groups in Tonga | Ministry of Finance                       | Current                        |
| 8. Strengthening Resilience of Water Resources Sector to the Impacts of Climate Change in Tonga  | Ministry of Finance and National Planning | Current                        |

### Alignment with other projects

The development of BRACE has included a wide range of consultations with other actors in Tonga. BRACE has been designed to build on and complement a range of current and recently completed projects. It will also be implemented in complementarity with planned investments from a range of partners. A table of key investments relevant to BRACE is provided below (see table below), with information on how BRACE will be complementary, coherent, and prevent duplication.

### List of relevant projects in Tonga

| Project details  | Description   | Points of complementarity  |
|--|---|--|
| <b>Current bilateral projects</b>  |   |  |
| <b>Pacific Resilience Program: Tonga Safe and Resilient Schools Project (TSRSP)</b> <sup>361</sup><br><br>Including GPE's Multiplier Fund Grant of GPE of USD 5 million<br><br>2022-2027 | The objective of Tonga Safe and Resilient Schools Project is to enhance the safety and resilience of selected education facilities and to improve the quality of data-driven education management, curricula, and assessments in the selected educational programs. The projects comprise of four components:<br><br>i) <u>Improving safety and resilience of education facilities</u> will improve the safety and resilience of selected education facilities in Tonga and | BRACE and Tonga Safe and Resilient Schools Project (TSRSP) will be complementary as BRACE is building on World Bank's multi-hazard risk assessment of covering 1,034 schools as agreed with government and in consultation with World Bank to select sites for output 1.2. During implementation, BRACE will coordinate and align with TSRSP with regards to output 1.2 focusing on climate resilient school infrastructure and WASH facilities retrofits. BRACE will seek the advice, |

<sup>361</sup> World Bank. Tonga Safe and Resilient Schools Project. Available [here](#). And World Bank (2022) US\$19 Million for Safer Schools and Improved Emergency Early Warning Systems in Tonga. Available [here](#).



|   |  |   |
|---|--|---|
| <p>USD 29.5 Million</p> <p>World Bank</p>   | <p>contribute to the reduction of disaster and climate vulnerabilities from more frequent adverse weather events</p> <p>ii) <u>Establishment of education management information system (EMIS) and improved quality of curricula and assessment</u> will strengthen data management systems within the education system in Tonga and improve the quality of curricula and assessments</p> <p>iii) <u>Contingent emergency response component</u> is designed to provide an immediate response in an event or eligible crisis or emergency, by enabling Tonga to request the World Bank to re-allocate project funds to support emergency response and reconstruction</p> <p>iv) <u>Project management</u> objective to provide efficient and effective implementation support for the project.</p> | <p>expertise, and lessons learnt of TSRSP for the implementation of this output.</p> <p>Additionally, BRACE will also coordinate with regards to output 1.4. Building on TSRSP climate mainstreaming in primary and secondary education, BRACE will develop an elective climate change subject for the final 2 years of secondary school (Form 6/7) in activity 1.4.1. In activity 1.4.4, BRACE will record the TSRSP's updated secondary curriculum that integrated climate change onto the HAMA eLearning platform.</p> |
| <p><b>Tonga Volcano Recovery Program (TARP II)</b></p> <p>USD 300,000</p> <p>2022-2023</p> <p>Save the Children (GPE)</p>       | <p>The objective of Tonga Volcano Recovery Program (TARP II) is strengthening school-based disaster risk resiliency and preparedness at national, school, and community levels by ensuring students, parents and teachers have improved access to materials for continuity of learning during a disaster through Hama E-learning Platform (HeLP) and for remote islands to have offline access to the contents being uploaded to the HeLP via RACHEL boxes (offline accessible).</p>   | <p>BRACE will align with TARP by building in output 1.3 on the disaster preparedness and materials developed in TARP II and avoid duplication for schools already covered by TARP.</p> <p>For output 1.4, BRACE will build on the development of the HAMA E-learning platform, recording the climate-related updated curricula of TSRSP (see above) as well as the climate change elective.</p>   |
| <p><b>System Transformation Capacity Grant</b></p> <p>USD 1 Million</p> <p>2022-2025</p> <p>Save the Children (GPE)</p>         | <p>The objective of the System Transformation Capacity Grant is to provide assistance to the Ministry of Education and Training focusing on:</p> <p>i. Education Sector Analysis (ESA)</p> <p>ii. Education Sector Plan (Corporate Plan for 2023 – 2026)</p> <p>iii. Joint sector review (JSR).</p>  | <p>The BRACE design team used the ESA to develop the education sector analysis and will align its work with the Education Sector Plan as well as the joint sector review during implementation.</p>   |
| <p><b>Hunga Ha'apai Disaster and COVID19 Recovery and Resilience Activation, Tonga</b></p> <p>AUD 2Million</p> <p>2022-2024</p> | <p>This project is a collaborative effort, involving five Australian Humanitarian Partnership (AHP) consortium partners and a broad cross-section of Tongan civil society and government stakeholders, to address the immediate humanitarian and early recovery needs of those affected by the Hunga Tonga Hunga Ha'apai (HTHH) volcanic eruption and tsunami, while at the</p>  | <p>BRACE will be complementary to Hunga Ha'apai Disaster and COVID19 Recovery and Resilience Activation project, by coordinating with the National School Safety and Resilience Coordination Committee, MET Staff, and using the School Safety and Resilience Handbook for output 1.3 on school preparedness</p>  |

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| CAN DO, Plan International, CARE, CARE, Oxfam, Save the Children (Australian Humanitarian Partnership (AHP), DFAT)  | <p>same time ensuring that the people are well prepared for and more resilient to future disasters. It addresses WASH, protection (psychosocial support), livelihoods, disaster preparedness sectors, with a strong focus on Gender, Equality, Disability and Social Inclusion (GEDSI), localisation and capacity strengthening. The main focus is:</p> <ol style="list-style-type: none"> <li>To establish the National School Safety &amp; Resilience Coordination Committee and support its operations</li> <li>Providing safe schools self-assessment tool, guidance, videos and training module contextualised and approved</li> <li>Provide trainings to MET and partner staff</li> <li>Implementing of the school safety self-assessment to inform School Development Plans of which Safe Schools self-assessment will be implemented in 50 schools.</li> </ol> <p>During the project a School Safety and Resilience Handbook and videos to guide SOPs for disasters and emergencies has been developed and rolled out.</p> | and awareness built on the school development plans.  |
| <b>Tonga Second Resilience Development Policy Operation with a Catastrophe-Deferred Drawdown Option</b> <sup>362</sup><br><br>USD 19 Million<br>2022-2024<br>World Bank | <p>The Second Resilience Development Policy Operation in Tonga supports the Government of Tonga to: (i) strengthen public finance, (ii) enhance resilience to climate change, natural disasters, and health-related risks; and (iii) support economic recovery.</p> <p>The second pillar, relevant for BRACE, supports amongst other things, national disaster risk management legislation and a national disaster risk financing policy. The programme represents a continuation of reform related to climate and disaster resilience and other topics.</p>   | BRACE will align with all climate-related and disaster risk management legislation and policies developed by the Second Resilience Development Policy Operation in Tonga.                 |
| <b>Relevant regional projects</b>   |  |   |
| <b>Pacific Coalition for Advancement of School Safety (PCASS)</b><br><br>14 countries in Pacific  | <p>The Pacific Coalition for the Advancement of School Safety (PCASS) 2020 – 2024 programme brings together partners (Multilateral and bilateral development organisations, private sector, Council of</p>   | <p>Both PCASS and BRACE are built on the Comprehensive School Safety Framework and therefore there is a natural relationship between the two projects. BRACE will coordinate with the</p> |

<sup>362</sup> World Bank. Tonga Second Resilience Development Policy Operation with a Catastrophe-Deferred Drawdown Option. Available [here](#).

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| <p>2020-2025</p> <p>NZD 1 million</p> <p>Save the Children</p> | <p>Regional Organisations of the Pacific (CROP) agencies, INGOs, faith-based and other) in support of Ministries of Education, Child Services and National Disaster Management Offices (NDMO), to collectively improve school safety across the Pacific region. PCASS will support the Pacific's commitments to build a stronger and more resilient region to disasters and climate change in alignment with the Sendai Framework for Disaster Risk Reduction (2015-2030), Pacific Regional Education Framework (PacREF) 2018-2030 and the Framework for Resilient Development in the Pacific (FRDP) (2017-2030).</p> <p>A regional support mechanism enhancing coordination and collaboration and providing technical support will be established and hosted in an existing regional or national governmental body to promote local ownership and the long-term sustainability of the mechanism.</p> <p>The proposed entity will be staffed to support the development and delivery of a demand driven workplan aimed at improving the quality and effectiveness of national School Safety investments in 5 countries (including Tonga) specifically, but available to all countries within the region. The workplan will be consistent with the goals of the Comprehensive School Safety Framework (to protect students and educators from death, injury and harm in schools) and the Save the Children Safe Schools Common Approach, which takes an all-hazards approach and also includes child protection. The objective is to: advance child protection in and around schools; plan for continuity of education through all expected hazards and threats; safeguard education sector investments; strengthen risk reduction and resilience through education; and build on regional and global best practice, using a sustainable and scalable approach for the Pacific region.</p> <p>The PCASS project logic model is structured around 3 outcomes:</p> <ol style="list-style-type: none"> <li>1. A regional Safe Schools coordination mechanism is supporting and</li> </ol> | <p>established regional Safe School coordination mechanism to advance school safety through all PCASS' 3 outcomes, building on lessons learnt, good practices, and tools that have been developed.</p> |
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|   | <p>amplifying national initiatives to advance school safety.</p> <ol style="list-style-type: none"> <li>2. A regional Safe Schools Community of Practise is established and functioning.</li> <li>3. A regional monitoring mechanism for the advancement for Safe Schools in the Pacific is functioning (consistent with the Framework for Resilient Develop in the Pacific (FRDP) and the Sendai Framework for DRR).</li> </ol>  |  |
| <p><b>Climate Smart Education Systems – Strategic Capability Initiative (CSESI)</b></p> <p>30 countries (of which 10 in the Pacific)</p> <p>2023-2025</p> <p>USD 15 million</p> <p>GPE, UNESCO/UNESCO-IIEP, Save the Children</p> | <p>CSESI seeks enhance countries’ capacities to mainstream climate change adaptation and environmental sustainability into education sector plans, budgets and strategies as well as to enhance education ministry capacity for cross-sectoral coordination on climate and environment-related policy and programming.</p> <p>The initiative has 7 aims:</p> <ol style="list-style-type: none"> <li>1. Education ministries have enhanced capacities to develop evidence-based policies and plans for climate change adaptation and environmental sustainability</li> <li>2. Education sector coordinates effectively internally and with other sectors around climate change policy and programming (including disaster risk management mechanisms)</li> <li>3. Education ministries are able to access increased climate financing for education sector activities</li> <li>4. Education sector has timely access and capacity to use climate-related data and integrates it into its planning and monitoring systems</li> <li>5. Education infrastructure is safer, greener and more resilient to the impacts of climate change</li> <li>6. Education ministries are better equipped to improve the resilience of schools to climate risks, including enhanced capacity to strengthen school safety and educational continuity management</li> <li>7. Education system integrates climate change and environmental sustainability into curricula, pedagogy and teacher training</li> </ol> | <p>BRACE will coordinate with CSESI and align with the policies and plans developed by MET through CSESI, and support any coordination and efforts to increase access to climate financing (see also BRACE component 2 and 3).</p> <p>Furthermore, BRACE will support CSESI aims 4, 5 and 7 through output 1.2 on climate resilient school infrastructure and WASH facilities, output 1.3 increase access and use of CIS and EWS and output 1.4 on embedding of climate, risk reduction and resilience in curricula.</p> |

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|  | Each country chooses one or more aims that they would like to receive support with.  |  |
| <b>Relevant recently completed projects</b>  |  |  |
| <b>Pacific Resilience Program (PREP)</b> (Tonga, Marshall Islands, Vanuatu) <sup>363</sup><br>2015-2023<br>USD 39 million<br>World Bank  | PREP's objective for Tonga was to strengthen early warning, resilient investments and financial protection of Tonga. The Program's components are strengthening early warning and preparedness, risk reduction and resilient investments, disaster risk financing and project and program management. PREP has been a building block for TSRSP (see above) and has been engaged in disaster response training of government staff and supported the construction and opening of two new Emergency Operations Centers in Ha'apai and Vava'u.  | PREP has been a building block of the TSRSP (see above). For output 1.3 focused on disaster preparedness and awareness, BRACE will build on PREP's focus on strengthening the early warning systems as well as multi-hazard risk information systems, hazard model for forecasting of impacts of extreme events operationalised, and development of decision tools of Tonga. |
| <b>Pacific Safer Schools Program (PSSP): Pacific Safer Schools Pacific Roadmap Technical Assistant</b> (Tonga, Samoa, Vanuatu) <sup>364</sup><br>2015-<br>USD 0.7 million<br>World Bank, GFDRR | Safer Schools Pacific Roadmap Technical Assistance's aim was a multiyear program of research and capacity-building activities carried out across the Pacific Island countries of Samoa, Tonga, and Vanuatu to increase the resilience of schools and the education sector to a range of hazards and disaster events. PSSP supported and complemented school retrofitting and reconstruction activities by the countries' governments under the Pacific Resilience Program.<br><br>Part of the Pacific Safer Schools Program, the Safer Schools Pacific Roadmap Technical Assistance aims to boost and facilitate informed, large-scale investments for safety and resilience of new and existing school infrastructure at risk from natural hazards, contributing to high-quality learning environments. Diagnostic fieldtrips took place to understand available school infrastructure baseline data as well as the local construction and financing environments. These visits help to identify potential opportunities where GPSS technical assistance could support clients in | PSSP was the foundation for PREP and TSRSP and aligns strongly with BRACE 1.2 focused on strengthening the climate resilience of school infrastructure and WASH facilities.  |

<sup>363</sup> World Bank. Pacific Resilience Program (PREP). Available [here](#). And World Bank (2022) US\$19 Million for Safer Schools and Improved Emergency Early Warning Systems in Tonga. Available [here](#). World Bank (2024) *Implementation Completion and Results Report*. Available [here](#)

<sup>364</sup> World Bank. Pacific Safer Schools Program (PSSP): Pacific Safer Schools Pacific Roadmap Technical Assistant. Available [here](#). And World Bank. Global Program for Safer Schools. Available [here](#).

|   |   |  |
|---|---|--|
|   | the design of risk reduction strategies and investments in safer education facilities.  |  |
| <b>Pacific Safer Schools Program (PSSP): Safe Schools Rapid Diagnostics in Tonga</b> <sup>365</sup><br>2017-2019<br>USD 60,000<br>World Bank, GFDRR | <b>Safer Schools Rapid Diagnostics in Tonga</b> assessed the vulnerability of existing school infrastructure to natural hazards and determined contributing factors of risk to school infrastructure. The goal was to help the government of Tonga develop a school reconstruction and retrofitting programme through PREP.   | BRACE builds on the assessment done by PSSP to select the sites for output 1.2 focusing on increased climate resilience of the educational infrastructure.   |
| <b>Accelerating Climate Education program</b> <sup>366</sup><br>2016-2021<br>AUD 7.5 Million<br>DFAT  | This regional/global program helped the Tonga Skills Program tailor climate education materials, enabling integration of climate change skills development into vocational training courses.  | During implementation BRACE will build on the climate education materials developed for vocational training courses, to develop the climate change elective course (output 1.4) and ensure alignment.                            |
| <b>Tonga First Resilience Development Policy operation</b> <sup>367</sup><br>2020-2021<br>USD 5.5 Million<br>World Bank                             | Similar objectives to Tonga Second Resilience Development Policy Operation with a Catastrophe-Deferred Drawdown Option (see above), with a focus on post-Tropical Cyclone Gita and Covid-19 response.   | See Tonga Second Resilience Development Policy Operation with a Catastrophe-Deferred Drawdown Option (above).  |
| <b>Tonga Accelerated Resilience Program (TARP) I</b><br>2020-2021<br>USD 749,982<br>Save the Children (GPE)   | TARP worked with the MET to minimise learning loss and disruption for students impacted by disasters, including climate change induced disasters, natural disasters and COVID-19. TRAP has two priority outcomes:<br>i) The physical and emotional health of learners and teachers across all education levels is supported<br>ii) The education system is more resilient and all students have access to continuing educational opportunities. | BRACE will build on TARP's developed materials, tools, best practices and lessons learnt, while implementing output 1.3 focused on school safety and educational continuity management and disaster preparedness and awareness.  |
| <b>Coping with Climate Change in the Pacific Islands Region (CCCPIR)</b> <sup>368</sup>   | The CCCPIR aimed to strengthen the capacities of regional organisations in the Pacific Islands region and its Member States to adapt to climate change and mitigate its causes. In Tonga it focused on food security, agroforestry, and land use planning. It also  | BRACE will gain inspiration and build on the guide for Pacific teachers, the children's book, and other materials and tools developed during the CCCPIR project, when developing the climate change elective (see output 1.4) to |

<sup>365</sup> World Bank. Safer Schools Rapid Diagnostics in Tonga. Available [here](#).

<sup>366</sup> Government of Australia. *Tonga: Australia's commitment to strengthening climate and disaster resilience in the Pacific*. Available [here](#). And UNESCO. *Climate Change Communication and Education*. Available [here](#).

<sup>367</sup> World Bank. Development Projects: Tonga First Resilience Development Policy Operation. Available [here](#).

<sup>368</sup> SPC (unknown) *Coping with Climate Change in the Pacific Islands Region (CCCPIR)*. Available [here](#).

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|-----------------------------|---|--|
| 2009-2015<br>?<br>SPC (GIZ) | <p>produced a <i>Learning about climate change the Pacific Way – a guide for Pacific Teachers: Tonga</i>.<sup>369</sup></p> <p>Key achievements of CCCPIR was:</p> <ul style="list-style-type: none"> <li>• Climate Change Warriors project: Secondary Students Analyse Impacts and Take Action, was rolled out, supported by the SPC /Australian Multi-Country Climate Change Adaptation Program.</li> <li>• The children's story book Pou and Miri on learning to tackle climate change was translated into Tongan.</li> <li>• Lecturers at the Tonga Institute of Education and curriculum officers from the Ministry of Education identified key messages and will work on strengthening their respective curricula (this with support from the Institute of Education/USP under SPC Australian funding).</li> <li>• A sub-working group on education on climate change and DRM under MECC (now MEIDECC) was endorsed in 2012.</li> </ul> | ensure alignment and avoid duplication of efforts. |
|-----------------------------|---|--|

## 4.2 Climate Context

Tonga is a Polynesian archipelago located in the South Pacific Ocean. Comprising 169 islands, of which only 36 are inhabited, Tonga spans an area of about 750 km<sup>2</sup>. The country is divided into four main island groups: Tongatapu, Ha'apai, Vava'u, and the Niua. Nuku'alofa, situated on the largest island of Tongatapu, serves as the nation's capital and political, economic, and cultural centre.

Tonga is home to approximately 105,000 people (2023), the majority of whom are ethnic Tongans of Polynesian descent. The official languages are Tongan and English, with Tongan culture deeply rooted in traditional Polynesian values and Christianity.<sup>370</sup>

Tonga's economy is small and primarily reliant on agriculture, fisheries, remittances, and international aid. Agriculture remains a vital sector, with root crops like taro, yams, and cassava being staples, along with the cultivation of fruits like bananas and coconuts. Fisheries, particularly tuna and reef fish, are essential for both domestic consumption and export.<sup>371 372</sup>

Remittances from Tongans living abroad, particularly in New Zealand, Australia, and the United States, contribute significantly to the national economy, accounting for around 30% of GDP. Tourism, though modest compared to other Pacific nations, is growing steadily due to Tonga's pristine beaches, whale-watching opportunities, and rich cultural heritage.

<sup>369</sup> Coping with Climate Change in the Pacific Island Region (2013) *Learning about climate change the Pacific Way – a guide for Pacific Teachers: Tonga*. Available [here](#).

<sup>370</sup> Tonga Statistics Department (2023)

<sup>371</sup> World Bank: Tonga Economic Overview (2023)

<sup>372</sup> FAO: Tonga Agriculture and Fisheries Report (2023)



Tonga's natural environment is characterized by volcanic islands, coral atolls, and lagoons, supporting diverse marine ecosystems and terrestrial biodiversity. The nation's Exclusive Economic Zone (EEZ) extends over 700,000 km<sup>2</sup>, providing significant marine resources. However, Tonga faces challenges in managing these resources sustainably due to overfishing and habitat degradation.

Climate change poses a major threat to Tonga, as the country is highly vulnerable to rising sea levels, tropical cyclones, and coastal erosion. Frequent cyclones, such as Cyclone Gita in 2018, have caused extensive damage to infrastructure, homes, and agriculture, underscoring the need for climate adaptation strategies. Tonga has committed to enhancing its resilience through renewable energy initiatives and coastal protection projects.<sup>373</sup>

Tonga has achieved significant progress in education and health outcomes, with literacy rates exceeding 99% and primary education being free and compulsory. However, the country faces challenges related to non-communicable diseases (NCDs) such as diabetes and cardiovascular illnesses, which are prevalent due to changing diets and lifestyles.<sup>374</sup>

Infrastructure development is ongoing, particularly in the energy and transport sectors, to improve connectivity within the islands and reduce reliance on imported fossil fuels. Investments in solar and wind energy are part of Tonga's long-term vision for sustainable development.

#### National climate

Tonga's climate is characterized as a tropical maritime climate, shaped by its location in the South Pacific Ocean between latitudes 15°S and 23°S. The country experiences warm temperatures, high humidity, and significant rainfall, with climate patterns heavily influenced by oceanic and atmospheric systems, including the South Pacific Convergence Zone (SPCZ), trade winds, tropical cyclones, and global climate phenomena such as the El Niño-Southern Oscillation (ENSO).

The SPCZ is one of the most significant climatic features influencing Tonga's weather. It is a region where warm, moist air converges, creating heavy rainfall and thunderstorms. The position of the SPCZ shifts seasonally, bringing wetter conditions to Tonga during the austral summer (November to April) and drier conditions during the cooler months (May to October). The intensity and variability of rainfall in Tonga are closely linked to the movements of the SPCZ.

The southeast trade winds dominate Tonga's climate, particularly during the dry season from May to October. These winds bring cooler and drier conditions, moderating temperatures and reducing humidity levels. During the wet season, the weakening of the trade winds coincides with increased rainfall and warmer temperatures.

Tonga lies within the South Pacific cyclone belt, making it highly vulnerable to tropical cyclones, particularly during the cyclone season (November to April). Cyclones can bring destructive winds, heavy rainfall, storm surges, and flooding. Recent cyclones, such as Cyclone Harold (2020) and Cyclone Gita (2018), have caused extensive damage to infrastructure, agriculture, and homes, highlighting Tonga's vulnerability to extreme weather events.

Rainfall in Tonga varies across its islands, with the northern islands (e.g., Niuatoputapu) receiving more rain than the southern islands (e.g., Tongatapu). Annual rainfall ranges from 1,700 mm in Tongatapu to over 2,500 mm in the northern islands. The wet season accounts for the majority of rainfall, with intense, short-lived downpours often linked to tropical systems.

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<sup>373</sup> UNDP: Climate Change and Disaster Risk Reduction in Tonga (2023)

<sup>374</sup> Tonga Statistics Department (2023)

Temperatures in Tonga are warm year-round, averaging between 24°C and 29°C. The hottest months are typically January and February, while the coolest months are July and August. Humidity is consistently high, particularly during the wet season, contributing to the tropical feel of the climate.

ENSO events play a major role in Tonga's inter-annual climate variability:

- During El Niño years, Tonga typically experiences below-average rainfall, prolonged dry spells, and an increased risk of drought. El Niño conditions can also reduce the frequency of tropical cyclones.
- Conversely, La Niña years bring above-average rainfall and an increased likelihood of flooding. Tropical cyclone activity is often more intense during La Niña events.

Tonga is highly vulnerable to the impacts of climate change, particularly rising sea levels and increasing temperatures. The country has experienced a sea level rise of approximately 6 mm per year since 1993, higher than the global average. This poses significant risks to Tonga's low-lying islands, exacerbating coastal erosion, saltwater intrusion into freshwater supplies, and the loss of arable land.

Climate change is also intensifying the frequency and severity of extreme weather events, including cyclones and heat waves. These changes threaten Tonga's food security, as agriculture and fisheries are highly sensitive to climate variability. Additionally, coral bleaching due to rising sea temperatures and ocean acidification poses a threat to Tonga's marine ecosystems and the livelihoods of its coastal communities.

### *Historical climate trends*

Tonga's climate from 1980 to 2020 has been characterized by significant rainfall trends and variability, shaped by its location in the South Pacific. The annual precipitation averaged approximately 1,909 mm during this period, showing a statistically significant increase of 3.6% per decade. Current rainfall levels range between 1,918.29 mm and 2,079.06 mm, with higher rainfall volumes generally recorded in the northern islands. Rainfall is most pronounced during the peak season from December to March, with monthly totals exceeding 350 mm. The months from May to October experience slightly lower rainfall, averaging around 200 mm per month.

Annual wet days averaged 111.5 days, with a slight, though not statistically significant, increasing trend of 1.96 days per decade. Wet days now range between 111.83 and 116.76 days annually. The northern islands experience the highest frequency of heavy rainfall events, with monthly peaks reaching 250 mm and approximately 20 days of rainfall exceeding 20 mm.

Tonga's vulnerability to tropical cyclones adds to its rainfall variability, with an annual probability of occurrence of around 4%, particularly impacting the northern areas. These cyclones can bring intense, short-term rainfall and flooding, which pose significant challenges to infrastructure and agriculture.

The Standardized Precipitation-Evapotranspiration Index (SPEI) averaged -0.05 during this period, indicating moderate drought conditions. While there has been a not statistically significant decreasing trend of -0.09 per decade, the index now ranges between -0.25 and 0.28, reflecting increased variability and occasional severe drought events. However, spatial disparities in drought occurrence are minimal across the islands.

Dry spell durations are moderate, typically lasting 10 to 15 days, with consecutive wet periods ranging from 20 to 30 days. The northern areas experience slightly longer wet spells, correlating with their higher rainfall volumes. The aridity index remains mild, suggesting generally sufficient water

availability, though variability in dry and wet periods may affect agricultural and water resource planning.

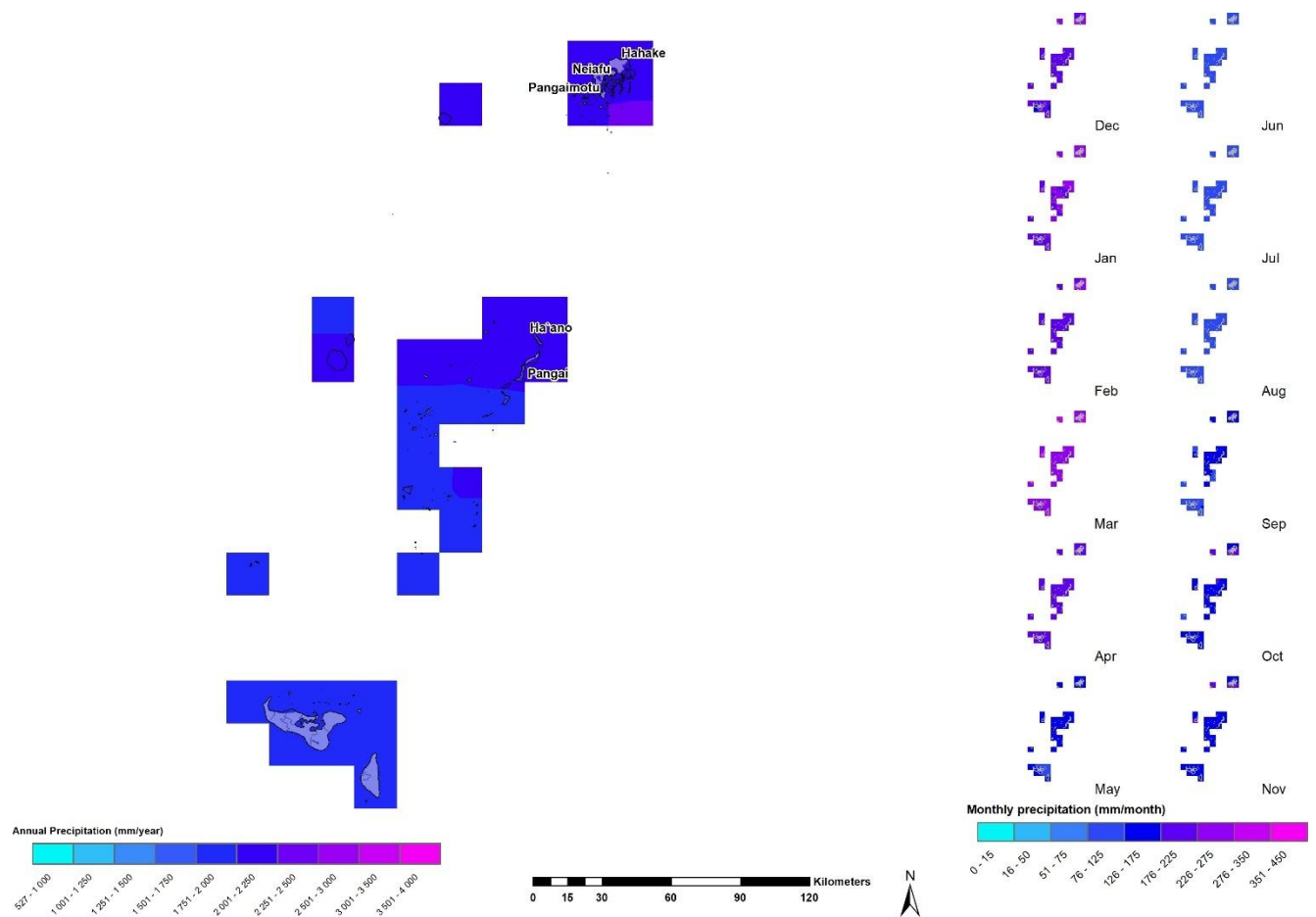
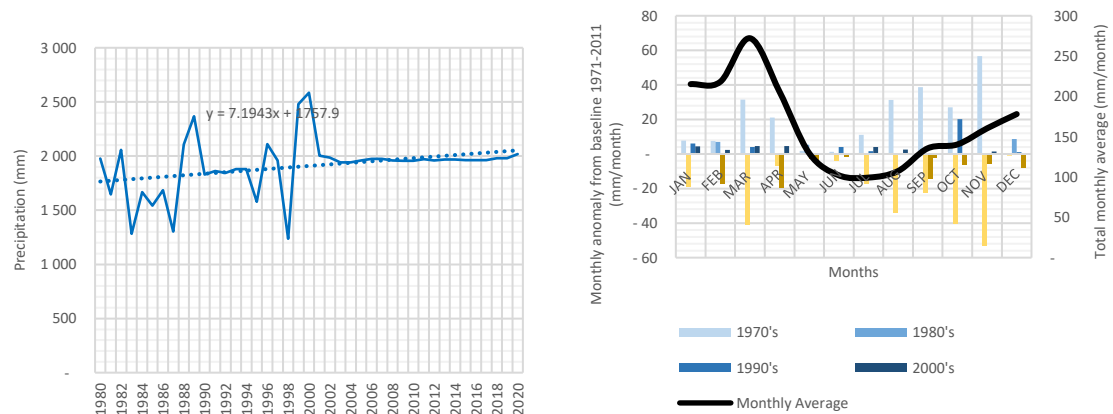


Figure 4-1: Current rainfall volume distribution. Annual (left) and monthly (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)





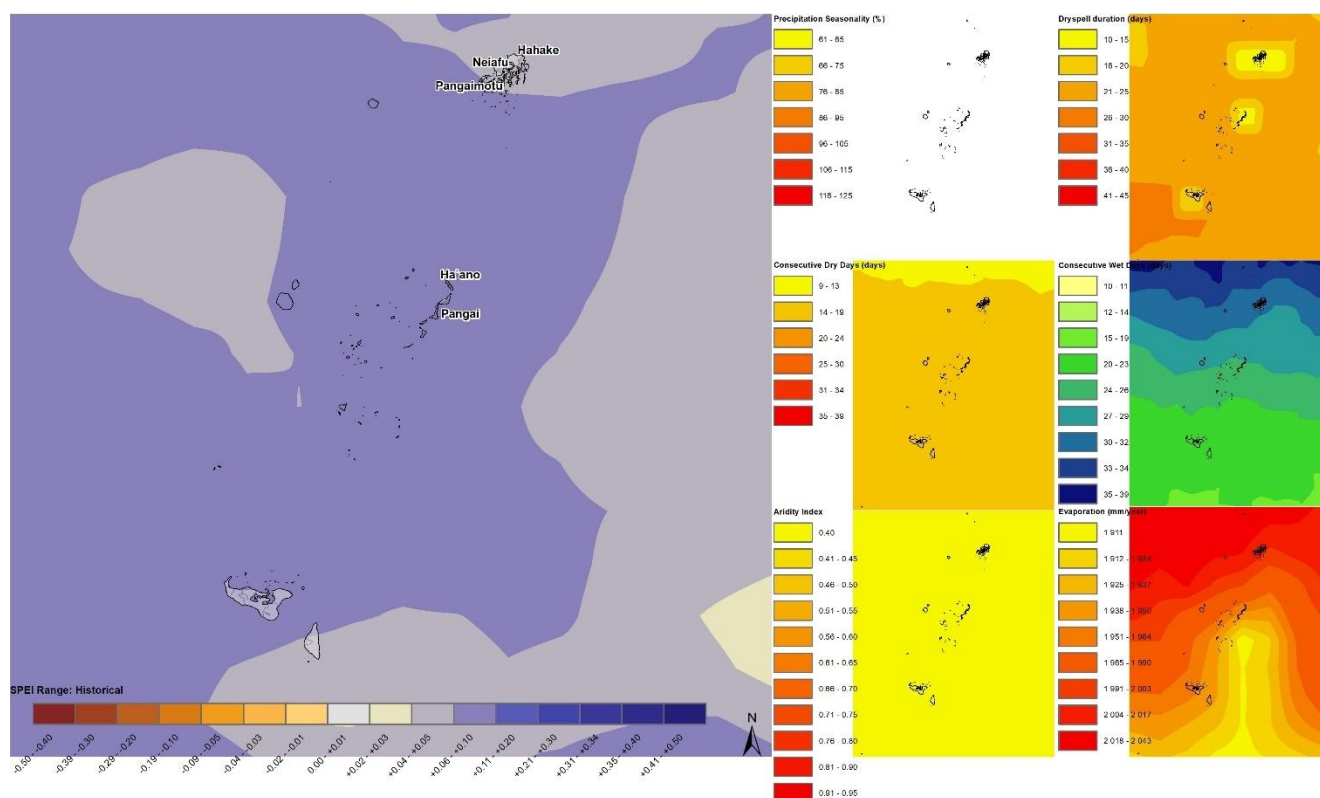


Figure 4-4: Current Drought and drying rainfall characteristics. Flood areas (left), extreme rainfall characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

Tonga's climate from 1980 to 2020 has experienced a clear warming trend across all temperature metrics. The observed minimum temperature during this period averaged approximately 22.96°C, with a statistically significant increase of 0.16°C per decade. This trend reflects a gradual rise in nighttime temperatures, which has implications for energy demand, ecosystems, and human comfort during rest periods.

The mean temperature also showed a statistically significant increase, averaging 25.64°C and rising by 0.16°C per decade. This steady warming indicates changes in the baseline conditions for daily temperature cycles, which can affect agricultural productivity, water demand, and public health.

Similarly, maximum temperatures averaged 28.37°C, with a statistically significant increase of 0.16°C per decade. The rise in daytime temperatures is particularly critical for outdoor workers and vulnerable populations, as it amplifies the risk of heat-related stress and dehydration.

These warming trends are consistent with global climate change patterns and highlight the need for Tonga to consider adaptive measures. Rising temperatures may impact sectors such as agriculture, where heat stress could affect crop yields and livestock productivity, and energy, where cooling demand may increase. The incremental warming of minimum, mean, and maximum temperatures underscores the importance of integrating climate resilience into national planning and development strategies to mitigate potential impacts on livelihoods and ecosystems.

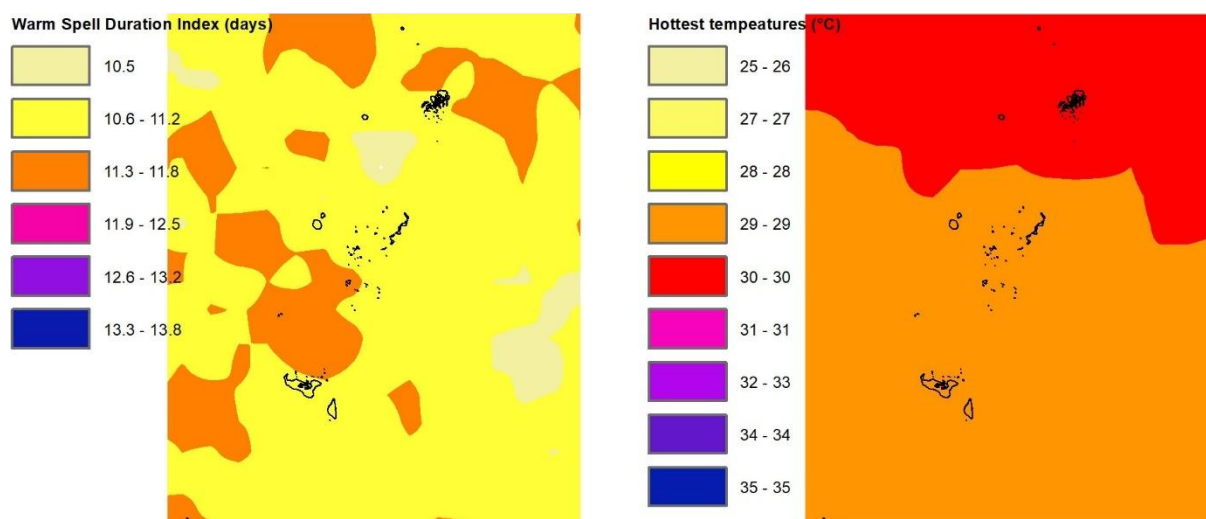


Figure 4-5: Current heatwave and extreme temperature characteristics. (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)

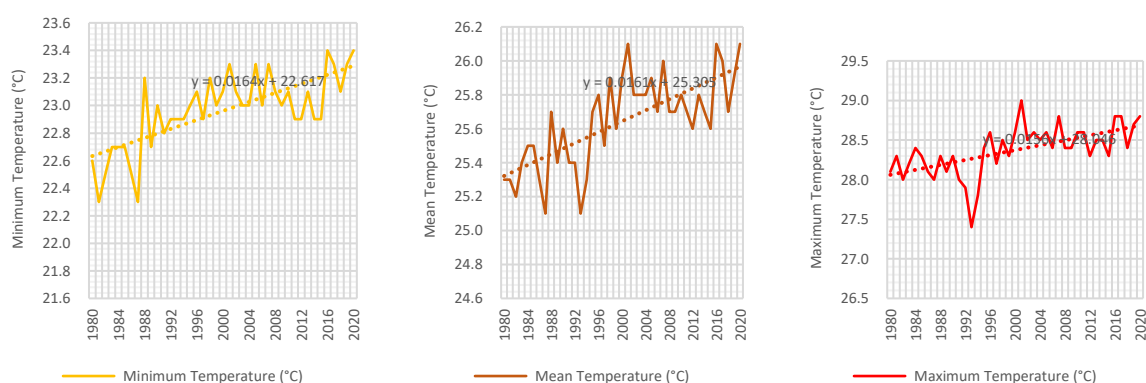


Figure 4-6. Longitudinal change in temperatures from 1980-2020. Minimum (left), Mean (centre), Maximum (right) temperatures

Table 4-2. Change in temperatures from 1980-2020

|                           | Minimum Temperature (°C)  | Mean Temperature (°C)     | Maximum Temperature (°C)  |
|---------------------------|---------------------------|---------------------------|---------------------------|
| Mean 1980-2020            | 22.96                     | 25.64                     | 28.37                     |
| 95% confidence interval   | 23.04 - 23.2°C            | 25.75 - 25.91°C           | 28.48 - 28.67°C           |
| Trend                     | Statistically Significant | Statistically Significant | Statistically Significant |
| Trend (change per decade) | 0.16°C                    | 0.16°C                    | 0.16°C                    |

### Projected climate trends

Under the SSP2-4.5 climate scenario, Tonga's rainfall projections from 2020 to 2050 indicate nuanced changes in precipitation patterns, extreme rainfall events, and drought dynamics. The annual precipitation is expected to average approximately 1,732.93 mm, with a slight, though not statistically significant, decrease trend of -0.64% per decade. Rainfall totals are projected to range between 1,687.61 mm and 1,735.32 mm annually. This overall decrease masks significant spatial and temporal variability, with the northern islands likely experiencing more pronounced changes.

The intensity of extreme rainfall events is expected to increase moderately, though trends are not statistically significant. The peak one-day maximum rainfall is projected to average 75.55 mm, with an increase of 0.98 mm per decade, ranging between 74.65 mm and 76.94 mm. Similarly, the five-day



maximum rainfall is projected to average 171.12 mm, with a slight increase of 1.36 mm per decade, ranging between 169.13 mm and 174.19 mm. Peak one-month maximum rainfall is expected to average 336.87 mm, with a small increase of 2.01 mm per decade. These increases are more pronounced in the northern islands, where extreme rainfall events are expected to be more intense.

The annual number of days with rainfall exceeding 20 mm is projected to average 19.81 days, with a slight decrease of -0.23 days per decade, ranging between 18.81 and 19.66 days. Conversely, the number of days with rainfall above 50 mm is projected to average 2.84 days, with a marginal increase of 0.03 days per decade, though this trend shows significant spatial variability.

Drought conditions are projected to improve slightly, with an average value of 0.07 and a small, non-statistically significant increase trend of 0.02 per decade. This indicates fewer and less severe drought events, particularly in the northern areas, although drought remains a concern across the country. There is also a slight increase in aridity and average evaporation, which could exacerbate water availability challenges in some regions. Consecutive dry days are expected to average 13.64 days annually, with no significant trend, while consecutive wet days are projected to average 25.7 days, with a slight, spatially varied increase.

The projected future shows a small decrease in the occurrence of category 3 tropical cyclones and a general reduction in the total number of cyclones affecting Tonga. However, tropical cyclones remain a significant climate impact for the country, given their potential for widespread destruction and disruption.

Rainfall seasonality is projected to increase, resulting in greater year-on-year disparities. This heightened variability underscores the need for flexible and adaptive water resource management strategies to address potential shifts in agricultural productivity and water availability.

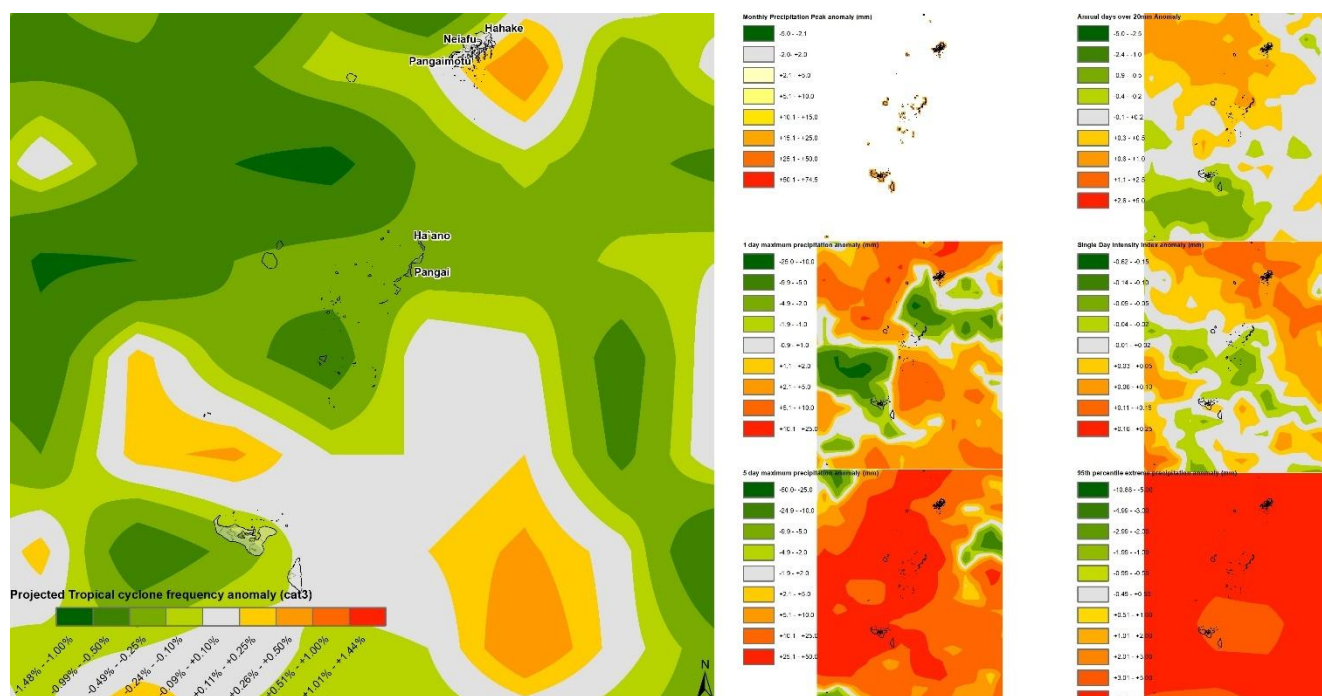


Figure 4-7: Projected flooding and extreme rainfall characteristics. Flood areas (left), extreme rainfall anomaly characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)



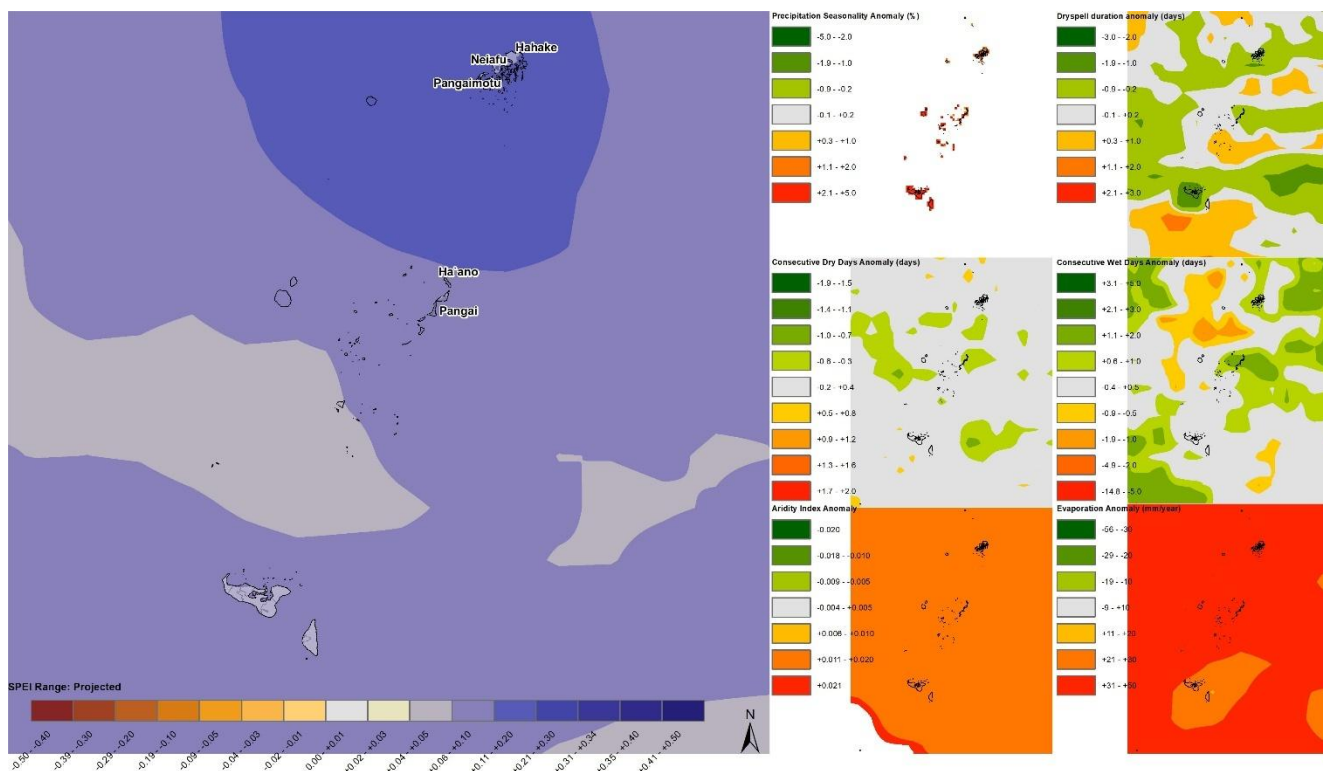
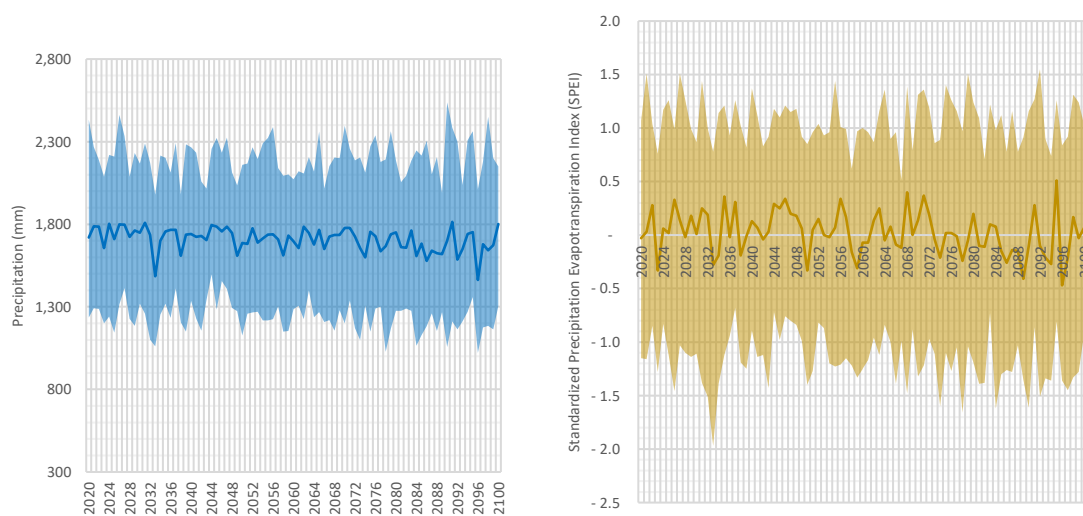


Figure 4-8: Projected Drought and drying rainfall characteristics. Flood areas (left), extreme rainfall characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)



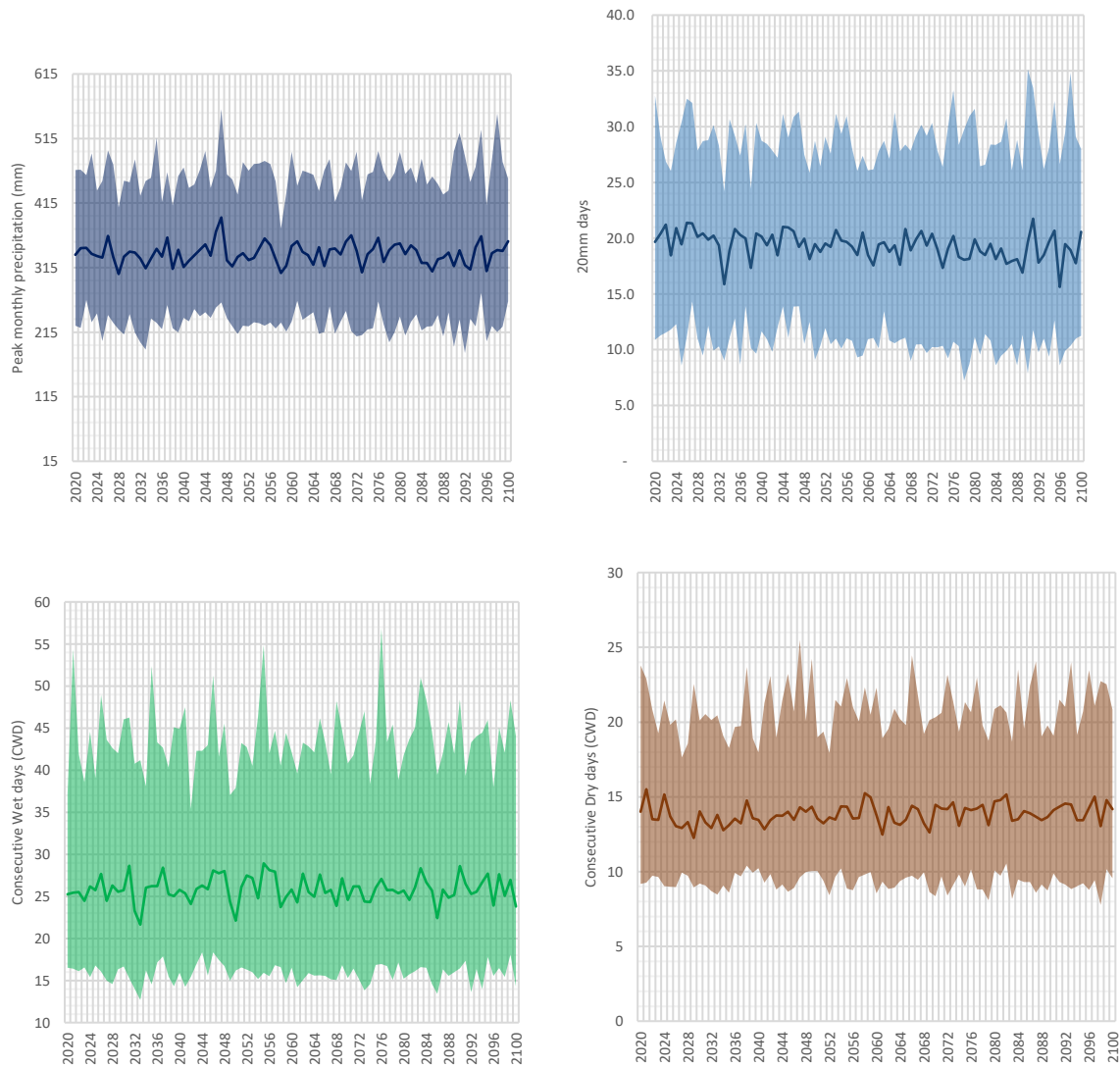
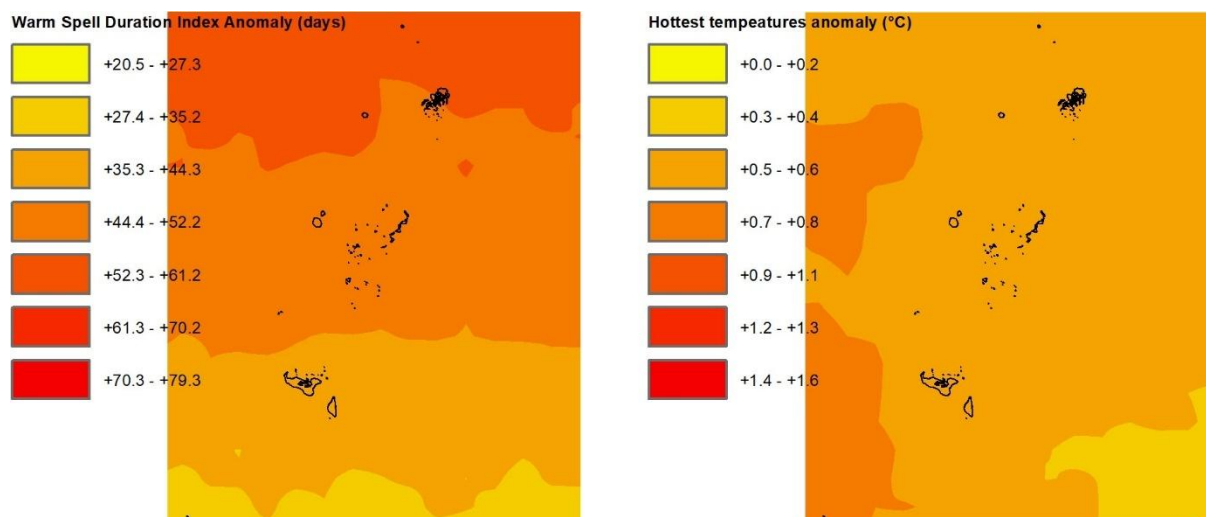


Figure 4-9. Longitudinal change in rainfall parameters from 2020-2100 (SSP2-45). Annual rainfall (top left), SPEI index (top right), Peak 1-day rainfall (middle left), 20mm days (middle right), consecutive wet days (bottom left), and consecutive dry days (bottom right)

Table 4-3. Projected change in rainfall from 1980-2020

|                           | Minimum Temperature       | Mean Temperature          | Maximum Temperature       | Lowest Minimum Temperature | Highest maximum Temperature | Days above 25°C           |
|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------|-----------------------------|---------------------------|
| Mean 2020-2050            | 24.7                      | 25.3                      | 25.9                      | 20.8                       | 28.8                        | 248.5                     |
| 95% confidence interval   | 25.17 - 25.29°C           | 25.75 - 25.87°C           | 26.33 - 26.45°C           | 21.21 - 21.38°C            | 29.28 - 29.41°C             | 270.55 - 277.77 days      |
| Trend                     | Statistically Significant | Statistically Significant | Statistically Significant | Statistically Significant  | Statistically Significant   | Statistically Significant |
| Trend (change per decade) | 0.17°C                    | 0.17°C                    | 0.17°C                    | 0.2°C                      | 0.19°C                      | 9.6 days                  |



*Figure 4-10: Projected heatwave and extreme temperature characteristics. Peak monthly temperatures (left), extreme temperature characteristics (right) (Map source: United Nations OCHA HDX Platform, 18 Dec 2024)*

Under the SSP2-4.5 climate scenario, Tonga is projected to experience significant warming trends from 2020 to 2050, with increases across all temperature metrics. Minimum temperatures are expected to average approximately 24.71°C, with a statistically significant increase of 0.17°C per decade. Similarly, mean temperatures are projected to average 25.3°C, and maximum temperatures 25.89°C, both rising at the same rate of 0.17°C per decade. These trends indicate a consistent warming trajectory that will have implications for ecosystems, infrastructure, and public health.

The lowest minimum temperatures, averaging 20.79°C, are projected to increase significantly by 0.2°C per decade, reaching between 21.21°C and 21.38°C by mid-century. This upward shift suggests warmer nights, which may reduce the relief typically provided by cooler evenings. Conversely, the highest maximum temperatures are projected to average 28.82°C, with a significant increase of 0.19°C per decade, reaching between 29.28°C and 29.41°C. These elevated daytime temperatures are expected to be most pronounced in the western regions of Tonga.

The number of days exceeding 25°C is projected to increase substantially, with an average of 248.53 days annually, rising at a statistically significant rate of 9.6 days per decade. By 2050, these warm days are expected to occur between 270.55 and 277.77 days annually, effectively making high temperatures a near-constant feature of Tonga's climate.

Warm spell durations are projected to increase significantly, particularly in the northern islands, where +50 days annually are expected to contribute to extended periods of elevated temperatures. While the temperature increase across the islands is projected to average around +0.5°C, the impacts of these changes will be spatially varied, with western regions experiencing the highest peak temperature anomalies.

These warming trends highlight the need for proactive measures to adapt to the changing climate. Longer and more intense warm spells can increase the risk of heat-related illnesses, particularly for vulnerable populations such as children, the elderly, and outdoor workers. Warmer nights and consistently high daytime temperatures can also strain energy resources due to increased demand for cooling. Moreover, higher temperatures can impact agriculture, particularly heat-sensitive crops, and exacerbate water stress through increased evapotranspiration.

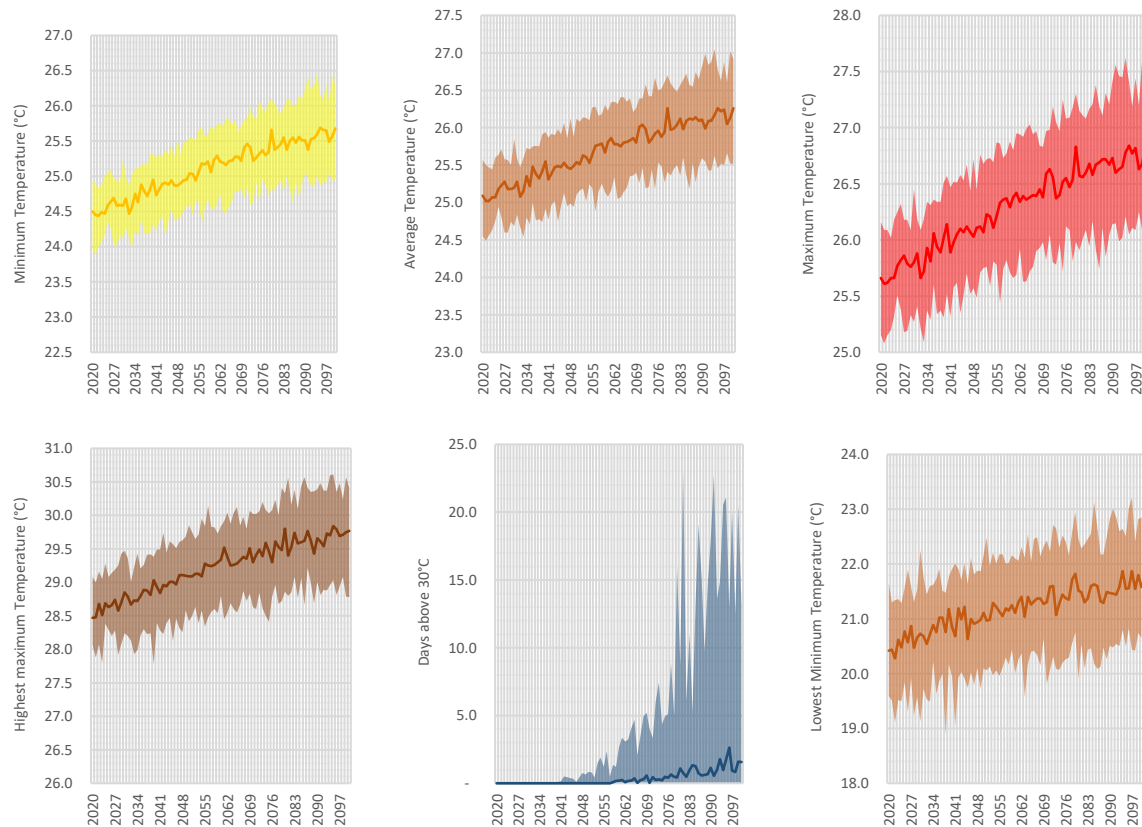


Figure 4-11. Longitudinal change in temperatures from 2020-2100 (SSP2-45). Minimum (top left), Mean (top centre), Maximum (top right) temperatures, Peak maximum temperature (bottom right), days above 30 °C (bottom middle), and lowest nighttime temperatures (bottom right)

Table 4-4. Projected change in temperatures from 2020-2050

|                           | Minimum Temperature       | Mean Temperature          | Maximum Temperature       | Lowest Minimum Temperature | Highest maximum Temperature | Days above 25°C           |
|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------|-----------------------------|---------------------------|
| Mean 2020-2050            | 24.7                      | 25.3                      | 25.9                      | 20.8                       | 28.8                        | 248.5                     |
| 95% confidence interval   | 25.17 - 25.29°C           | 25.75 - 25.87°C           | 26.33 - 26.45°C           | 21.21 - 21.38°C            | 29.28 - 29.41°C             | 270.55 - 277.77 days      |
| Trend                     | Statistically Significant | Statistically Significant | Statistically Significant | Statistically Significant  | Statistically Significant   | Statistically Significant |
| Trend (change per decade) | 0.17°C                    | 0.17°C                    | 0.17°C                    | 0.2°C                      | 0.19°C                      | 9.6 days                  |

### Focus area climate changes

The following presents the detailed climate changes in each of the focus areas.

The climate projections for Ha‘apai and Vava‘u highlight both shared trends and region-specific differences, each with important implications for school-age children and educational infrastructure. Statistically significant warming is evident across all temperature metrics in both regions. However, Ha‘apai exhibits slightly slower warming compared to Vava‘u. For example, the duration of warm spells increases by 26.55 days per decade in Ha‘apai, while Vava‘u experiences a sharper rise of 29.07 days

per decade. Peak daily temperatures are projected to rise similarly in both regions at a rate of 0.16°C per decade, with Vava'u's projected peak temperature of 29.1°C slightly exceeding Ha'apai's.

Both regions are expected to experience slight declines in annual rainfall, with Ha'apai showing a more pronounced reduction (-0.46% per decade) compared to Vava'u (-0.4% per decade). However, these rainfall trends are not statistically significant. Similarly, extreme rainfall events (days exceeding 50 mm) are projected to increase slightly in both regions, though these trends remain minor and lack statistical significance.

A critical divergence arises in drought resilience. Ha'apai faces a statistically significant decline in drought resilience, with the Standardized Precipitation Evapotranspiration Index (SPEI) decreasing by -0.02 per decade, indicating higher drought severity. While Vava'u also shows a statistically significant negative SPEI trend, the impact is less severe compared to Ha'apai. Additionally, relative humidity is projected to increase consistently in both regions, with slightly higher levels in Vava'u (79.55%) compared to Ha'apai (78.64%).

### **Impact on School-Age Children**

- **Heat Stress and Fatigue:** Longer warm spells in Vava'u (up to 83.93 days by 2050) compared to Ha'apai (73.8 days) increase the risk of heat stress, dehydration, and reduced physical activity tolerance for children in both regions.
- **Sleep Disruption:** Tropical nights (>20°C) are a constant feature in both regions, potentially disrupting sleep, focus, and academic performance.
- **Increased Illness:** Warmer, more humid conditions in both areas can foster respiratory and skin infections, while drought conditions in Ha'apai may limit access to clean water, increasing the risk of waterborne diseases.
- **Ha'apai's statistically significant drought trends** may reduce water availability for school gardens and hygiene facilities, impacting children's nutrition and cleanliness.
- **Stable rainfall in extreme events** suggests less vulnerability to flooding, though schools in low-lying areas may still face risks from coastal inundation.
- **Rising temperatures and prolonged warm spells** in both regions necessitate improved cooling systems, adequate ventilation, and shaded outdoor spaces for schools.
- **In Vava'u, longer warm spells** may demand higher energy use for air conditioning or alternative cooling methods, increasing operational costs.
- **Schools in Ha'apai** may face compounded challenges from drought-driven water shortages, potentially affecting sanitation and classroom cooling systems.
- **Both regions** will require investments in climate-resilient infrastructure, such as heat-resistant roofing and rainwater harvesting systems.

### *Ha'apai*

Future climate projections for Ha'apai indicate significant changes in rainfall patterns and extreme rainfall events. Annual rainfall is expected to decline at a statistically significant rate of -0.46% per decade, equating to a decrease of 7.58 mm per decade. The average annual rainfall for the period 2015-2035 is 1658 mm, with a 95% confidence range of 1621.42 to 1695.16 mm. By 2020-2050, this is projected to further decrease to 1655 mm/year.

Extreme rainfall events also exhibit notable trends. The number of days with more than 20 mm of rain is projected to decline at a statistically significant rate of -0.21 days per decade, with an average of 18.93 days per year and a 95% confidence range of 18.29 to 19.57 days. Conversely, the number of days exceeding 50 mm of rain shows a slight, not statistically significant increase of 0.02 days per decade, with an average of 2.56 days annually and a confidence range of 2.38 to 2.74 days.

For intense precipitation events, single-day peak rainfall magnitudes are projected to increase slightly by 0.43 mm per decade, averaging 72.37 mm, though this trend is not statistically significant. The 95% confidence range for single-day peak rainfall is 69.76 to 74.99 mm. Similarly, five-day peak rainfall magnitudes are projected to increase by 0.55 mm per decade, averaging 160.92 mm, with a confidence range of 156.53 to 165.31 mm, but this trend is also not statistically significant. Peak monthly rainfall is expected to rise minimally by 0.11 mm per decade, with an average of 323.61 mm and a confidence range of 315.85 to 331.37 mm, again showing no statistical significance.

Future climate projections for Ha‘apai highlight significant changes in drought, dry spells, and moisture levels. The Standardised Precipitation Evapotranspiration Index (SPEI), a key indicator of drought severity, shows a statistically significant decline of -0.02 SPEI per decade. With an average value of 0.08 and a 95% confidence range of 0 to 0.17, this trend indicates that Ha‘apai is likely to experience more severe and frequent droughts in the future.

Consecutive dry days are projected to increase at a statistically significant rate of 0.1 days per decade, with an average of 14.18 days annually and a 95% confidence range of 13.75 to 14.6 days. This suggests longer periods without rainfall, which could exacerbate water shortages. Conversely, consecutive wet days are expected to decrease slightly by -0.05 days per decade, averaging 24.45 days per year with a confidence range of 23.46 to 25.44 days. However, this trend is not statistically significant, indicating less certainty in prolonged wet periods.

Relative humidity is projected to rise at a statistically significant rate of 0.08% per decade, with an average value of 78.53% for 2015–2035 and a 95% confidence range of 78.43% to 78.63%. By 2020–2050, relative humidity is expected to reach 78.64%, reflecting a slightly wetter atmospheric condition despite the overall increase in dry spells and drought risk.

Future climate projections for Ha‘apai indicate a statistically significant warming trend across maximum, mean, and minimum temperatures. The mean maximum temperature is expected to rise by 0.1475°C per decade, with an average value of 26°C from 2015 to 2035 and a 95% confidence range of 25.74 to 25.87°C. By 2020–2050, the mean maximum temperature is projected to remain at 26°C, signalling a steady increase.

The mean average temperature shows a similar trend, increasing at 0.15°C per decade, with an average of 25.23°C during 2015–2035 and a confidence range of 25.17 to 25.29°C. By 2020–2050, it is projected to rise to 25.4°C, reflecting a significant warming of the overall climate.

Minimum temperatures are also expected to rise at 0.15°C per decade, with an average of 24.65°C for 2015–2035 and a confidence range of 24.58 to 24.71°C. The projected value for 2020–2050 is 24.82°C, indicating warmer nights and a narrowing range between daily temperature extremes.

Future climate projections for Ha‘apai indicate significant changes in extreme temperature parameters, with notable increases in warm spells and summer days. The Warm Spell Duration Index is expected to rise sharply at a rate of 26.55 days per decade, with an average of 46.08 days from 2015 to 2035 and a 95% confidence range of 38.69 to 53.47 days. By 2020–2050, the duration of warm spells

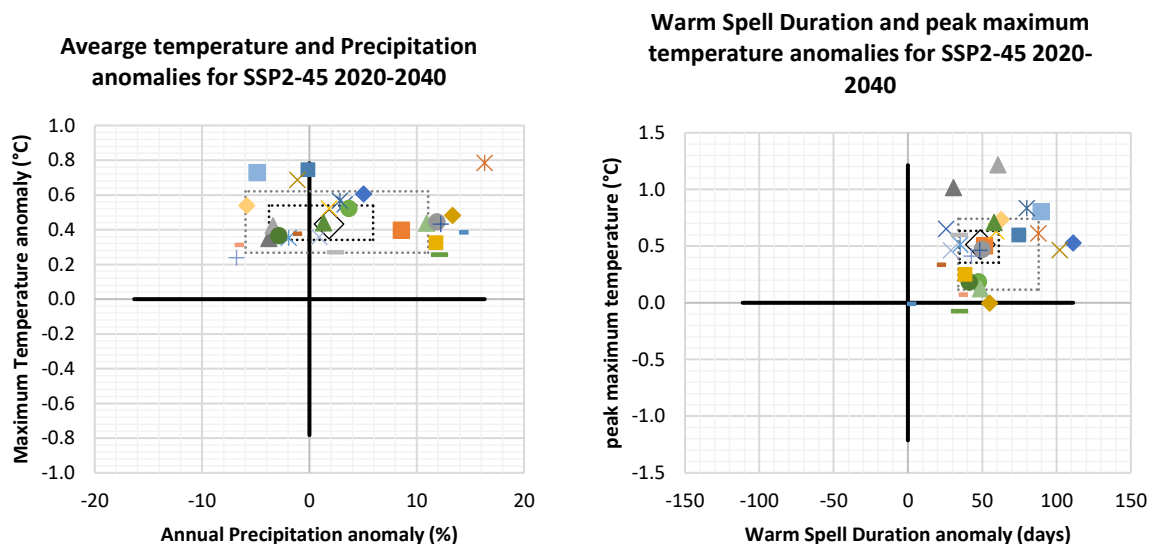


is projected to increase significantly to 73.8 days, reflecting a statistically significant trend toward prolonged heat events.

The number of summer days exceeding 25°C is projected to increase by 9.6 days per decade, with an average of 244.37 days annually and a confidence range of 239.33 to 249.42 days. By 2020–2050, this is expected to rise to 256.14 days per year, indicating more frequent warm days. However, extreme heat thresholds of 35°C and 40°C are not expected to increase, as no days above these temperatures are projected for 2015–2035 or 2020–2050.

Peak maximum daily temperatures show a statistically significant increase of 0.16°C per decade, with an average value of 28.7°C and a confidence range of 28.63 to 28.77°C. By 2020–2050, peak single-day temperatures are projected to reach 28.89°C. Similarly, the lowest minimum daily temperatures are expected to rise by 0.14°C per decade, with an average of 20.67°C for 2015–2035, increasing to 20.85°C by 2020–2050.

Tropical nights, defined as nights with temperatures above 20°C, are effectively constant, with nearly all nights meeting this criterion (average 364.98 nights per year), but the trend shows a statistically significant increase in consistency. These projections highlight a future for Ha‘apai with longer warm periods, more frequent summer days, and increased intensity in temperature extremes, posing challenges for heat management and ecosystem stability.





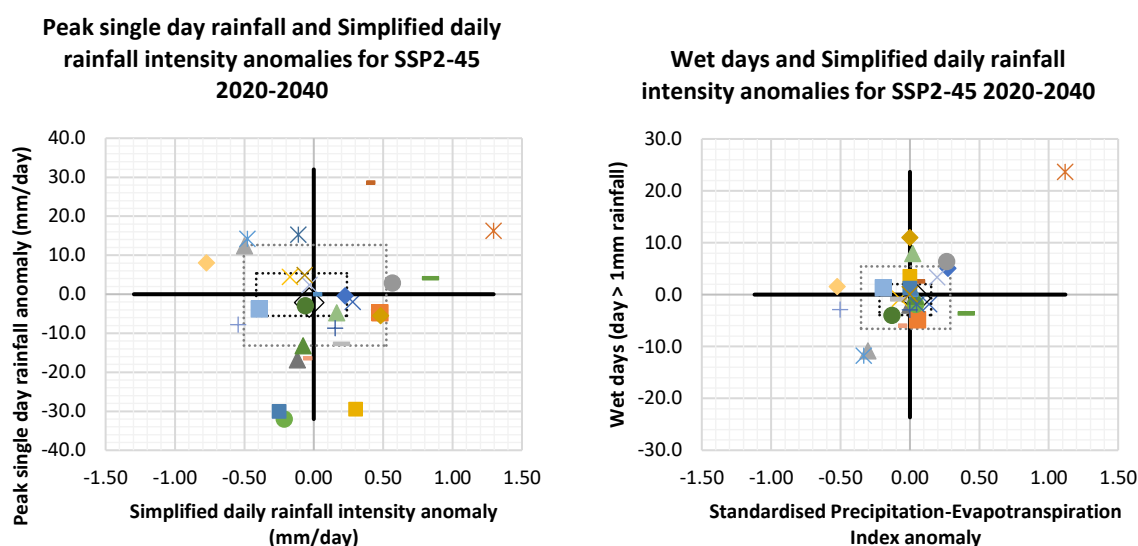


Figure 4-12. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

#### Vava'u

Future climate projections for Vava'u indicate modest changes in rainfall and extreme rainfall events, with most trends not statistically significant. Mean annual rainfall is projected to decline by -0.4% per decade, equivalent to a decrease of 7.01 mm per decade, with an average of 1737 mm annually from 2015–2035 and a 95% confidence range of 1699.13 to 1773.92 mm. By 2020–2050, the projected annual rainfall is expected to stabilize at 1740 mm/year.

The number of days with more than 20 mm of rainfall is expected to decrease slightly at a rate of -0.06 days per decade, averaging 19.01 days annually with a 95% confidence range of 18.22 to 19.8 days. However, this decline is not statistically significant. Conversely, the number of days with rainfall exceeding 50 mm is projected to see a small, not statistically significant increase of 0.02 days per decade, with an average of 2.57 days per year and a confidence range of 2.32 to 2.82 days.

Extreme rainfall magnitudes show minor increases that are also not statistically significant. Single-day peak rainfall is projected to rise by 0.39 mm per decade, with an average value of 69.66 mm and a confidence range of 67.85 to 71.48 mm. Similarly, the five-day peak rainfall is expected to increase by 0.23 mm per decade, with an average of 169.6 mm and a confidence range of 164.15 to 175.06 mm. Peak monthly rainfall is projected to rise by 0.07 mm per decade, with an average of 343.17 mm and a confidence range of 335.16 to 351.18 mm.

Overall, while Vava'u's rainfall patterns may show slight declines and minor increases in extremes, the trends are generally not statistically significant, indicating a relatively stable rainfall regime with only gradual changes projected over the coming decades.

Future climate projections for Vava'u indicate significant changes in drought frequency and moisture levels, alongside minor shifts in dry and wet spells. The Standardised Precipitation Evapotranspiration Index (SPEI), a key drought indicator, shows a statistically significant decrease of -0.02 SPEI per decade, with an average value of 0.09 and a 95% confidence range of 0 to 0.19. This trend signals an increased likelihood of more severe and frequent droughts in the future.

Consecutive dry days are projected to increase slightly by 0.08 days per decade, with an average of 13.2 days annually and a confidence range of 12.79 to 13.6 days, although this trend is not statistically significant. Conversely, consecutive wet days are expected to decrease minimally by -0.02 days per decade, averaging 27.94 days per year with a confidence range of 26.93 to 28.94 days, also not statistically significant.

Relative humidity is projected to rise at a statistically significant rate of 0.08% per decade, with an average value of 79.44% for 2015–2035 and a confidence range of 79.34% to 79.54%. By 2020–2050, relative humidity is expected to reach 79.55%, indicating a modest increase in atmospheric moisture despite the heightened risk of drought.

Future climate projections for Vava'u indicate a consistent and statistically significant warming trend across maximum, mean, and minimum temperatures. The mean maximum temperature is projected to increase by 0.1475°C per decade, with an average value of 26°C for 2015–2035 and a 95% confidence range of 26.29°C to 26.41°C. By 2020–2050, the mean maximum temperature is expected to reach 27°C, signalling a gradual warming of daytime conditions.

The mean average temperature is also projected to rise at 0.15°C per decade, with an average of 25.75°C during 2015–2035 and a confidence range of 25.69°C to 25.82°C. By 2020–2050, the mean temperature is expected to reach 25.94°C, reflecting an overall warming trend in Vava'u's climate.

Minimum temperatures show a similar trend, increasing by 0.15°C per decade. The average minimum temperature for 2015–2035 is projected at 25.15°C, with a 95% confidence range of 25.09°C to 25.22°C. By 2020–2050, the minimum temperature is expected to rise to 25.34°C, indicating consistently warmer nights.

Future climate projections for Vava'u show significant changes in extreme temperature parameters, with warming trends evident across various metrics. The Warm Spell Duration Index is projected to increase dramatically at a rate of 29.07 days per decade, with an average of 50.22 days from 2015–2035 and a 95% confidence range of 43.4 to 57.04 days. By 2020–2050, warm spells are expected to last an average of 83.93 days, indicating a statistically significant increase in prolonged heat events.

The number of summer days, defined as days with temperatures above 25°C, is also projected to rise by 7.3 days per decade, averaging 296.75 days annually with a confidence range of 291.17 to 302.33 days. By 2020–2050, the number of summer days is expected to increase to 307.98 days per year. However, there are no projected increases in the number of days exceeding 35°C or 40°C, which remain at zero for both 2015–2035 and 2020–2050.

Peak single-day maximum temperatures are expected to increase by 0.16°C per decade, with an average value of 28.9°C from 2015–2035 and a confidence range of 28.83°C to 28.96°C. By 2020–2050, peak single-day temperatures are projected to reach 29.1°C, a statistically significant increase. Similarly, the lowest daily minimum temperatures are expected to rise by 0.14°C per decade, with an average of 21.51°C from 2015–2035, reaching 21.7°C by 2020–2050.

Tropical nights, or nights with temperatures above 20°C, remain consistent at 365 nights annually, showing no variation over the decades. These trends reflect a future in Vava'u with prolonged warm spells, more frequent summer days, and higher daily temperature extremes, signalling potential challenges for ecosystems, agriculture, and community well-being.

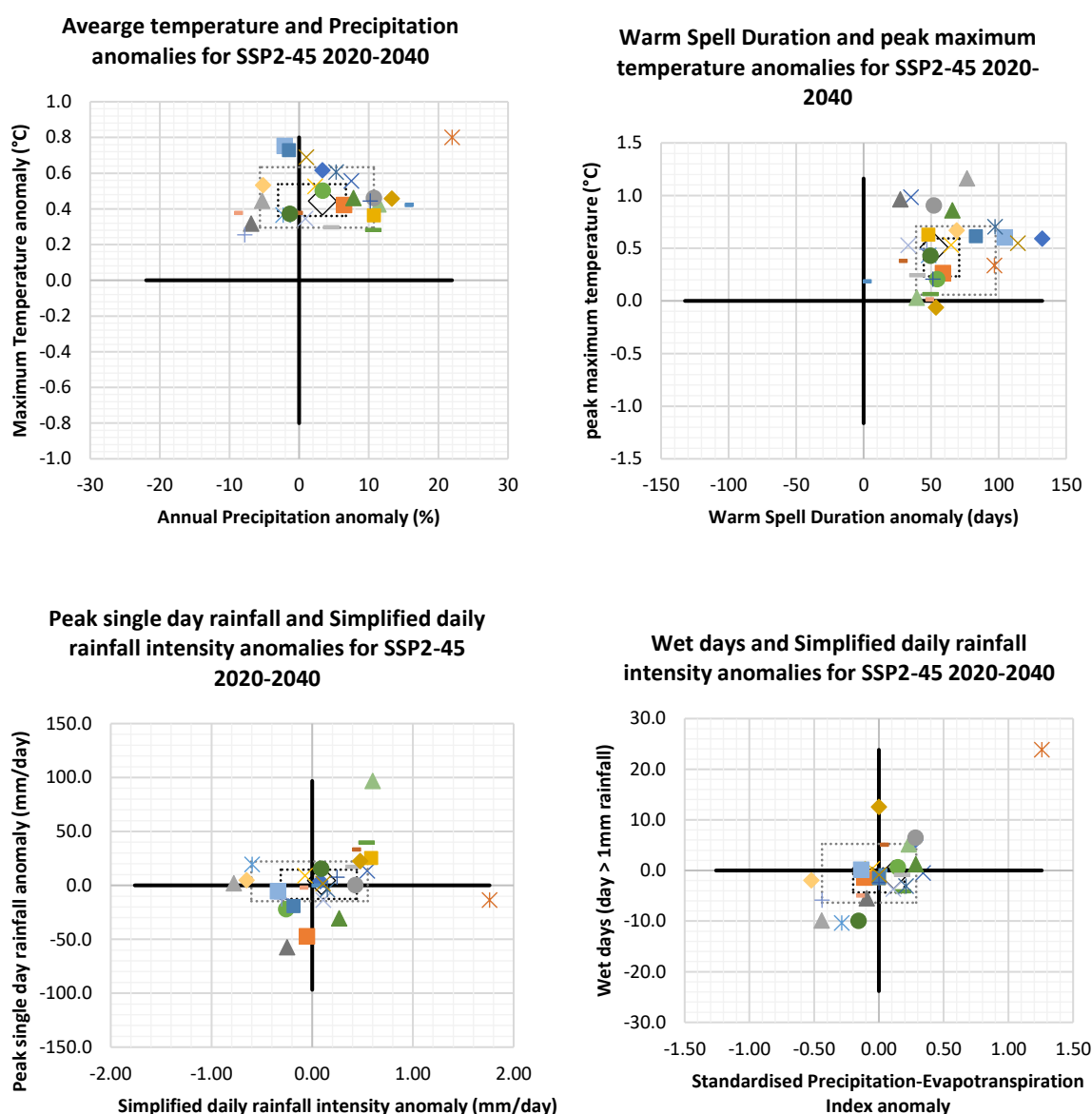


Figure 4-13. Focus area biplots. Maximum temperature vs annual rainfall (top left), Warm spell duration vs Peak maximum temperature (top right), Peak single day rainfall vs average rainfall intensity (bottom left), and SPEI vs number of wet days (bottom right)

#### 4.2.4 Climate vulnerability, impacts and school safety

Tonga's education is highly susceptible to disruption due to climate induced and natural hazards. Extreme weather events such as tropical cyclones, flooding, and heatwaves as well as slow onset events such as sea level rise have the potential to impact Tonga's educational sector directly, via deaths and injuries, psychosocial harm/mental distress and damage to school infrastructure, facilities and materials, and educational disruption. The impact of tropical cyclones Gita (2018) highlighted the vulnerability of the education sector in Tonga and the need to strengthen its resilience to avoid similar impacts in the future. Tropical cyclone Gita damaged 109 out of the 150 schools (72% of all schools)

on the main island of Tongatapu and left around 23,000 children without education.<sup>375</sup> Three months after the cyclone, nearly 1,200 students continued to attend classes in tents. Many schools operated with inadequate WASH facilities such as toilets and running water and many classrooms and WASH facilities needed repair, retrofitting, and reconstruction to higher engineering and more resilient standards.<sup>376</sup> Tropical cyclone Gita cost the Tongan education sector USD 19 million.<sup>377</sup> In April 2020, tropical cyclone Harold disrupted the education of 47,500 children across four Pacific Island countries, including Tonga.<sup>378</sup>

Tonga's education sector is and will continue to be also indirectly hit by climate-related hazards. For example, in 2023 a Tonga Meteorological Service Drought Report noted that Niuafu'ou, Niuatoputapu, Vava'u, Ha'apai, Fua'amotu, Nuku'alofa, and 'Eua Islands divisions are susceptible to drought as a result of the drought percentile values recorded. Drought alerts were reported for Niuafu'ou and Niuatoputapu, having recorded 59.1 and 49.3 respectively. Drought warnings were reported for Ha'apai and Vava'u, having recorded 32.8 and 26.6 respectively. Fua'amotu, Nuku'alofa, and 'Eua Islands divisions were declared as drought areas, having recorded 9.3, 7.6 and 4.7 respectively.<sup>379</sup> These drought events are likely to negatively affect the food and water security of children, impacting their concentration and learning capacity and potentially the financial capacity of their parents to pay for school fees.

Recent modelling by the World Bank estimated that past disasters, including climate-induced disasters, cost the Tongan education sector on average USD 7.38 million per year, the equivalent of 1.5% of Tonga's GDP.<sup>380</sup>

Climate stressors also impact Tonga's education indirectly via an increase in absenteeism, drop-outs, and negative impacts on families' livelihoods, food security, health, and income as well as the wellbeing and security of children. For example, changing precipitation, increasing temperatures, natural resource degradation, increase in pests, and extreme weather events will likely lead to declines in local agricultural and fisheries. This impacts people's food security and livelihoods and potentially leads to stress in families. The projected heatwaves and increasing temperatures in Tonga are likely to negatively impact health and well-being.

A recent climate and non-climate driver multi-hazard risk assessment by the World Bank's Road Map to School Safety Study found that 92% of the school building portfolio (covering 1,034 school buildings) is at high risk to at least one hazard event and required immediate intervention to reduce risks caused by high winds, floodings, earthquakes, and tsunami. The assessment also found there are no buildings at very high risk. Approximately half of the building portfolio is at high risk of tsunami. Flooding and liquefaction risks are localised, relating to individual buildings. The assessment indicates that annual average losses of approximately USD 3.14 million from wind and USD 1.45 million from flooding can be expected in the existing school infrastructure portfolio of both government and non-government primary, middle, and secondary schools.<sup>381</sup> The total replacement costs of these assets have been estimated at USD 260.2 million. The analysis estimated that if no interventions were undertaken the disaster costs for the education sector would be USD 23 million and 400,000 student days lost over the next 30 years. Supported by the World Bank, a major effort is underway to retrofit school buildings

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<sup>375</sup> Plan Australia (2023) *From Crisis to Classroom*. Available [here](#). And World Bank (2020) *Stronger schools and brighter futures in Tonga*. Available [here](#).

<sup>376</sup> World Bank (2021). Project appraisal document on for Tonga Safe and resilient schools Project. Available [here](#).

<sup>377</sup> Plan Australia (2023) *From Crisis to Classroom*. Available [here](#).

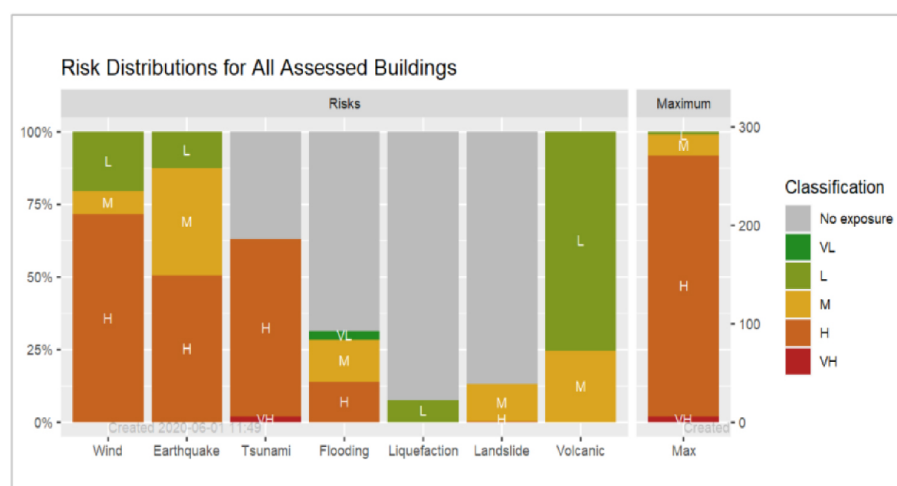
<sup>378</sup> Ibid.

<sup>379</sup> [Drought conditions in Tonga](#)

<sup>380</sup> Ibid.

<sup>381</sup> World Bank (2021). Project appraisal document on for Tonga Safe and resilient schools Project. Available [here](#).

to reduce these risks.<sup>382</sup> The report also includes hazard maps for all 108 government schools assessed showing their exposure to each of the 7 hazards. In agreement and consultation with the government, the same dataset has been used to select the schools for BRACE activities related to output 1.2, focusing specifically on climate-related hazards (flooding and wind). For more information see section on site-selection.



Source: World Bank, 2020.

### Climate and non-climate driven critical risk type distribution for all Tonga's school buildings<sup>383</sup>

#### Data utilised

Climate data was based on the CMIP6 SSP2-4.5 climate scenario. The CMIP6 project expands on previous phases of the Coupled Model Intercomparison Project (CMIP), which have provided valuable information on the past and future evolution of the Earth's climate system. This analysis is based on CMIP6 data, which includes 134 models from 53 modelling centres. The publication of CMIP6 data began in 2019, with the majority of the data by 2022, with CMIP6 scientific analyses used in the IPCC's 6th Assessment Report (AR6).<sup>384</sup>

- WorldClim: WorldClim data is a set of bias-corrected, high-resolution, downscaled climate models that can be used for detailed spatial analysis of an area's climate changes. The data used has a downscaled resolution of ~10km and presents a temporal average of the climate from 2021-2040 representing the near-term projection.<sup>385</sup>
- The Climate Change Knowledge Portal (CCKP): the CCKP is a hub for climate-related information, data, and tools which provides an online platform from which to access and analyse comprehensive data related to climate change and development. The data used has a downscaled resolution of ~50km and presents a temporal average of the climate from 2020-2039 representing the near-term projection.<sup>386</sup>

<sup>382</sup> World Bank. Tonga Safe and Resilient Schools Project. Available [here](#). And World Bank. Pacific Safer Schools Program (PSSP): Pacific Safer Schools Pacific Roadmap Technical Assistant. Available [here](#). And World Bank (2022) US\$19 Million for Safer Schools and Improved Emergency Early Warning Systems in Tonga. Available [here](#).

<sup>383</sup> Ministry of Education and Training (2023) *Education Sector Analysis*

<sup>384</sup> ECMWF, CMIP6 climate projections and information.

<sup>385</sup> Hijmans, R.J., S.E. Cameron, J.L. Parra, P.G. Jones and A. Jarvis, 2005. Very high-resolution interpolated climate surfaces for global land areas. *International Journal of Climatology* 25: 1965-1978

<sup>386</sup> World Bank Group, Climate Change Knowledge Portal (2024). URL: <https://climateknowledgeportal.worldbank.org/>

- Copernicus Climate Change Service (C3S): This dataset provides aridity indicators useful for climate and vegetation interaction assessment.<sup>387</sup>
- Köppen-Geiger climate classification: Maps present global maps of the Köppen-Geiger climate classification at a high resolution for historical and future climate conditions. The data used has a downscaled resolution of 1km and presents a temporal AVERAGE of the climate from 2041-2070 representing the medium-term projection.<sup>388</sup>
- Climate research unit (CRU) data 4.06 release. The CRU TS dataset was developed and has been subsequently updated, improved, and maintained with support from several funders, principally the UK's Natural Environment Research Council (NERC) and the US Department of Energy. Long-term support is currently provided by the UK National Centre for Atmospheric Science (NCAS), a NERC collaborative centre.<sup>389</sup>

### 4.3 Adaptation Gaps and Actions

This section provides detailed information about climate adaptation gaps and limitations in the education system and the adaptation actions identified to address the gaps. To identify the adaptation gaps and actions, the team looked at:

- The climate vulnerability, which is a function of exposure to climate variability and hazards, sensitivity to that variability and those hazards, and the adaptive capacity of habitats, ecosystems, populations and/or social structures.
  - Exposure: the situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.<sup>390</sup>
  - Sensitivity: this is determined by the physical, social, economic and cultural characteristics of an ecosystem or community and their responses to change.
  - Adaptive capacity: this refers to the ability of an ecosystem or community to anticipate and manage the impacts of climate change and continue to have positive outcomes under the new realities.
- The climate change driver, hazards, vulnerabilities and impacts
- Existing and planned projects.

Building on the Comprehensive School Safety Framework<sup>391</sup>, exposure, sensitivity and adaptive capacity gaps will be identified with regards to: 1) school facilities, 2) school safety and educational continuity management systems, and 3) embedding of climate change in education. The first aspect relating to school infrastructure depends on each school building's location, surrounding, condition, and maintenance and requires an assessment of Tonga's school buildings. Similarly school safety and educational continuity management systems depend on the availability, or lack of, these systems or its quality according to location. The embedding of climate change in education can be determined at national level.

<sup>387</sup> Nobakht, M., Beavis, P., O'Hara, S., Hutjes, R., Supit, I., (2019): Agroclimatic indicators from 1951 to 2099 derived from climate projections. Copernicus Climate Change Service (C3S) Climate Data Store (CDS). DOI: 10.24381/cds.dad6e055

<sup>388</sup> Beck, H.E., T.R. McVicar, N. Vergopolan, A. Berg, N.J. Lutsko, A. Dufour, Z. Zeng, X. Jiang, A.I.J.M. van Dijk, D.G. Miralles. High-resolution (1 km) Köppen-Geiger maps for 1901–2099 based on constrained CMIP6 projections. Scientific Data 10, 724, doi:10.1038/s41597-023-02549-6 (2023)

<sup>389</sup> Harris, I., Osborn, T.J., Jones, P. et al. Version 4 of the CRU TS monthly high-resolution gridded multivariate climate dataset. Sci Data 7, 109 (2020). <https://doi.org/10.1038/s41597-020-0453-3>

<sup>390</sup> UNDRR. Sendai Framework Terminology on Disaster Risk Reduction. Available [here](#)

<sup>391</sup> Comprehensive School Safety Framework 2022-2030. Available [here](#)

#### 4.3.1 Vulnerability of school facilities to climate-related risks

In agreement with the Tongan government and the World Bank, the exposure and vulnerability of school facilities to climate-related risks have been determined based on World Bank's report *Strengthening the Resilience of Public Facilities in Samoa, Tonga, and Vanuatu (SRPF) – Final Report on the Assessment of Schools in Tonga*.<sup>392</sup> This assessment has been conducted by a consortium of international and local partners and led by the Italian company RED whose personnel has up to 20 years of experience in disaster risk modelling and management as well as coordinating large-scale international projects. The assessment included 1034 school buildings in the provinces Tongatapu, Vava'u, Ha'apai, and 'Eua, excluding the schools in Niua's.

The assessment identified the following exposure and sensitivity of each individual school in the dataset:

##### **Exposure:**

- Past events that impacted the schools (cyclone, flooding, earthquakes (non-climate driver noted))
- Terrain of surrounding area (coastal plains, foothills, mountainous, swampy, valley floor)
- General topography (sloping site, flat)
- Distance to river and sea
- Proximity to unsafe structure, including large trees, vulnerable buildings, and detachable roof cladding.

##### **Sensitivity:**

- If a building has been retrofitted against cyclone damage
- General level of maintenance (poor, fair, good, very good)
- Upgrade/maintenance needs (corroded roof sheeting, window/coverings in poor conditions, timber elements needing treatments, deteriorated façade, roof leakages, insufficient roof fixings, insufficient/deteriorated connections)
- Building condition (poor, fair, good, very good)
- Access to/lack of water supply
- Access to/lack of electricity
- Number of students (per gender as well as students with special needs) and average number of students per day with attendance rate.

Finally, to identify the climate vulnerability of a school, we looked at the Average Annual Loss Ratio (AALR) to investigate the damage of a potential climate hazard. The AALR refers to the Average Annual Loss divided by the total replacement value. The World Bank's assessment covered both climate-related disasters such as wind (indicating tropical cyclones and storm surges) and floods and non-climate related disasters such as earthquakes and volcanic eruptions. For the BRACE project and in consultation with the World Bank and the consultants, the AALR was specifically recalculated for climate-related disasters such as storms and cyclones (wind) and flooding, to identify the climate vulnerability of schools.

In general, the assessment showed a diverse picture of the climate vulnerability of the 1,034 schools covered by the assessment. Assessing the climate vulnerability against existing and planned projects,

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<sup>392</sup> World Bank and RED Risk Engineering + Development (2022) *Strengthening the Resilience of Public Facilities in Samoa, Tonga, and Vanuatu (SRPF) – Final Report on the Assessment of Schools in Tonga*.



the following adaptation gaps were identified at school infrastructure level for specific school buildings:

- School locations and surrounding exposed to climate-related hazards as well as unsafe structures
- Remoteness and isolation of schools
- Poor general maintenance and building conditions leading to unsafe school infrastructure
- Unsafe surroundings
- Lack of access to clean and high-quality water and electricity
- Little/no investments to improve school infrastructure and surroundings.

These adaptation gaps lead to high levels of risk for students in schools as well as high potential for damage and high recovery costs from climate related hazards identified in the climate context section: cyclones, flooding, sea level rise and water insecurity.

#### 4.3.2 School safety and educational continuity management systems

Given the varied levels of exposure and sensitivity of Tongan schools and the high climate risks for vulnerable schools, there is a strong need for school safety, educational continuity management and other systems. This includes child protection systems where teachers can safely recognise and refer child protection issues and vulnerabilities. Significant efforts in Tonga have been made around school safety and educational continuity management such as the publishing of the School Safety and Resilience Handbook, the setup of the HAMA e-learning Platform, the setup of a national school safety and resilience coordination committee and investments in CIS and EWS. However, the roll-out and coverage of these systems, tools, and coordination mechanisms have been limited. For example, according to World Bank data at least 651 schools of 1034 schools did not have a school emergency preparedness plan (115 did not answer the question) and at least 632 schools did not engage in emergency drills (115 did not answer the question). The actual number is likely to be higher, considering the dataset did not include all schools. This shows the need for disaster preparedness and awareness. Similarly, during consultations as part of BRACE design it was raised that schools do also not always have the resources to implement disaster plans. Also, access to CIS and EWS is very limited at various schools, especially those located on remote outer islands, and schools often lacked the knowledge to act upon the information provided through them.

Finally, consultations revealed that, although not ideal, schools are sometimes the safest place during a disaster and therefore fulfill the function of an evacuation centre. However, schools are often ill-prepared to be evacuation centres and are not able to continue education for a long periods following the evacuation.

Therefore, the following adaptation gaps were identified:

- Lack of access to CIS and EWS and lack of CIS and EWS usage in decision-making in school
- Lack of school disaster awareness and planning (including drills)
- Lack of resources to implement school disaster plans
- Schools are ill-prepared to be an evacuation centre.

#### 4.3.3 Climate change embedded in education

The TSRSP and CCCPIR have made investments to embed and integrate climate change in Tonga's current curricula. However, consultations with MET and MEIDECC pointed to the need for a specific climate change elective that covers gaps around climate science, finance, and knowledge and encourages students to enter into adaptive livelihoods as well as climate-related jobs (including green jobs, climate research, disaster preparedness, and environmental engineering).

Other points that became apparent during consultations with MET were the need to strengthen the HAMA e-Learning Platform, ensure the updated curriculum integrating climate change is recorded, and embed the climate change elective course developed by BRACE. This will support the continuation of climate-related topics during a disaster (also relating to educational continuity) as well as support overburdened teachers who work in schools.

The following adaptation gaps were identified:

- Lack of climate-related curricula on HAMA e-learning platform
- Lack of climate change courses for secondary schools that connect well with the job-market.

#### 4.3.4 Adaptation Actions

Based on the gaps identified in the previous sections, various adaptation actions were identified (see table below).

It should be noted that due to the current GCF ESS Category C accreditation of Save the Children Australia, Save the Children is not able to relocate or build new buildings. Other existing and planned projects, including TSRSP, will be able to deliver this aspect. BRACE will prevent duplication of TSRSP's retrofitting, relocating, and construction of new school infrastructure and will build on the update of Tonga's curriculum by the Tonga Government through support of TSRSP.

**Table: Identified adaptation action to minimise the climate vulnerability of schools in Tonga. The full suite of adaptations includes those outside the scope of BRACE (in grey) that maybe be implemented by complementary projects or be achieved as co-benefits of BRACE**

| ADAPTATION ACTIONS: REDUCING DRIVERS OF VULNERABILITY TO CLIMATE CHANGE HAZARDS AND IMPACTS                                |  |  |                          |  |  |  |  |  |  |
|--|--|--|--------------------------|--|--|--|--|--|--|
| Reducing exposure  |  |  | Minimising vulnerability |  |  | Building adaptive capacity                                     |  |  |  |
| Historic exposure to climate hazards   | Isolation/ Lack of connectivity and access to climate and disaster information | School infrastructure close to river, exposed shoreline, area prone to landslides  | Unsafe surrounding       | Unsafe school infrastructure, poor condition and maintenance                             | Lack of access to clean water and electricity in schools | Lack of disaster preparedness planning and awareness at school | Lack of education continuity methods in case of climate-related disaster   | Lack of teachers or capacity of teachers | Lack of specific practical climate change curriculum                     |
| Strengthen school access to early warning systems and climate information services   |  | Coastal protection barriers and protection barriers from river and landslides using nature-based solutions (could be part of school disaster planning) |                          | Upgrade and retrofit school infrastructure   | Upgrade and retrofit WASH facilities                     | School safety training   | Strengthen existing HAMA e-learning platform to ensure continuation of education as well as spreading climate change education |  |  |
| Support local and district school authorities, MET and MEIDECC to monitor and evaluate CC and DRR policies at school level | Increase connectivity and access to national and local media (including radio) | Coastal protection and protection infrastructure from the river and landslides   |                          | Relocate/build new school infrastructure (not possible due to current ESS accreditation) | Install solar panels                                     | School disaster planning                                       |  |  | Develop climate change elective course aligning with climate jobs market |
|  | Together with  |  |                          | Training on basic upkeep and maintenance of school                                       |  | Emergency drills   | Offer alternative  |  | Record elective in Hama e-   |

|  |  |  |  |                                    |  |  |  |  |   |
|--|--|--|--|------------------------------------|--|--|--|--|---|
|  | MEIDECC develop and distribute CIS and EWS materials |  |  | infrastructure and WASH facilities |  |  | classrooms and educational materials in case of climate-related disaster |  | learning platform   |
|  | Training in use of CIS and EWS                       |  |  |                                    |  | Recording of disaster preparedness training in e-learning platform |  |  | Mainstreaming of climate change in current curriculum (currently done by TSRSP) |

#### 4.4 Project description

The main climate drivers that pose a risk to Tonga's education sector are sea level rise, increasing temperatures, and changing rainfall patterns leading to increasing extreme weather events. These drivers and hazards impact the education sector directly via deaths and injuries, psychosocial harm/mental distress, and damage to school infrastructure, facilities and materials, and educational disruption and indirectly, via an increase in absenteeism, drop-outs and negative impacts on families' livelihoods, food security, health and income as well as the wellbeing, safety and protection of children.

The BRACE project aims to strengthen the climate resilience of the education sector by helping to reduce and avoid significant impacts on educational assets, children and access to learning. The project will implement an integrated set of activities aimed at increasing the adaptive capacity of children and youth through mainstreaming of climate change into educational curricula, increasing accessibility to climate education through e-learning, and investments in increasing the physical resilience of school buildings and infrastructure in outer islands. The project will also work with schools and the education sector to improve accessibility to climate information and e-learning. It will also engage in preparedness through training and materials designed appropriately to the local context to improve climate and disaster resilience planning in the education sector.

The project is aligned with Tonga's Strategic Development Framework 2015-2025,<sup>31</sup> Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management (JNAP II) 2018-2028,<sup>32</sup> Climate Change Policy,<sup>33</sup> Third National Communication,<sup>34</sup> and Second National Determined Contribution<sup>35</sup>, and the Tonga Education Policy Framework.<sup>36</sup> This also provides the institutional framework for adaptation and resilience building, and sectoral development plans, strategies, and priorities.

BRACE paradigm shift goal statement from the Theory of Change (ToC) is:

**IF** the education stakeholders in Tonga are better informed of climate risks and adaptation options for the education sector, as well as have access to global knowledge, policy exchange and financing, and **IF** the target schools are teaching children about climate change and become safer and greener, **THEN** the school systems of the target countries and beyond, including children and communities, become more resilient, **BECAUSE**, policies of the education sector becomes more responsive to climate change, there will be increased climate finance for the sector, Ministry of Education staff, students and communities will become more knowledgeable and engaged in climate adaptation actions and advocacy.

**Outcome 1: The education sector at national and sub-national levels in targeted countries is more resilient to the impacts of climate change.**

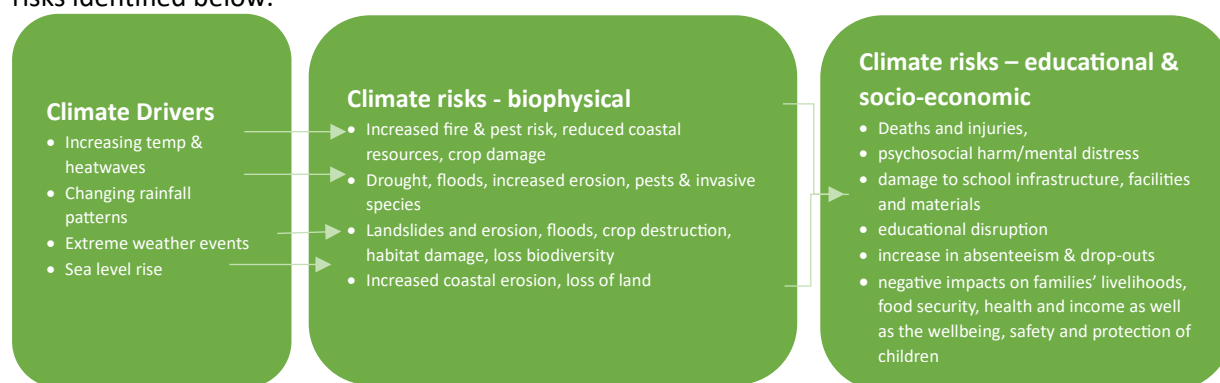
BRACE's key barriers in Tonga that prevent the education sector from adequately addressing the main climate drivers are:

- **Gender and social inclusion:** are critical considerations in climate adaptation planning and education, particularly for women, children and youth, across their diverse identities, who are disproportionately affected by the climate crisis. Tongan society's traditional gender roles can hinder decision-making processes, leading to differentiated vulnerabilities for marginalized groups including children, youth, women, and people with disabilities. Women's limited access to information systems exacerbates their vulnerability to natural hazards. Addressing family and domestic violence is essential for achieving gender equality and empowering women in Tonga.
- **Financial:** schools and the education sector lack necessary finance to resource the adaptive actions required for strengthening climate resilience. Low students and teacher numbers in some schools in outer islands hampers cost effectiveness and leads to a scattering of financial resources. Additionally, there are low incentives for private sector entities to engage with

remote schools in outer islands to support increased market access and diversification of livelihoods.

- **Institutional:** institutional capacity gaps at local, sub-national, and national levels hamper effective adaptation planning processes and implementation of adaptation actions.
- **Technological:** schools in the outer islands do not have internet connectivity, which limits their access to CIS and EWS, and educational continuity mechanisms such as HAMA e-learning platform.
- **Infrastructural:** school infrastructure in outer islands is often inadequate. The lack of accessible and appropriate classrooms, WASH facilities, and equipment are key barriers to the climate resilience of these schools.
- **Informational:** Limited teaching and learning materials about climate change exist, which impedes climate awareness and knowledge and hampers students' choices for climate-related future studies and jobs demanded by the local and national labour industry. Additionally, there is limited access to relevant, high quality climate information for decision making in the education sector (see also technological).

In the Tongan education sector, these socio-cultural-institutional barriers interact with key climate risks identified below.



Underlying assumptions of the project are:

- Multiple project areas will not be affected simultaneously by significant climate-related and non-climate disasters (e.g. category 5 cyclone, wave action, flood, drought, heatwave, tsunami, earthquake, etc.) during implementation
- Government implementing partners will remain committed to the project throughout the implementation period
- Relevant government departments will facilitate project access to national CIS and EWS systems
- Targeted schools and school staff will remain committed to the project throughout the implementation period.

### Project design description

Through the lens of the CSSF pillars, implementation of project component activities will focus on contributing to the above paradigm statement through achieving the following outcomes and outputs for Component 1:

**Outcome 1: The education sector at national and sub-national levels in targeted countries is more resilient to the impacts of climate change.**

#### **Output 1.2 (CSSF Pillar 1) School Facilities are safer and greener**

This output will directly improve the physical climate-resilience of school and WASH infrastructure to climate change, making school facilities safer and greener. Building on assessments undertaken by the

World Bank in 2019-2021<sup>393</sup>, the project will focus on inclusive infrastructure and WASH retrofits at 7 schools on outer islands in Ha’apai and Vava’u which were identified through a process of consultation and agreement with government ministries. Schools have been prioritised based on the assessed climate risks identified through the World Bank’s consultant Red Risk Engineering and Development’s School Database and the retrofit and improvements that are intended to address these climate risks<sup>394</sup>. Infrastructure retrofits are intended to improve airflow and facilitate natural cooling to address heatwaves; improve drainage, shelter, and accessibility during extreme rainfall events; and resist high windspeeds and flying debris during increasingly severe cyclones. Inclusive WASH retrofits are intended to upgrade existing WASH facilities to better cope with water shortages and flooding related to changing rainfall patterns. These improvements may include water tanks, improvements to water collection infrastructure within schools such as gutters and piping, and sanitation improvements. Special attention will be paid to ensure children with disabilities are able to access school buildings in addition to ensuring WASH facilities meet the requirements of all genders and students with disabilities.

Output 1.2 will also build on previous Outer Island Renewable Energy Project (OIREP) and GCF FP090 Tonga Renewable Energy Project (TREP) and TREP’s feasibility study and assessment of the World Bank on energy supply in schools. It will directly increase schools’ energy efficiency and access to renewable energy, procuring and installing solar PV systems. Renewable energy will be used for internet connectivity and general energy supply for schools e.g. lighting, electronic devices, cooling (fans and air-conditioning). The most energy-efficient equipment and infrastructure will be selected to ensure optimal efficiency in the target schools.

Output 1.2 will also directly increase schools’ internet connectivity, contributing to their access to CIS and EWS (see activity 1.3.5), increasing communication options before, during, and after an emergency, and supporting access to Hama e-learning platform (see activity 1.4.4).

#### **Activity 1.2.2 Retrofit school facilities, including WASH and internet connectivity through PVs, to strengthen climate resilience**

This activity will retrofit school facilities (including WASH) and install internet connectivity and solar PVs to strengthen the climate resilience of the most climate vulnerable schools in Tonga. This activity will conduct a physical infrastructure risk and resilience assessment for targeted schools, which will inform the development and implementation of a physical infrastructure resilience action plan. These plans will be implemented once validated by school representatives and education officials, leading to the upgrading and infrastructure retrofits of school infrastructure and WASH systems.

Simultaneously, a site-specific study will be conducted to identify the best options for internet connectivity based on best practice, experience in outer islands, and opportunities to leverage existing school infrastructure activities and economies of scale. Research will inform the most feasible and sustainable internet connectivity in prioritised schools on outer islands. Existing internet connectivity and access will be identified together with recommended connectivity options (fibre, satellite) and access improvements required to fill gaps. Increased access to internet connectivity will benefit access to CIS and EWS (see activity 1.3.5). Solar PV systems will enable internet connectivity and general energy supply needs for lights, electronic devices, and cooling, etc. Post-emergency studies in Tonga on connectivity challenges recommended investment in more resilient internet infrastructure including the rapid rollout of satellite internet. It was also recommended to devote more funding to the management of resilient internet infrastructure as a public good in order to close the global digital

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393 World Bank- Red Risk Engineering Development (release May 2022) School Database – Strengthening the Resilience of Samoa, Tonga and Vanuatu, Red Risk Engineering and Development: 2021.

394 World Bank- Red Risk Engineering Development (release May 2022) School Database – Strengthening the Resilience of Samoa, Tonga and Vanuatu, Red Risk Engineering and Development: 2021.



divide.<sup>395</sup> Based on the site-specific study, solar PV systems and internet connectivity will be installed at the targeted schools.

**Sub-activity 1.2.2.1.c** Physical infrastructure risk and resilience assessment undertaken (WASH, cycle resilience, airflow) in collaboration with World Bank work

**Sub-activity 1.2.2.2.c** Physical infrastructure resilience action plan developed and validated by school representatives and education officials

**Sub-activity 1.2.2.3.c** School WASH systems upgraded and infrastructure retrofits actioned to increase climate resilience.

**Sub-activity 1.2.2.4.c** Undertake internet connectivity option research for targeted schools.

**Sub-activity 1.2.2.5.c** Installation of identified internet connectivity and solar PV systems in schools in outer islands.

### **Activity 1.2.3 Strengthen school communities and education officials to operate and maintain school infrastructure and facilities**

To prevent and address common issues experienced by school infrastructure (including WASH facilities and PVs) that undermine the climate resilience of facilities, trainings on basic upkeep and maintenance will be provided to school focal points. Examples of common issues are deteriorated WASH facilities, poor ventilation, and sea spray corrosion leading to structural weakness. Common basic upkeep and maintenance issues, identified through the World Bank infrastructure assessment, will form the basis of a package. Capacity building and training using existing World Bank materials (e.g. maintenance videos) will take place, along with addressing any additional priorities identified. Adult micro learning packages will be developed in consultation with school staff, MET office staff, and local subject matter experts focused on action-oriented identification of problems and implementing solutions. These are likely to include a wider range of topics including water system maintenance or common troubleshooting topics such as changing a washer, fixing a tap, or clearing gutters to ensure rainwater collection efficiency.

Additionally, school focal points will also be trained in solving problems of common issues with internet connectivity. Basic training for school maintenance staff and school climate-resilient focal points is intended to promote efficient use and support the sustainability of internet connectivity. Delivery will be based on cost-effectiveness and will likely be an in-person training at time of installation and a video for refresher training. Other disaster preparedness materials will promote basic awareness and information on maintenance requirements for servicing and management of the internet to ensure sustainability of the systems.

**Sub-activity 1.2.3.1.c** Design training and deliver workshops to focal points in schools in outer islands on basic operations and maintenance of school infrastructure, WASH facilities, and PVs to address common issues that compromise climate proofing ability

**Sub-activity 1.2.3.2.c** Record training on basic upkeep and maintenance HAMA e-learning platform

**Sub-activity 1.2.3.3.c** Roll-out and promotion of HAMA e-learning training on basic upkeep and maintenance

**Sub-activity 1.2.3.4.c** Development and recording video training activities on problem solving for internet connectivity for HAMA e-learning platform.

**Sub-activity 1.2.3.5.c** Roll-out and promotion of HAMA e-learning Training on problem solving for internet connectivity

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<sup>395</sup> Stokel-Walker, C. (2022) "Tonga's Volcano Cut it off from the World. Here's What it would take to get it Reconnected", *MIT Technology Review*, January 18, 2022. Accessed at: <https://www.technologyreview.com/2022/01/18/1043790/tongas-volcano-internet-reconnected/>

### ***Output 1.3 (CSSF Pillar 2) School safety and educational continuity management systems are operating effectively***

Building on the increased connectivity of activity 1.2.2, this output will increase and promote access to and use of EWS and CIS. This output includes developing and distributing EWS and CIS products and materials to inform school-based climate-resilient school safety and increasing availability of climate information. This will ensure that EWS and CIS reach the targeted schools of output 1.2 and other Tongan schools. To ensure the use of CIS and EWS, 150 school focal points will be trained in 5 regional centres<sup>396</sup> on accessing and using EWS and CIS. This training will be combined with a training on climate resilient school safety for these 150 school focal points, leading to the development and implementation of School Safety and Resilience Plans (SSRPs). The implementation of SSRPs will be supported through the distribution of school climate resilience toolkits. Through the implementation of these plans, schools will be better prepared to manage climate related hazards, such as tropical cyclones, storms and floodings, and will be able to continue education.

#### **Activity 1.3.5 Strengthen access to and use of EWS and CIS in schools**

Building on the increased connectivity in output 1.2, this activity will increase and promote access to and use of EWS and CIS. This activity will collaborate with MEIDECC to develop and distribute CIS and EWS products and materials to schools to support climate resilient school safety and disaster preparedness learning and planning. This output includes developing and distributing EWS and CIS products and materials. School-relevant climate information products will build on existing MEIDECC EWS and CIS materials. and traditional indicators and knowledge. This will ensure the products are useable, accessible, and school-relevant. They will be reviewed, updated, or developed and will be distributed to schools in collaboration with MEIDECC, MET, and other relevant stakeholders.

Building on the products and materials developed, this activity will strengthen the capacity of school climate-resilient focal points in the use of EWS and CIS to inform climate resilient school safety training (activity 1.3.2) and planning (Activity 1.3.3). This will reach the targeted schools of outcome 1.2 as well as other schools. The activity will strengthen the capacity of school climate-resilient focal points in the use of EWS and CIS to inform school climate change adaptation and disaster preparedness and response planning processes. Technical training materials will be prepared that address community needs and are tailored for layperson's understanding of climate and disaster risks. Tailored technical trainings will be facilitated by MEIDECC, MET, and the PIU. E-learning refresher modules for HAMA e-learning platform will be developed, recorded, and rolled out to ensure learnings and knowledge will be sustained and can continued to be shared beyond the project life.

***Sub-activity 1.3.5.1.c Workshops in collaboration with MEIDECC to identify CIS and EWS products and materials to be developed***

***Sub-activity 1.3.5.2.c Product and materials development by Communications Manager and local consultant***

***Sub-activity 1.3.5.3.c Distribution and promotion of products and materials in collaboration with MEIDECC***

***Sub-activity 1.3.5.4.c Preparation and technical training material on CIS & EWS.***

***Sub-activity 1.3.5.5.c Deliver technical training on CIS & EWS to 150 participants in 5 of regional centers***

***Sub-activity 1.3.5.6.c Development and recording of E-learning refresher modules on HAMA e-learning platform***

***Sub-activity 1.3.5.7.c Role out and promotion of HAMA E-learning refresher modules.***

#### **Activity 1.3.2 Build knowledge and capacity of school management, teachers and children to prepare climate-related school safety plans**

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<sup>396</sup> The regional centres reflects Tonga's five administrative divisions: 'Eua, Ha'apai, Nuias, Tongatapu and Vava'u.

The activity will provide 150 climate-resilient school focal points with a training on school climate-related school safety in 5 regional centres. This training will build on Tonga's School Safety Handbook<sup>397</sup>, applying a climate-resilient lens to the handbook and will be combined with the training on EWS and CIS building on the products developed in 1.3.5. The school focal points will go through 6 steps: 1) Awareness Raising on Child Rights, Child Protection and Safety, 2) Operationalizing a School Safety Team, 3) Conducting a Multi-hazard School Safety Assessment, 4) Developing School Safety and Resilience Plans, (5) Practicing Safety Measures and Procedures (including drills), 6) Making the School a Hub for Learning and Action. Previous training delivered to focal points by Save the Children was favourably received<sup>398</sup>. Refresher training was highlighted as a need for the future to be accessible from school locations, therefore, a refresher training on climate resilient school safety will be developed recorded and rolled out via the HAMA e-learning platform.

**Sub-activity 1.3.2.1.c** *Inception workshop for entire BRACE project*

**Sub-activity 1.3.2.2.c** *Development and adjust training material for focal points based on School Safety Handbook for Tonga, ensuring coverage climate change risks*

**Sub-activity 1.3.2.3.c** *Training Workshops for 150 focal points in each of the 5 Regional Centres*

**Sub-activity 1.3.2.4.c** *Development, filming, and production of refresher training on school safety on HAMA e-learning platform*

**Sub-activity 1.3.2.5.c** *Role out and promotion of HAMA e-learning refresher training on school safety*

### **Activity 1.3.3 Implement school-level climate-related school safety plans**

During the training in activity 1.3.2, the 150 school facility focal points will develop School Safety and Resilience Plans and lead the implementation of these plans to strengthen school safety and educational continuity management.

**Sub-activity 1.3.3.1.c.** *Based on sub-activity 1.3.2.2.c facilitate the development of school safety and resilience plans*

**Sub-activity 1.3.3.2.c.** *Print and distribute the school safety and resilience plans.*

### **Activity 1.3.4 Provide climate resilience tools, equipment and kits to schools**

To support the implementation of School Safety and Resilience Plans the schools trained on climate-resilient school safety will receive toolkits, including flashlight, whistles, backpacks and vests.

**Sub-activity 1.3.4.1.c** *Compile and distribute climate resilience school safety toolkits.*

## **Output 1.4 (CSSF Pillar 3) Climate change resilience teaching and learning embedded in national systems**

This output will increase school children's understanding of Tonga's current climate change impacts and future risks and will build their awareness of climate-related career paths. An elective climate change subject for the final 2 years secondary school (Form 6/7) will be developed, building and working collaboratively with World Bank's TSRSP's curriculum revision. The elective climate change subject is expected to target gaps in the students' (form 6 and 7) knowledge and skills related to climate science, finance, and resilience and identify those who are interested to learn more about climate change. It is intended to cover key understandings of the causes, impacts, and responses to climate change, key concepts of climate change (e.g. adaptation, mitigation, loss and damage), and to encourage students to enter into adaptive livelihoods, the environmental sciences, and green jobs such

<sup>397</sup> Ministry of Education and Training, Save the Children and Global Partnership for Education. 2021. *Learning and Working Together for Resilience: School Safety Handbook for Tonga*.

<sup>398</sup> Pre-Post AHP Focal Point Training Survey

as renewable energy, environmental engineering, and climate-related research and other climate-related professions.

The curriculum will be linked to local and national industry demands informed by a rolling labour market research, and mapping of climate-resilient industries and livelihoods. This new elective subject in climate change will focus on climate change and DRR through engineering, economics, social science, and law while promoting gender equality, social inclusion, and disability awareness. The elective subject will build upon curriculum revision of secondary core subjects completed by the World Bank (for more information, see 1.5) and working collaboratively with the World Bank and other development partners focused on curriculum development in Tonga.

This output will also increase school children and youth understanding of climate change through improved access to climate-related education and information. The HAMA e-learning platform will be utilised to increase accessibility to school curricula which integrates climate change related topics and climate information for the general public, as well as (refresher) trainings (see activity 1.2.3, 1.3.2 and 1.3.5). Activities will include the promotion and further development of the HAMA e-learning platform as a multi-faceted climate change information and awareness building portal for various audiences including:

- Secondary school student e-learning portal: the focus will be on recording the final years climate change elective (activity 1.4.1 and 1.4.2) and recording of prioritised revised and new curriculum that integrates climate change (from the World Bank project) for secondary school students. This will include support to the media centre to produce the recordings.
- Teachers: teacher training modules providing teaching guidance on how to prepare for and teach in front of a camera for the recordings;
- Public awareness and usage of the HAMA e-learning platform will be promoted providing free access to all with clear secure sections of the portal for different audience user types (e.g. teachers).

#### **Activity 1.4.1 Develop teaching and learning materials on climate change ready to implement through national, non-formal, and informal curriculum**

In this activity, teaching and learning materials will be developed for an elective climate change subject for the final 2 of years secondary school (Form 6/7). To develop this elective climate change subject, an assessment on international and national existing efforts and best practices for elective climate change subjects will be conducted. It includes using expertise to undertake rolling research on current and future anticipated climate-related professions relevant to the Pacific market. This includes regular updates to capture new current and future trends ensuring that teaching and learning materials are relevant to new opportunities as they emerge. This market demand research will be shared on climate change forums for the general public's information as part of the resources on the HAMA e-learning platform, and within the elective climate change subject to inform learning components of the subject on climate-related careers and pathways. Collaboration with Tonga National University and other institutions for learning components and inputs will be an important element of the secondary student exposure to potential pathways.

The assessment and labour market research will inform the development of the elective climate change modules for integration into the secondary school curriculum. This will be a senior elective subject choice in association with MET and other development partners, ensuring all materials are sensitive to gender and people with disabilities. Building upon the primary and secondary curriculum revision undertaken by the World Bank, an elective climate change subject to target the final two years of secondary school will be designed collaboratively with inputs from MET, World Bank, and other partners. This elective subject design is intended to complement the integration of climate change in other subjects (undertaken by World Bank and other development partners). It simultaneously

explores the subject at a deeper level including content on green jobs, access to climate finance, and case studies on context-relevant engineering and climate change adaptation theories and models for SIDS. The curriculum will be linked to local and national industry demands, informed by rolling labour market research, and mapping of climate-resilient industries and livelihoods. Content for the elective and learning approaches will be based on consultation with and approved by MET and partners. Teacher training materials will be developed and piloted and rolled out in activity 1.4.2.

**Sub-activity 1.4.1.1.c** *Assessment of existing efforts and best practices to develop an elective climate change subject and integrate climate change into the curriculum*

**Sub-activity 1.4.1.2.c** *Undertake rolling labour market research to identify current and future climate-related demands to inform relevant curriculum development materials for the Pacific context*

**Sub-activity 1.4.1.3.c** *Develop elective climate change subject for final two years of secondary school.*

**Sub-activity 1.4.1.4.c** *Development of teacher training materials*

**Sub-activity 1.4.1.5.c** *Pilot testing of teacher training and refinement of materials*

#### **Activity 1.4.2 Build knowledge and capacity of teachers and education managers to implement climate change lessons inside the classroom**

Based on the development of the elective climate change subject in activity 1.4.1, the knowledge and capacity of teachers to implement this elective will be strengthened. The teacher training for the elective subject, developed in activity 1.4.1, will be rolled out. To ensure the elective is representing the latest trends and development in the labour market, the materials will be reviewed and materials will be updated accordingly in year four, leading to another rollout of teacher training.

**Sub-activity 1.4.2.1.c** *Rollout of teacher training on climate change subject*

**Sub-activity 1.4.2.2.c** *Review materials and implementation progress in year four*

**Sub-activity 1.4.2.3.c** *Update materials, if needed, based on review.*

#### **Activity 1.4.4 Disseminate climate change teaching and learning materials through Ministry of Education e-learning and other platforms**

In this activity, accessibility to education on climate change and climate-related topics (e.g. science) will be strengthened through the HAMA e-learning platform. It will facilitate the digitalisation in education as well as institutionalisation of climate-related education in Tonga. The climate elective (activity 1.4.1 and 1.4.2), (refresher) trainings on operation and maintenance (activity 1.2.3) and climate resilient school safety (activity 1.3.2) will be recorded on the HAMA e-learning platform. In this specific activity, the secondary national curriculum, revised by MET and TSRSP, will be reviewed to identify secondary topics on climate change or climate-related topics that can be recorded in HAMA e-learning platform. To facilitate the recording of these as well as the other HAMA e-learning platform trainings, targeted support (e.g. equipment) will be provided to the MET media centre in their filming and loading onto the HAMA e-learning platform. Additionally, teachers will receive guidance on preparing for and teaching in front of a camera. The activity will raise public awareness among teachers, parents, and students on the HAMA e-learning platform and climate change-related subjects and information through two promotional events.

**Sub-activity 1.4.4.1.c** *Review climate-related topics in secondary national curriculum and identify topics to be recorded in HAMA e-learning platform*

**Sub-activity 1.4.4.2.c** *Support the media centre and teachers to record climate change-related curriculum on HAMA e-learning platform*

**Sub-activity 1.4.4.3.c** *Production of any supporting materials to be used together with the HAMA e-learning courses*

**Sub-activity 1.4.4.4.c** *Promotional Events x 2*



## 4.5 Justification

The Government of Tonga does not currently have sufficient funding or capacity to meet the immediate adaptation needs of the education sector. Schools do not have the resources to self-support required adaptation actions. It is equally clear that current donor funding is not covering these needs to the level that is necessary to ensure the climate resilience of the education sector.

The project requests a GCF grant to finance the climate-driven intervention of the BRACE project based on the climate rationale. Tonga is a SIDS in alignment with GCF geographical priority areas, and has particular vulnerabilities to climate change. Tonga's contribution to global GHG emissions is negligible, yet Tonga is, "One of the most vulnerable countries in the world to climate change due to its geographic location, status as a SIDS and the importance of natural resources to its main economic sectors of fisheries."<sup>399</sup>

The risk of debt distress rating for Tonga is high.<sup>400</sup> Tonga's indebtedness had gradually declined from 2015 to 2019. Since 2020, however the economy has been hit by multiple shocks: cyclone Gita in 2015, the Covid-19 pandemic, cyclone Harold in 2020, and the Hunga Tonga-Hunga Ha'apai (HTHH) volcanic eruption and tsunami in 2022. The budget deficit is expected to rise sharply in the coming years due to a gradual decrease in grants under the current commitments and growing spending needs for the SDGs and climate resilience. Debt service payments are spiking in 2024 and the years following due to scheduled repayments to lending countries: 80% of Tonga's upcoming debt payments will flow to other countries as it owes the country more than USD 120 million (approximately a quarter of Tonga's GDP).<sup>401</sup> The bulk of this debt must be repaid by 2028. These current repayments will severely hamper Tonga's recovery and crowd out much-needed funds for climate change adaptation. For example, the HTHH volcanic eruption and tsunami alone led to damages equivalent to 36% of GDP.

The lack of global climate finance is a significant challenge for Tonga. It is apparent that SIDS' status as representing a special need for climate resilient development, "Does not translate into effective prioritization or allocation of funds".<sup>402</sup> Firstly, SIDS' public sectors inherently face major human and technical capacity constraints to design and implement climate projects. The complexity of the climate finance landscape and lack of harmonisation among the requirements of multilateral climate funds and donors further exacerbate this challenge. Secondly, the current climate and development finance systems fail to accommodate SIDS' unique needs, realities, and vulnerabilities resulting in fewer funding opportunities for SIDS. Data limitation for adaptation projects, high transaction costs, and small project sizes make it difficult for SIDS to attract investment and compete for access to climate finance.

While adaptation initiatives have been developed in Tonga, climate adaptation remains fundamentally underfunded. Even though the World Bank is currently implementing TSRSP reaching approximately 62 schools with infrastructural retrofits and replacements, this not enough to cover the needs of 36,008 school-aged children (4 to 18 years old). The private sector is underdeveloped and faces difficulties in Tonga, especially in reaching the outer islands that are most vulnerable to climate change and cannot be relied on to build adaptive capacity.

Combining the difficulty to access climate finance, the current financial situation of Tonga as well as the urgent need for strengthening climate resilience of Tonga's education sector, justifies the GCF funding request. Without such climate finance support, Tonga's Business As Usual (BAU) model

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<sup>399</sup> Government of Tonga (2020) Tonga's Second Nationally Determined Contribution. p. viii. Available [here](#)

<sup>400</sup>

<sup>401</sup> Indo-Pacific Development Centre: Lowy institute. Available [here](#)

<sup>402</sup> [Accessing Climate Finance Challenges SIDS Report 2022 \(un.org\)](#)

including affected school children and their futures and the education sector and systems will fall further and possibly more rapidly, into decline due to climate change vulnerability. There is very little opportunity to cope, let alone adapt, to projected climate change and extreme weather events.

## 4.6 Geographic & beneficiary selection

### 4.6.1 Site Selection

As agreed with government stakeholders, the selection of schools for output 1.2 (school facilities are safer and greener) is based on a World Bank's report<sup>403</sup> and dataset providing a baseline disaster risk analysis for schools, as a status and accessibility needs assessment. This assessment has been conducted by a consortium of international and local partners and led by the Italian company RED whose personnel has up to 20 years of experience in disaster risk modelling and management as well as coordinating large-scale international projects. The dataset includes 1034 school buildings in the provinces of Tongatapu, Vava'u, Ha'apai, and 'Eua (indicating schools in Niua's are excluded).

The main indicator of disaster risk for school is the Average Annual Loss Ratio (AALR) which refers to the average annual loss divided by the total replacement value. The dataset covers both climate-related disasters such as wind (indicating tropical cyclones and storm surges) and floods and non-climate related disasters such as earthquakes and volcanic eruptions. The BRACE project focuses on schools that are the most climate vulnerable and therefore calculated an AALR specifically for climate-related disasters such as wind and floodings. The BRACE design team excluded from the assessment the 62 schools where TSRSP is working or planning to work. Furthermore, consultations with MET, MEIDECC, and other key stakeholders pointed to the need to work in outer islands, and therefore schools at Tongatapu are excluded too.

Eligibility criteria for school selection includes:

#### 1. Climate vulnerability

Exposure to climate risks and underlying social vulnerabilities, including past climate impacts and socioeconomic conditions. Schools where the highest amount of learning loss due to school closures and/or absenteeism caused by climate-related impacts. Informed by the disaster risk analysis conducted by the World Bank<sup>404</sup> in Tonga.

#### 2. Infrastructure condition and location

Schools with unsafe, poorly maintained, or climate-exposed infrastructure, including buildings, roofs, WASH systems, and proximity to unsafe structures (e.g. water towers, large trees). Electrical connectivity and source of energy. Factor in topography and site-specific risks such as low-lying floodplains, swampy terrain, or coastal exposure. Retrofitting existing school facilities only will be eligible to be included, in line with SCA's GCF Environmental and Social Safeguards (ESS) Category C accreditation.

#### 3. Population and occupant capacity

Size of the community, student population, and occupant capacity of the premises. Priority given to schools with larger student populations. Considers average daily attendance and the school's suitability and capacity if used as a community shelter.

#### 4. Equity and inclusivity

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<sup>403</sup> Strengthening the resilience of public facilities in Samoa, Tonga, and Vanuatu: Final Report on the Assessment of Schools in Tonga. 2022.

<sup>404</sup> World Bank (2021). Strengthening the Resilience of Public Facilities in Samoa, Tonga, and Vanuatu: Final Report on Structural Typologies and Recommendations for Retrofit Options for Tonga. Available [here](#)



Schools that contain the highest proportions of students from vulnerable, disadvantaged or marginalised population groups (e.g., girls, children with disabilities, remote communities). Prioritise schools where interventions will reduce inequality and enhance inclusive access to safe, climate-resilient learning environments or emergency shelters.

### 5. Alignment with local policies plans

Consistency with national and local adaptation policies and strategies, education sector plans, or existing community disaster risk reduction frameworks. Preference given to schools designated as evacuation centres or those engaged in preparedness initiatives. Avoiding duplication by excluding schools that have already received significant climate-related infrastructure support (e.g. otherwise supported through emergency response or post-emergency recovery).

Based on these criteria, the BRACE design team came to the following tentative prioritisation of schools:

| # schools | Island  | School name       | School ownership | # School Buildings |
|-----------|---------|-------------------|------------------|--------------------|
| 1         | Vava'u  | Pangaimotu        | Govt             | 2                  |
| 2         | Vava'u  | Koloa             | Govt             | 1                  |
| 3         | Vava'u  | GMS Neiafu        | Govt             | 4                  |
| 4         | Ha'apai | Fakakai           | Govt             | 3                  |
| 5         | Vava'u  | Toula             | Govt             | 3                  |
| 6         | Ha'apai | Tongoleleka       | Govt             | 3                  |
| 7         | Ha'apai | Ofamo'oni College | Tokaikolo        | 5                  |
|           |         |                   | <b>TOTAL</b>     | 21                 |

#### 4.6.2 Beneficiary selection

For output 1.2, BRACE will target 7 schools in Ha'apai and Vava'u with improvements for resilience benefitting 1,000 enrolled children (574 female), 50 school staff, and 1,500 primary caregivers. An estimated total of 2,550 people including 1,349 women and girls, will directly benefit from studying, teaching, and spending time in these improved school facilities. In the previous section, it is explained how the schools were selected.

For output 1.3 on school safety and education continuity management, an estimated 12,021 children (5806 female) will directly benefit from being in schools that implement resilience plans, led by 150 school staff that receive training as climate-resilience focal points from 100 schools. This is an estimated total of 12,171 direct beneficiaries. This output intends to reach teachers in all regions of Tonga (Tongatapu, Ha'apai, Vava'u, 'Eua and the Nuia's) to ensure that schools all over Tonga will be able to benefit from capacity building and support for school safety and education continuity management.

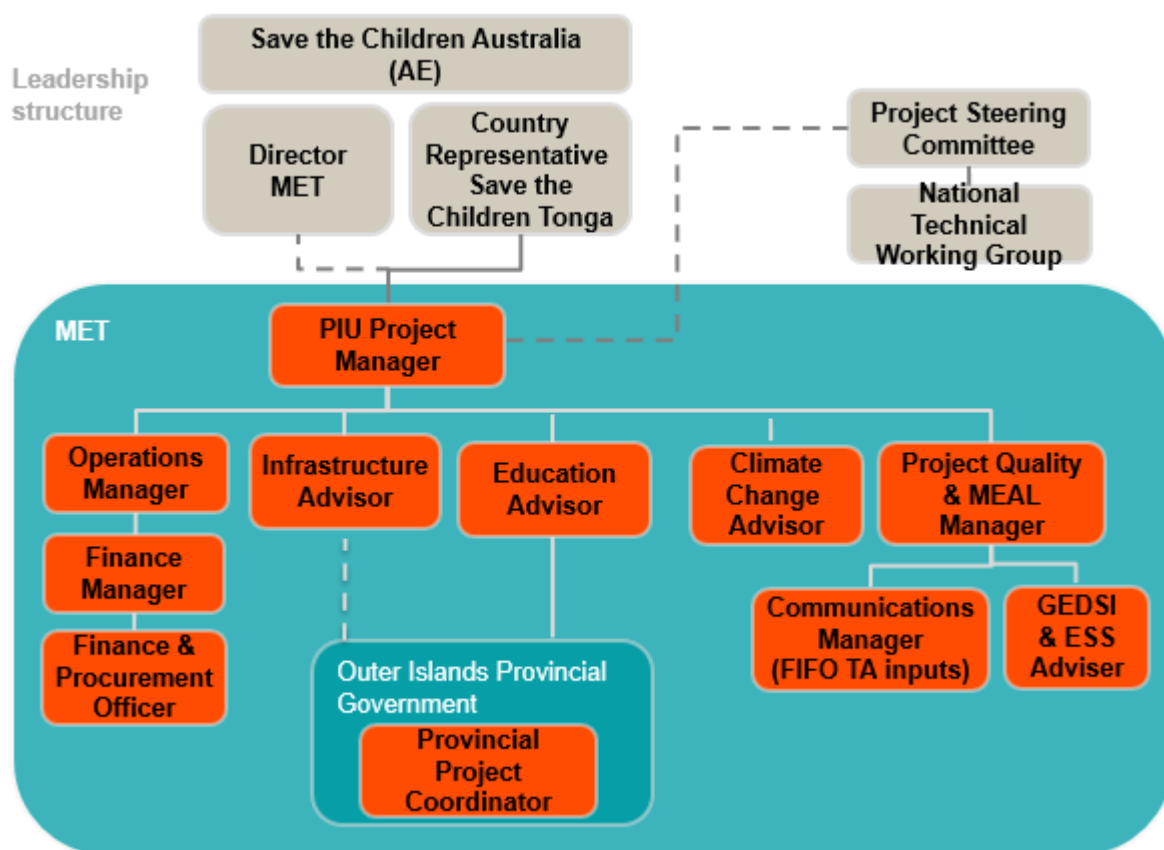
For output 1.4 on risk reduction and resilience education, 50 teachers from 50 schools will be trained to teach the upper secondary climate change elective, undertaken by an estimated 245 children (168 females). The MET will be involved in selecting teachers to ensure as many children as possible will be reached. For the HAMA e-learning platform, an expected 4,577 children (2,378 females) will engage with the e-learning module on climate-related subjects (including the climate change elective). This is an estimated total of 4,627 direct beneficiaries, including 2,403 women and girls (after adjustments to avoid double counting).

In total, under Component 1, BRACE will reach an estimated total of 13,671 direct beneficiaries including 6,631 women and girls. The total number of target schools without double counting is 100 schools. As highlighted above, not all the total direct targeted schools will benefit from all the outputs.

#### 4.7 Implementation arrangements and governance structure

The legal agreement between the GCF and Save the Children Australia (SCA) as Accredited Entity (AE) will be a grant agreement through a funded activity agreement. SCA, as the AE, will enter into legally binding Subsidiary Agreement with the Executing Entity Save the Children Tonga. The Government of Tonga, acting through MET will be an Implementing Partner. Whilst MET will act as the lead agency for the project, the MEIDECC will provide technical assistance as a key implementing agency.

The BRACE PIU will manage and oversee delivery of the agreed project activities. The PIU lead (Project Manager) will formally report to Save the Children Tonga as the designated Executing Entity (EE) in Tonga. The Project Manager will also have accountability to the Project Steering Committee (PSC), to ensure that all key decisions are in alignment with the strategic direction provided by the PSC. As Implementing Partner, MET will enter Memorandum of Understanding (MoUs) with other Government Ministries including the MEIDECC as well as with departments within the Ministry of Health (responsible for WASH) and Ministry of Internal Affairs (responsible for Women's Affairs). Formal project agreements with other Ministries will be managed through established government systems, as well as intergovernmental MoUs between MET and other government ministries and departments.



### Proposed Governance Structure of BRACE, Kingdom of Tonga

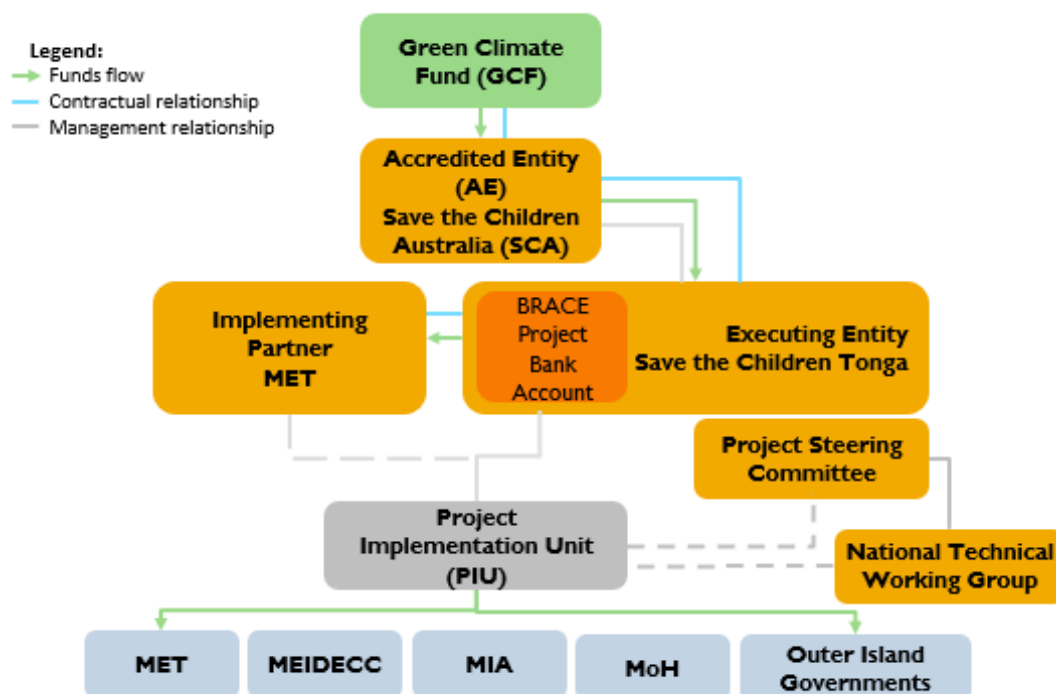
An overview of the governance structure of BRACE project in Tonga is as follows:

- SCA will provide project oversight as the AE
- The PIU will report to the EE Save the Children Tonga and will also have accountability to the PSC to ensure that all key decisions are in alignment with the strategic direction provided by the PSC.
- A PSC and National Technical Working Group will guide and advise on implementation. Membership will be agreed with Government and implementing ministries during inception but will include the EE, MET, and MEIDECC
- The PIU core team will be located embedded in MET as the lead agency
- The Operations Manager will lead finance, risk, HR, procurement and general administration
- A Provincial Project Coordinator will work closely with the outer island government representatives to coordinate activity implementation in outer island locations
- Proposed home for team roles:
  - MET staff (Orange)
  - Save the Children staff (Green)
  - Role to be shared with wider BRACE project (Yellow)

Project funds will be managed by the PIU established and managed by Save the Children Tonga. The PIU will also have accountability to the PSC to ensure that all key decisions are in alignment with the strategic direction provided by the PSC.

The PSC will be co-chaired by the Director MET and Director MEIDECC and including senior representation from implementing ministries.

Most project activities will be delivered through staff, consultant technical assistants, and advisers with PIU delivering some activities directly and working in collaboration with government departments on other activities. The project will support implementing partners to build the capacity required to effectively support local level adaptation actions and the PIU will deploy technical support across activities.



## BRACE Tonga project implementation arrangements

### Institutional and programme/project level grievance redress mechanism(s)

The BRACE Grievance Redress Mechanism (GRM) is included in the Annex 6 Environmental and Social Safeguards.

Any parties wishing to raise grievances caused by or associated with the project will be able to do so. In the first instance grievances will be managed by the BRACE PIU. The PIU will inform the communities about this GRM early in the stakeholder engagement process and in an understandable format and in the relevant language. This notification will include details of where and how to direct complaints.

The purpose of the GRM is to record and address any complaints that may arise during the implementation phase of the project and/or any future operational issues that have the potential to be designed out during implementation phase. It should address concerns and complaints promptly and transparently with no impacts (cost, discrimination) for any reports made by project affected people (AP). The GRM works within existing legal and cultural frameworks, providing an additional opportunity to resolve grievances at the local, project level.

The key objectives of the GRM are:

- Record, categorize and prioritize the grievances
- Provide a survivor centred approach to instances of SEAH
- Settle the grievances via consultation with all stakeholders (and inform those stakeholders of the solutions)
- Forward any unresolved cases to the relevant authority.

In addition to the project-based GRM, SCA will also maintain an email-based grievance mechanism, so that the public can also lodge grievances directly to SCA, should they wish to do so. Contact details for this GRM will be available to all project stakeholders and included on project websites and materials as appropriate.

The BRACE GRM does not prevent any affected person from accessing the GCF Independent Redress Mechanism.

Additional details on the GRM can be found in Annex 6 Environmental and Social Safeguards.

### **Capacity, experience and track record**

#### ***Accredited Entity: Save the Children Australia***

Save the Children is the world's leading independent organization for children, with 30 national organizations working together to deliver programmes in more than 120 countries. In 2019, Save the Children delivered programmes worth over USD 2.2 billion across 117 countries and directly reached over 38.7 million children. Our vision is a world in which every child attains the right to survival, protection, development and participation. Our mission is to inspire breakthroughs in the way the world treats children, and to achieve immediate and lasting change in their lives. Globally, Save the Children is implementing a portfolio of 100+ resilience-related projects and programmes valued at more than USD 200 million, including those with explicit objectives to achieve the following: reduce climate and disaster risks; increase adaptive capacity and speed recovery from shocks and stresses; seek the social and economic empowerment of women and youth; and amplify the voices of the most marginalized.

Save the Children Australia (SCA) was accredited to the GCF in November 2019 on behalf of the global Save the Children movement. SCA were chosen to lead on the GCF for Save the Children due to our longstanding leadership role in climate change and DRR. The Accreditation Master Agreement (AMA) was made effective in May 2020.

SCA has extensive experience of designing, delivering, evaluating, and documenting approaches to community-based adaptation in a wide range of countries, including in Solomon Islands, where we have worked for more than 30 years on a wide range of issues (including in education programming, community-based DRR and, in recent years, community-based adaptation). Our approach is to support governments to deliver their adaptation policy objectives and needs, while bringing a consultative approach to engaging a broad range of stakeholders in the design of climate change interventions.

SCA is currently implementing GCF-funded Pacific locally led climate projects in the Solomon Islands and Vanuatu including:

- ***Solomon Islands Knowledge-Action-Sustainability for Resilient Villages Project (SOLKAS)***: With an effective date of February 2024, this six-year project is in its first year. The project objective is to strengthen the resilience of target communities and beneficiaries to climate change impacts and associated natural hazards by strengthening the capacities of national, subnational, and local governments, communities, and schools to understand, adapt, plan and implement responses to climate crises. This will be achieved by providing tangible, community-led solutions to current and projected climate impacts. Project activities are structured into three components:
  1. Community-led development of adaptation plans, climate change knowledge and skills, and access to climate change information
  2. Resilient livelihoods, food and nutrition security, and school-level infrastructure
  3. Institutional strengthening.
- ***Vanuatu Community-based Climate Resilience Project (VCCRP)***: Commenced in 2022, this 6-year project aims to provide some of the most climate-vulnerable communities in 29 Area Councils of

Vanuatu with the knowledge, skills and support to adapt to the impacts of climate change. The project will partner with local government and communities to increase community access to climate information and early warning systems, support locally led adaptations to increase food security and build climate-resilient livelihoods; and build long-term adaptive capacity to pursue sustainable development pathways for a range of potential climate futures. The activities are delivered through three components:

1. Strengthening government, civil society and communities to support local resilience to climate change, including by providing access to climate information and early warning systems.
2. Implementing scalable, locally appropriate initiatives to meet community adaptation needs and create climate-resilient, sustainable development pathways.
3. Enhancing institutional adaptive capacity by building local governance systems and enhancing local-provincial-national linkages.

**Executing Entity: Save the Children Tonga**

Save the Children Australia will establish Save the Children Tonga as a legal entity in 2024. Overseen by Save the Children Australia, Save the Children Tonga will provide oversight and support to projects in Tonga ensuring operational and programmatic risk management.

**Implementing Partner: Ministry of Education and Training (MET)**

MET is the lead government agency for education and training, and as Implementing Partner will be responsible for the day-to-day execution and technical supervision of the project’s activities along with MEIDECC and the PIU.

MET is the largest Ministry in the country. According to the 2019/2020 Corporate Plan, the Minister provides overall leadership and direction for the Ministry, whilst the CEO oversees the day-to-day operations of the Ministry and implements the Ministry's policies and plans. The divisions of the Ministry address:

- **Leadership and policy advice and planning**
- **Quality assurance:** This division focuses on ensuring the quality of education through monitoring and evaluation.
- **Learning and teaching:** This division is responsible for curriculum development, teacher training, and other aspects of teaching and learning.
- **Post-secondary education:** This division oversees institutions like the Tonga Institute of Higher Education (TIHE).
- **Corporate services:** This division likely handles administrative functions like finance, human resources, and IT.

Recent projects in similar sectors and activities in which MET offered contributions include: World Bank’s Tonga Safe and Resilient School Project (TSRSP), TARP, GPE System Capacity Grant, Hunga Ha’apai Disaster and COVID 19 Recovery and Resilience Activation, PCASS, CSESI.

The World Bank and Save the Children have established PIUs in MET. The organisational model proposed for BRACE Tonga PIU is similar and more details are provided in above.

4.8 Risk factors and mitigation measures

| Selected Risk Factor 1 – Low Technical Capacity |             |
|---|-------------|
| Category  | Probability |

|  |                    |  |
|--|--------------------|--|
|  |                    |  |
| <b>Description</b>   |                    |  |
| Limited technical capacity among local stakeholders, including education authorities and school staff, could hinder the effective implementation and sustainability of climate adaptation measures in Tonga, potentially leading to suboptimal project outcomes.   |                    |  |
| <b>Mitigation measure(s)</b>   |                    |  |
| The BRACE initiative will implement a comprehensive capacity-building programme targeting school staff and school-aged children collaborating with government, local partners and other stakeholders across Tonga. This programme will focus on enhancing technical knowledge in climate-smart education systems, DRR, and child protection in schools, aligned with national frameworks and tools like Tonga's School Safety Handbook <sup>405</sup> . Regular monitoring and mentoring mechanisms will be put in place to ensure the application of learned skills and knowledge, with continuous technical support provided to local stakeholders to foster long-term capacity development.   |                    |  |
| <b>Selected Risk Factor 2 – Climate vulnerability</b>  |                    |  |
| <b>Category</b>  | <b>Probability</b> |  |
|  |                    |  |
| <b>Description</b>   |                    |  |
| High vulnerability to climate change impacts, such as extreme weather events and sea-level rise, could disrupt project activities and threaten the safety and livelihoods of targeted school staff, students, and communities in Tonga.  |                    |  |
| <b>Mitigation measure(s)</b>   |                    |  |
| BRACE will incorporate climate risk assessments into its planning and implementation phases to ensure that interventions are resilient to local climate conditions. In Tonga, for instance, the project will prioritize retrofitting school infrastructure to withstand extreme weather, including improving airflow, drainage, and accessibility. It will also support the accessibility of schools to school appropriate EWS and CIS. Infrastructure improvements, such as climate-resilient WASH facilities, will be prioritized to protect vulnerable schools. School safety and resilience plans will be developed and regularly updated, with ongoing collaboration with meteorological agencies and climate experts to provide data and insights that inform adaptive management.   |                    |  |
| <b>Selected Risk Factor 3 – Fraud and Corruption</b>   |                    |  |
| <b>Category</b>  | <b>Probability</b> |  |
|  |                    |  |
| <b>Description</b>   |                    |  |
| The risk of fraud and corruption in financial management and procurement processes could lead to the misallocation of funds, compromising the project's integrity and outcomes.  |                    |  |
| <b>Mitigation measure(s)</b>   |                    |  |
| Key mitigation measures will include strict adherence to anti-fraud and anti-corruption policies, compliance with national institutional structures, and the application of robust monitoring and reporting procedures. BRACE will enforce anti-fraud and anti-corruption policies through rigorous audits and transparent reporting mechanisms, with oversight provided by independent PIU teams. Digital tools will be employed to track expenditures and procurement processes, reducing opportunities for corruption. Furthermore, all project staff and partners will undergo mandatory training on ethical standards, anti-corruption practices, and the consequences of non-compliance. A whistleblower protection mechanism will be established to encourage the reporting of suspicious activities without fear of retaliation. Regular risk assessment will be conducted to identify and address any emerging vulnerabilities in |                    |  |

<sup>405</sup> Ministry of Education and Training, Save the Children and Global Partnership for Education. 2021. *Learning and Working Together for Resilience: School Safety Handbook for Tonga*.



|   |                    |  |
|---|--------------------|--|
| financial management. Specific procedures, such as the separation of duties between project management and executing entities, will be employed to maintain independent and effective financial oversight.  |                    |  |
| <b>Selected risk factor 4 – construction risk</b>   |                    |  |
| <b>Category</b>   | <b>Probability</b> |  |
|   |                    |  |
| <b>Description</b>  |                    |  |
| Lack of design input and requisite supervisory budget results in poor quality of design and poor workmanship.   |                    |  |
| <b>Mitigation measure(s)</b>  |                    |  |
| Supervision will be carried out by qualified Save the Children Structural Engineers/Construction Managers or a qualified third party. Technical consultations will include the Save the Children Regional Office Construction Advisor to ensure safe programming and appropriate project design. At least 10% of the budget is dedicated to supervision and covers construction costs, staff supervision, and fleet requirements. Safety and security assessments will be conducted with guidance from the infrastructure advisor and GEDSI specialist. The retrofitting design aims to enhance building resilience and will include planning that covers site surveys, water, and power supply assessments, site access conditions, hazard risk assessments, environmental impact considerations, building consent acquisition, and market surveys for material availability. Adequate time will be allocated for the recruitment and induction of technical staff, as well as for design/assessment, site selection (including Safety Audit and Accessibility Assessment), tendering, contractor assessment, construction implementation, approval processes, and accounting for potential seasonal interruptions due to weather. The proposed rehabilitation/retrofitting of school buildings will undergo structural engineering assessment by a qualified civil engineer and will incorporate design principles for vulnerable beneficiaries, integrated WASH, and inclusion measures. |                    |  |

## 4.9 GCF Investment Criteria

### 4.9.1 Impact potential

The project will contribute to GCF's overarching adaptation impact – increased climate-resilient sustainable development – by directly strengthening the climate resilience of 14,074 direct beneficiaries (of which 6,832 female) equivalent to 13% of the total population. Furthermore, the climate resilience of 21 schools will be strengthened to better cope with climate hazards such as sea level rise, droughts, floodings, extreme weather including tropical cyclones and heatwaves, and ongoing climate change.

The project will contribute to several of the GCF's fund-level adaptation and enabling environment outcomes including:

- ARA 1 (Most vulnerable people and communities) - Output 1.2 targets some of the most climate-vulnerable remote schools in Tonga with climate resilient school infrastructure retrofits and access to internet connectivity and renewable energy for EWS and CIS. Output 1.3 strengthens the school safety and climate resilience of targeted schools, ensuring students can safely enjoy an uninterrupted education. Output 1.4 ensures that Tongan students, who are all facing the impacts of climate change, can build their knowledge, skills and capacities.
- ARA 2 (Health, well-being, and food and water security) as Output 1.2 and output 1.3 increases access to and climate-resilience of school facilities and WASH facilities as well as strengthening school safety and educational continuity systems.
- ARA 3 (Infrastructure and built environment) as output 1.2 will increase the climate-resilience of school infrastructure and WASH-facilities.
- Core indicator 6 (Degree to which GCF investments contribute to technology deployment, dissemination, development, or transfer and innovation). The project will contribute to the Hama-eLearning platform and ensure an innovative way to disseminate information.

Furthermore, through the climate elective, students are prepared for new and innovative climate-related careers.

- Core indicator 7 (Degree to which GCF Investments contribute to market development/transformation at the sectoral, local, or national level). Through the climate elective, the project will support and prepare secondary level students for climate-related career options, contributing to a national pool of climate-related experts ready to strengthen Tonga's climate resilience.

#### 4.9.2 Paradigm shift

As described in the project description section and the overall ToC, building on the inextricable interconnected pillars of Comprehensive School Safety Framework (CSSF), the BRACE project will lead to a paradigm shift and transformative change that will lead to lasting impacts in Tonga. The outputs and activities of the project will contribute to significant results with regards to the safety of students due to improvements in school infrastructure, school safety, and educational continuity management systems. The BRACE project will also strengthen students' knowledge, skills and capacities on climate change preparing them for climate-related careers. It also contributes to the strengthening of the enabling environment and mitigation of key barriers such as gender and social inclusion, financial, technological, and institutional:

- **Gender and social inclusion:** Special attention will be paid to gender and social inclusion ensuring that youth, children, women, girls and people with disabilities will be represented in decision-making, that interventions will pay specific attention to their needs, and that their capacities will be strengthened in an appropriate way.
- **Financial:** The project will partially close the existing financial gap required to increase the climate resilience of the education sector. Additionally, it will build on initiatives, such as CSEI and PCASS to bring more climate finance to Tonga.
- **Institutional:** Support to school safety and educational continuity management systems will normalise and institutionalise these practices at school. Additionally, the project will build institutional capacity through tool development, coordination, and various trainings and refresher trainings that will be recorded for institutional memory.
- **Technological and informational:** Through offering internet connectivity, schools will be able to access EWS and CIS, and the HAMA e-learning platform, an innovative digital educational continuity mechanism. Additionally, through the development of a new climate change elective, students can build their technical and practical skills and knowledge on climate change, preparing them for climate-related jobs. Through the BRACE investments into school safety and educational continuity mechanisms students will be prepared for a climate-resilient future and climate-related career pathways.
- **Infrastructural:** Through physical retrofits of school facilities, including WASH, internet connectivity and PV systems, the climate resilience of school infrastructure is strengthened.

The BRACE project contributes to climate-resilient development pathways consistent with Tonga's development, climate change, and educational strategies and plans. The project's paradigm change will be underpinned by:

- Targeted school-aged children with significantly increased knowledge of current and projected climate change impacts and increased skills for climate-related professions/careers through climate change-related curriculum and climate elective.

- Targeted schools with safer and more climate-resilient school facilities supported by internet connectivity and renewable energy and enhanced access to climate information and early warnings.
- Targeted schools with strengthened climate and disaster preparedness and awareness and school safety and resilience plans.

### Scalability and replicability

This project has a high potential for both scalability and replicability, aligned with and designed to support achievement of the objectives of national policies. BRACE has high complementarity and coherence with other relevant climate-focused projects and has a high potential for scale up and replication both within Tonga and other contexts. The CSSF model could be scaled up in Tonga to ensure additional schools receive infrastructural improvements (output 1.2) and to ensure that school safety and educational continuity management systems (output 1.3) and the developed climate education curriculum (output 1.4) will support and reach more students.

### Knowledge sharing and learning agenda

Part of each project component will be dedicated to knowledge sharing and learning engagement between different stakeholders focused on school safety. Through annual lessons learned and reflection workshops, a learning agenda will be implemented and knowledge shared internally in Tonga and broadly through the recordings on HAMA e-learning platforms knowledge. Through PCASS and CSESI, lessons will be shared across the region. For other contexts, the project will showcase how climate action can be scaled up in the education sector by successfully applying the CSSF model in different contexts with diverse climate risks and vulnerabilities and in different educational systems. This will ensure that BRACE has a high potential for knowledge sharing and learning and the CSSF will simultaneously be rolled out in three completely different countries.

#### 4.9.3 Sustainable development

Although Tonga does not have its own dedicated SDGs, Tonga references the draft SDGs in the Tonga Strategic Development Framework 2015-2025 (TSDF). It concerns the draft SDGs because at the stage of development of the TSDF the SDGs were just drafted. The choice for national impact and national outcomes in the TSDF were informed by the draft SDGs as well as an international conference on SIDS.

BRACE in Tonga has a strong focus on Quality Education (SDG 4) and Gender Equality (SDG5) and Climate Action (SDG 13) through its focus on climate resilient education using a GEDSI-sensitive approach. Additionally, it also contributes to Good Health and Well-being (SDG 3) by ensuring the safety of students through safer school infrastructure and school safety systems.

Additionally, BRACE will have a range of economic, social, and gender co-benefits:

- **Co-benefit 1 - Gender and social inclusion:** girls and students with disabilities face additional barriers to education, and the continuity of school is extra important. Furthermore, in the climate change elective there is a focus on climate career pathways for all genders and women, and the success stories and leadership of girls and people with disabilities will be represented. Similarly, through climate resilient infrastructure, school safety, and educational management systems, fewer school days will be lost ensuring that children can still enjoy social contacts and networks and continue to build social skills.
- **Co-benefit 2 - Environmental:** Reduced emissions from greener school infrastructure paired with the use of PV panels for lighting and connectivity.

- **Co-benefit 3: Social** Increased Locally-led Adaptation (LLA) - Influencing the LLA agenda working at the local school level with children, resident teachers and parents/community members. LLA can be amplified through project deliverables such as the building and implementation of school safety plans, child clubs, NAP participation, finance roadmap development and collaboration/south-south learning. Such interventions lend themselves to LLA such as through devolved decision-making and inclusion of marginalised people. School community-led initiatives and engagement may amplify further through knowledge sharing as well as opportunities for advocacy at key events such as climate dialogues e.g. COPs, Community Based Adaptation events. Ground-up design and implementation of climate action is strongly aligned with the principles of Locally-led Adaptation which will empower children as key stakeholders in decision-making and taking climate action.

#### 4.9.4 Needs of recipient

Without intervention, the Tongan education system will suffer immensely from climate-related disasters, severely impacting children's education and therefore Tonga's future. Chapter 2 of this feasibility study showed that Tonga's school children, surrounding communities and the educational system is already - and will continue to – face, sea level rise, droughts, floodings, and extreme weather including tropical cyclones and heatwaves. Climate change generates intense challenges to Tonga's education system. Tonga does not have any climate change specific courses in schools and government stakeholders emphasized the need to guide and prepare students for climate professions.

A World Bank report<sup>406</sup>, confirmed by consultations with government stakeholders, indicated that schools on the outer islands especially are highly vulnerable to climate risks and urgently need infrastructural support. Past events, such as tropical cyclone Gita in 2018 and Harold in 2020, were highly disruptive of children's education and associated with high financial costs (see chapter 1). Although there are previous projects focused on school safety and continuity related to disasters (see 1.4), the climate lens has been missing. BRACE will respond to the urgent needs of Tonga as a country via strengthening the climate resilience of the educational system by building on the Comprehensive School Safety 3 pillars.

Unfortunately, domestic and international funding sources are insufficient to meet the adaptation needs of the education sector and the dispersed school system. Most international donor-supported programmes focus on immediate development priorities with only a minor focus on climate change (except for TSRSP). As climate risks increases, the viability of any investments in the education sector will be put at risk.

#### 4.9.5 Country ownership

BRACE strongly aligns and contributes to Tonga's national development, climate and educational policies, frameworks and governance and wider economic, gender and social frameworks and priorities. This includes Tonga's Climate Change Policy 2035, the Education Act, NDC and Third Communication, TSDF II, and JNAP II.

Country ownership has been ensured through extensive, comprehensive, and meaningful consultation with a diverse set of stakeholders, including:

- **Government:** following initial conversations around the project idea in June 2023 (including Honourable Prime Minister, Minister of Education, CEO MET, Deputy Director MET and Director of Climate Change) in June 2023 and initial project consultations in November 2023

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<sup>406</sup> Strengthening the resilience of public facilities in Samoa, Tonga, and Vanuatu: Final Report on the Assessment of Schools in Tonga. 2022.

with CEO MEIDECC, Director Climate Change and CEO MET, BRACE carried out a project design consultations in February-April 2024

- Tonga National University, USP Tonga Campus
- Other non-governmental parties, including DPO, Red Cross, Action Aid, Shift the Power Coalition, Tonga Women in ICT, Balance of Power, Tonga Leitis Association. BRACE sought the views, needs, and concerns about project design of these non-government parties that often represent vulnerable groups.
- Other projects, including TSRSP, OIREP, TREP, PCASS, TARP, Hunga Ha'apai Disaster and COVID19 Recovery and Resilience Activation
- School communities, including students, teachers and committee members.

The project will have a PIU based in government and will develop products (e.g. IEC materials, trainings, climate change elective curriculum, and recordings on HAMA eLearning platform) which will be owned by government. The project design and implementation will also build on and strengthen government-owned approaches and tools as well as other projects' good practices and lessons learned. For example,

- Output 1.2 will build on good practices and lessons learned from TSRSP, a project implemented by World Bank in close collaboration with MET and other government departments.
- Output 1.3 builds on School Safety Handbook<sup>407</sup> developed by the MET, Save the Children and GPE
- Output 1.4 will build on the current update of Tonga's curriculum of secondary school, led by MET in cooperation with TSRSP.

#### 4.9.5 Efficiency and effectiveness

The costs of implementation in Tonga are high, as implementing in Pacific SIDS entails higher costs than in many other developing countries. However, the Tongan Government will draw on past experiences in implementing projects and meeting best practices (including GCF requirements and GCF's shared learnings). It will also draw on efficiencies from the GPE and Save the Children International and available resources, and the AE's track record in delivering large scale GCF projects. This project specifically aims to strengthen the climate resilience of the most climate-vulnerable schools at outer islands in output 1.2. These schools are in remote and geographically challenging parts of the country, requiring significant logistical undertakings to bring human resources and materials to these places. These challenges are a key element of why these schools are highly vulnerable to the impacts of climate change and have limited opportunity to strengthen their adaptive capacities. Strengthening these infrastructures is at a high cost but will meet the immediate needs of these vulnerable schools, making the cost justifiable.

As output 1.3 and output 1.4 will be developed at national level, the costs for implementation will be more cost-effective. The implementation and rollout of Training of Trainings and Teacher Trainings will require some travel costs to ensure climate focal points and teachers can attend, however these activities are most cost-effective, as all the preparation and development of materials can be done in advance at national level. The same applies to the HAMA eLearning platform as recordings and rollout can take place from Tonga's capital Nuku'alofa.

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<sup>407</sup> Ministry of Education and Training, Save the Children and Global Partnership for Education. 2021. *Learning and Working Together for Resilience: School Safety Handbook for Tonga*.

#### 4.10 Sustainability and exit strategy

Sustainability is a key component in the BRACE Tonga design. A number of key sustainability strategies will be employed during project implementation to help ensure the project's benefits continue post-project and that the project's exit is successful. These strategies include:

- Building the evidence base for the successes of the CSSF to advocate for national government to allocate future climate finance and resources to support the climate resilience of the education sector using the CSSF model.
- Promoting long-term country and school ownership by engaging MET and MEIDECC government stakeholders in the development and roll-out of BRACE related outputs and activities, given they own the materials developed. This is facilitated through implementation arrangements in which the PIU sits within MET and MEIDECC. Previous experiences in developing and implementing climate resilience educational projects show that outcomes are more likely to be sustained and replicated if government and school stakeholders are engaged and in control of how outputs and activities are developed, implemented, and rolled out. This will also strengthen institutional ownership.
- Ensure financial sustainability of the project. The project will aim to maximise GCF financing to address inevitable operational and maintenance-related expenses by including training for school staff and school climate resilience focal points on installation, operation, maintenance, and repair of all equipment and budget to provide spare parts. This will further be supported by utilising sustainable technologies.

Sustainability of BRACE-specific outputs is also built into the project. Sustainability of:

- Output 1.2 will be facilitated through training on basic upkeep and maintenance of school infrastructure and WASH facilities as well as problem solving for internet connectivity common issues (as also described above)
- Output 1.3's school safety training will be realised by building on the already existing School Safety Handbook<sup>408</sup> while integrating a climate change component to this book in consultation with MET and MEIDECC
- Output 1.4's elective will be ensured through building on national curriculum revisions by MET and TSRSP and ensuring the institutionalisation of the new climate change elective through consultations with MET and MEIDECC as well as teacher trainings
- Output 1.2, output 1.3, and output 1.4 will be further ensured through the recording of refresher trainings on maintenance and upkeep of school facilities and school climate resilient focal point disaster preparedness training, as well as putting climate elective and climate-related education onto the HAMA-eLearning platform.

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<sup>408</sup> Ministry of Education and Training, Save the Children and Global Partnership for Education. 2021. *Learning and Working Together for Resilience: School Safety Handbook for Tonga*.

## 5. Component 2

Co-financing and parallel project finance for Component 2 of BRACE is provided by the Global Partnership for Education (GPE). The Climate Smart Education Systems Initiative (CSESI), funded by GPE and implemented by United Nations Educational, Scientific and Cultural Organization (UNESCO), UNESCO International Institute for Educational Planning (IIEP), and Save the Children provides technical assistance to lower income countries to reinforce ministry of education capacity for mainstreaming climate change into the education sector in 35 countries (supported by parallel project finance) – including Cambodia, South Sudan and Tonga (supported through co-financing). CSESI will therefore be a critical program supporting the replication and sustainability of the actions taken forward through BRACE to additional countries.

### 5.1 Barrier analysis

#### **Institutional Barriers**

##### ***Barrier 1: Ministries of education challenges in achieving foundational learning for all children in the context of climate change***

Analysis prepared by the GPE highlights that their partner countries are particularly vulnerable to climate change. Out of the top 60 countries ranked by UNICEF as having the highest children's climate risk in the world, 55 are GPE partners. At the same time, many education systems in GPE partner countries are not yet able to deliver both the foundational and advanced learning that will enable children and youth to thrive despite the rapidly changing environments and economies of the future. Children require 21st century skills such as the ability to think critically, communicate effectively, collaborate with diverse peers, solve complex problems, adopt a global mindset and engage with information and communications technologies. Teachers are often not prepared to teach about climate change and environmental subjects, and schools are often not well-equipped to prepare students to become empowered to both find and apply solutions and mobilize their communities for climate action. The foundations of a just transition to green livelihoods and lifestyles depend on the ability of education systems to provide relevant, quality, equitable learning opportunities to all children.

##### ***Barrier 2: Inadequate coordination between ministries of education and environment at all levels***

Globally, there is limited effective coordination between ministries of education and environment for differing reasons including insufficient budgeting, staffing, joint planning and target setting, data access and analysis, and limited technical expertise across departments/ministries. This results in the education sector not accessing climate data, limiting the quality of their planning and preparedness to climate shocks and stresses. Further, without adequate budget on climate change and education, schools and the wider education system are unable to adapt to increasing climate impacts.

The education sector is also not sufficiently included in UNFCCC processes, including National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs) development and implementation. This is largely due to the climate/environment sector not being aware of the impacts of climate change on education, the level of adaptation needed, and the role of education in increasing adaptive capacity and resilience. Similarly, education ministries find engagement in climate processes challenging due to time and budget constraints and lack of information and coordination from the ministries of environment. This is demonstrated by the fact only 11 of 53 NAPs consider education, despite the widespread need for the education system to adapt to climate impacts. NAPs and NDCs are important as they set the climate agenda for an entire country, including budgeting and



implementation. If education is missing and not included in the climate budget this constrains climate change and education action.

Likewise, climate change is not sufficiently included in education sector plans and policies. Analysis prepared by the GPE highlights that education systems are not prepared to deal with the increasingly extreme climate-related disasters. GPE analysis of 54 partner country education plans and policies shows that more than half recognize disaster risks in planning. However, 23 countries (43% of the sample) do not currently include analyses of disaster risks or strategies to address them in their sector plans and policies. This reflects global trends: according to a global survey covering 68 high disaster risk countries, nearly 60 percent of countries surveyed have either disaster risk reduction (DRR) or disaster response components in their education sector plan, but the detail tends to be limited.

### **Financial barriers**

#### ***Barrier 3: Inadequate access to climate change financing for the education sector***

CSESI is exploring with ministries of education how they are engaging in and accessing climate finance and the barriers they face in doing that. Of the scoping missions held with 20 countries (including Cambodia, South Sudan, and Tonga), climate finance – including understanding climate finance processes and funding opportunities - has consistently emerged as a priority for all ministries of education. Ministries of education in Cambodia, South Sudan, and Tonga (and beyond) report that they are not familiar with, nor accessing climate finance from, multilateral global climate funds including GCF, the Adaptation Fund (AF) and the Global Environment Facility (GEF), nor do they have existing relationships with Direct Access Entities (DAEs) to the GCF.

#### ***Barrier 4: Ministries of education lack sufficient finance to integrate climate change into the education sector***

Ministries of education in Component 1 of BRACE target countries (Cambodia, South Sudan and Tonga) lack sufficient finance to integrate climate change into the education system. In **Cambodia**, the proportion of education expenditure as a share of total government expenditure has steadily declined over the past four years and recurrent expenditure on education remains below the recommended level of 20%. In 2022, Cambodia's Mid-Term Review (MTR) of the Education Sector Plan (ESP) suggested that domestic financing pledges to the education sector would reach 20% in 2025. The MTR also rationalized that progress in attaining the 20% commitment had been delayed by the COVID-19 pandemic which reduced some aspects of The Ministry of Education, Youth and Sport (MoEYS) recurrent budget. This included a pay freeze for teachers and reduction in other spending areas due to: (i) higher costs in other ministries (such as health), and (ii) slightly reduced economic growth.

Another significant factor affecting all social spending was the requirement for additional funding being reserved for social protection measures. Nonetheless, the Prime Minister of Cambodia was a signatory to the Kenyatta Declaration issued at GPE's recent Global Education Summit, and the country submitted the Education Minister's commitment to ensure the 20% global benchmark was reached by 2025 (based on recurrent expenditures). For these reasons, together with the education stakeholders, the GPE Board decided that 40% of Cambodia Systems Transformation Grant is withheld to incentivize policy action for the Government to achieve two consecutive years of "year-on-year" proportional increases in school grants relative to non-wage expenditure and complete two core modules for a new Education Financial Management System. It is expected that these actions provide an evidence base for decision making and planning that could lead to incremental increases in domestic financing pledged to the national education budget, as well as more equity and efficiency in the domestic financing allocated to the sector.

**South Sudan**, compared to other countries with a similar context, dedicates a low share of its domestic resources to education. The Education Sector Plan proposed a review of legal provisions in the current Education Act. This included advocating the provision of domestic finance contributions to the education budget at an increase of 10% to 20%, thereby providing a legal basis to operationalize South Sudan's education financing vision. Nonetheless, it is important to recognize that South Sudan's budget allocation is currently low, with geographic disparities in access to education resources. The low budget allocated results in poor efficiency and execution. For example, as of March 2024, only around 20% of the education budget had been disbursed to the Ministry of General Education and Instruction (MoGEI). Teachers have not been paid and schools have not received capitation grants. Domestic financing (volume, equity, and efficiency) was assessed as high priority in the report by the GPE's Independent Technical Advisory Panel, as it could pose a significant barrier to the system transformation ambition of South Sudan's partnership compact. Despite the education budget increase over the past three fiscal years, the government's severe under-funding of its education system is inadequate to achieve universal quality primary education and to support system transformation. For this reason, together with the education stakeholders, GPE agreed to withhold a percentage of their systems transformation grant to incentivize policy action for the Government to build and approve a robust public financial management (PFM) framework, which is essential for effective allocation, utilization, and accountability of public resources.

In Tonga, climate-related challenges are increasing in scale, and mitigation measures are growing more costly as well. Funding those strategies remains difficult for a small nation of about 100,000. The Government of Tonga has made addressing climate change a chief priority over the next few years, and it is working closely with donor partners on a solid and effective response. In general, the government has been reliant on foreign funding and remittances (of a significant number of citizens who have left the country to work abroad), and this contributed to nearly 45% of the total national budget. Donors have been keen on supporting projects that help build institutional capacity and sustainability. In recent years, many donors have been supporting climate-related initiatives in addition to other related areas like infrastructure, etc. In education, the government has struggled with budgeting for the sector. Where it lacks in volume, Tonga's partnership compact lays out intentions to improve efficiency and effectiveness. In recent years, the country has been trying to find a good balance on spending, fixing the decrease in primary education and increase in secondary education to be able to meet the needs of the entire system.

#### ***Barrier 5: Lack of private sector engagement in the education sector***

There is limited data on private sector engagement in the education sector. In the Tongan education system, the majority of donors have been multilateral organizations and development banks. Moreover, while one of the mandates of the Tongan Chamber of Commerce (CoC) is to promote private sector engagement in development and in public-private partnerships, actual participation in the education sector has been limited, though the CoC has been active in efforts to reinforce local economic growth through businesses and trade. In terms of non-state actors in education, the strongest constituency has been churches and religiously affiliated organizations, who have not only been active in the local education group, but also manage the largest share of non-state schools in the country. While their financial support for the education sector may also be limited, the government does recognize these non-state actors as significant in enhancing the spiritual, social, cultural, political, and economic welfare of the country.

## 5.2 Project Description

**Outcome 2: Education ministries of the target countries have improved access to climate finance to increase the resilience of the education sector to climate change.**

**Output 2.1 Key stakeholders (in BRACE countries) have access to, and the ability to interpret and utilize relevant climate information as well as participate in decision-making and influence national adaptation planning processes including within the education sector.**

**Output description:** To harness the power of education and education systems to prepare children, youth and adults to develop the knowledge, skills and attitudes to counter the impacts of climate change, it is crucial that ministries of education and their partners understand how the risks resulting from climate change can impact the education sector, how these risks affect children's access to education differently and what action they can take to address and reduce these risks. With greater climate knowledge and understanding of climate risks, education systems can implement climate-informed policy, planning and budgeting. The suite of activities proposed through this component provide an opportunity for ministries of education to access technical support to enhance their capacities to integrate climate change into policies and plans. This includes accessing future climate finance that can ultimately allow education systems to anticipate and adapt to climate change therefore building a more resilient education system.

**Activity 2.1.1: Development of education sector risk analyses on the impact of climate change and climate risks on the education sector and children's learning.**

**Description:** Ministries of education in BRACE (Cambodia, South Sudan, and Tonga) countries will be supported to develop education sector risk analyses on the expected impact of climate change, on climate risks to the education sector, and on children's learning and how children can be affected differently.

Activities include:

1. Mapping and understanding the nature of climate risks to the education sector including through country-specific analysis of climate change impacts and overlaying these impacts on the education system, e.g., different climate change risk drivers on different areas of the country, over different periods of time.
2. Analyzing the impacts of these risks on the education system in terms of access, quality and education management, especially how these affect marginalized groups and different genders.
3. Examining the existing institutional, organizational, and individual capacities within the education sector for climate change action and identifying needs for additional capacities.

**Activity 2.1.2: Support ministries of education to coordinate with climate change ministries and engage in NAP processes, including those that may feed into global decisions such as those of the UNFCCC.**

**Description:** A holistic and cross-sectoral approach is essential to implement timely, flexible, and effective adaptation and environmentally sustainability measures and to maximize available resources. This activity will support MOEs in BRACE target countries to advocate and ensure education is reflected in climate change adaptation plans at national and subnational levels, including in National Adaptation Plans (NAPs), where possible. This activity will involve providing training and capacity building support for MOEs to understand adaptation related materials from the UNFCCC processes and how to engage

with ministries responsible for climate change. In addition, this activity will support a secondment of an education specialist to the NAP Global Network (GN) Secretariat, which is hosted by the International Institute for Sustainable Development (IISD). This secondment will support initiatives including: a thematic scan of NAPs for their inclusion of education, children, and youth; national action on education, children, and youth in the NAP process; and technical assistance as requested by countries through the NAP GN. Joint knowledge products and communications materials will also be produced with the NAP GN on the education, children and youth thematic review of NAPs. South-South peer learning and exchange will also be supported so that ministries of education, finance, and lead ministries for climate change adaptation (i.e., NAP focal point ministries) can share good practices and experiences (linked to Activity 3.2.3).

**Output 2.2 Key stakeholders (in BRACE countries) have increased access to, and the ability to utilise scaled up finance for climate action in the education sector to replicate and scale BRACE to a greater percentage of the country.**

**Output description:** Climate finance is increasing but MOEs cannot access their fair share alongside other national sectors and priorities such as agriculture, water, energy and transport. Whilst most countries are developing NDCs and to a lesser degree NAPs, and these policy and planning documents are helping inform national priority setting for accessing climate finance, the education sector is underrepresented. The suite of activities in output 2.2 are focused on enabling MOEs to understand and access climate finance so they can adapt to the impacts of climate change and contribute to building the resilience of children and communities through education and learning.

**Activity 2.2.1: Development of climate finance mobilization road maps.**

**Description:** Linked to the activities in 2.1, countries will be supported to develop climate finance resource mobilization roadmaps. Through a better understanding of the impacts of climate change on the education sector (activity 2.1.1); better understanding of climate finance mechanism; and a better understanding of the eligibility of education sector related activities under UNFCCC climate finance guidelines, ministries will be able to more efficiently and effectively access climate finance.

Activities will include:

1. Determining the accessibility of climate finance mechanisms.
2. Mapping of co-financing and partnership opportunities (public and private sector).
3. Determining education sector priorities for accessing specific climate finance mechanisms.
4. Development of guidance and tools to pursue climate finance opportunities.
5. Development of climate finance mobilization road maps.

**Activity 2.2.2: Direct Access Entity (DAE) support for working with the education sector on Green Climate Fund projects.**

**Description:** As the largest of the UNFCCC climate finance mechanisms the GCF plays a significant and growing role in distributing climate finance to LDC, SIDS, and Africa in the future. The GCF has been set up for and is intended to be accessed directly by states for investment in nationally agreed priorities. As the GCF is still relatively new, DAEs are also relatively new to working with GCF systems. Though DAEs vary significantly in size, mandate, structure, and capacity none to date have worked on education sector projects. This activity will target DAEs in countries where the education sector is included in the NDC or NAP to build their capacities and capabilities to support MOEs to access climate finance.

Activities will include:

1. Socialization of education sector plans for climate finance.
2. Awareness raising and training on the impact of climate change on the education sector and the education sector contributions to national climate resilience building, including differential impacts.
3. Development of education sector Simplified Approval Process (SAP) templates.
4. Development of tools and associated training for DAEs or emerging DAEs to work with MOEs to use templates to build complete SAP concept notes and access design funding.
5. Technical support to DAE and emerging DAEs to navigate tools and concept note development.

### 5.3 Implementation Arrangements

Component 2 will be implemented by Save the Children. It will also be complemented by parallel project finance from the GPE CSESI which is implemented by Save the Children Australia, UNESCO, and UNESCO IIEP. The CSESI implementation arrangements follow the GPE institutional arrangements. Both SCA and UNESCO are accredited to the GPE as ‘Grant Agents’ and are contracted through the GPE to deliver the technical assistance services outlined in the “Climate Smart Education Systems Strategic capability partnership framework”.

Governance of the project is managed through three layers:

1. A global coordination group serving as the project steering committee comprising of the GPE, SCA, and UNESCO leads.
2. A program coordination group serving as the technical working group
3. Country technical teams serving as the implementation groups.

| Global Coordination Group  | Programme Coordination Group   | Country Technical Teams  |
|--|--|--|
| <ul style="list-style-type: none"> <li>Organise global partnership arrangements ensuring alignment with co-leads; overseeing the programme implementation and communication efforts.</li> <li>Representative of the project, reporting to the GPE.</li> <li>Provide technical inputs and quality assurance for overall programme.</li> <li>Ensure clear and regular feedback mechanisms from countries are in place to inform the direction of the Initiative, ensuring safeguarding and accountability as implementation advances.</li> </ul> | <ul style="list-style-type: none"> <li>Undertake inception phase comprising a desk review, joint scoping mission and inception report.</li> <li>Develop country specific work programmes (including technical and costing details) in response to TORS.</li> <li>Lead programme implementation in accordance with country-specific work programs.</li> </ul> | <ul style="list-style-type: none"> <li>Input into the country costed technical work programmes.</li> <li>Implement programme in accordance with country-specific work programmes.</li> <li>Undertake programme monitoring and reporting on the indicators reflected in the country workplan results framework.</li> <li>In-country liaison with MoE and local education group and identify opportunities for communication.</li> </ul> |

|  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li>• Approve changes to the original budget, timeline and/or project design in consultation with ministries and Local Education Groups.</li> <li>• Communicate changes to the original budget, timeline and/or project design to GPE.</li> </ul> | <ul style="list-style-type: none"> <li>• Lead programme monitoring and reporting.</li> <li>• Development of project templates and resources.</li> <li>• Norm setting, and harmonization of approaches of the project cycle.</li> <li>• Ensuring continuity of technical approaches across country technical teams.</li> <li>• Technical backstop for Country Technical teams.</li> <li>• Quality assurance of technical work.</li> <li>• Monitor and support implementation of communication plan.</li> </ul> | <ul style="list-style-type: none"> <li>• Records and communicates program issues and risks.</li> </ul> |
|--|---|--|

The GCF resources for Component 2 are managed exclusively by SCA acting as EE for component 2.

#### 5.4 Justification for GCF Funding Request

As announced at COP28 with the GCF, the GPE CSESI project will invest USD 21 million to support 35 countries to integrate climate change into the education sector. This funding is essential to enable LDC resource-poor MOE to undertake necessary analysis of the impact of climate change on the education sector in order to plan on what they can and should be doing to protect education sector investment.

Whilst GPE funds, as co-financing for the BRACE countries and parallel project finance for the non-BRACE countries, will enable sector-based analysis and priorities planning, there is a gap in funds available for action at scale. With no financial return on investment private sector financing is lacking to date.

As highlighted in Barrier 4 above, MOEs in Component 1 of BRACE target countries (Cambodia, South Sudan and Tonga) and beyond in CSESI countries lack sufficient finance to integrate climate change into the education. In **Cambodia**, for example, the proportion of education expenditure as a share of total government expenditure has steadily declined over the past 4 years and recurrent expenditure on education remains below the recommended level of 20%. In **South Sudan**, budget allocation to education is currently low, with geographic disparities in access to education resources. The low budget allocated results in poor efficiency and execution. For example, as of March 2024, only around 20% of the education budget has been disbursed to the MoGEI. Teachers have not been paid and schools have not received capitation grants. Despite the education budget increase over the past three fiscal years, the government's severe under-funding of its education system is inadequate to achieve universal quality primary education and to support system transformation. In Tonga, in general, the

government has been reliant on foreign funding and remittances (of a significant number of citizens who have left the country to work abroad), and this contributed to nearly 45% of the total national budget.



## 6. Component 3

### 6.1 Stakeholder consultation

Save the Children Australia (SCA) undertook a series of stakeholder consultations with climate and education stakeholders and existing coordination groups to inform the design of Component 3 of BRACE.

Between April and May 2024, 24 consultations were held through Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) using a set of pre-defined questions outlined in Appendix 1. The following education and climate change focused networks were interviewed:

- Building Evidence Squared Climate Smart Education Systems Special Interest Group (SIG)
- Global Partnership for Education (GPE)
- Greening Education Partnership (GEP)
- Global Response to Education and Environment Network (GREEN)
- Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES)
- Global Campaign for Education (GCE)
- Global Education Cluster (GEC) including the anticipatory action and preparedness task team
- Geneva Global Hub for Education in Emergencies (EiE)
- Inter-Agency Network for Education in Emergencies (INEE)
- Schools2030 led by the Aga Khan Foundation (AKF).

KIIs were also conducted with:

- GPE
- Coalition for Foundational Learning
- Inter-American Development Bank (IADB)
- United Nations Children's Fund (UNICEF) and the United Kingdom Committee for UNICEF (UNICEF UK)
- Education Cannot Wait (ECW) and ECW's International Non-Governmental Organization (INGO) Climate Change Working Group chair from Right to Play
- International Rescue Committee (IRC)
- U.K. Foreign, Commonwealth and Development Office (FCDO)
- World Bank.

Climate change networks were also consulted, including:

- The National Adaptation Plan (NAP) Global Network (GN)
- The NDC Partnership
- The Alliance for Transformative Action on Climate and Health (ATACH).

A full list of those consulted is included in Appendix 2.

A face-to-face meeting was also held at COP28 on the 9<sup>th</sup> of December 2023 with participation from the Agence Francaise de Developpement, AKF, GPE, Save the Children, UNICEF, UNESCO, and the IADB. The purpose of the consultations was to understand the ability and suitability of existing mechanisms to support better sector-wide coordination so that countries, partners, and donors come together, learn from each other, and coordinate financing efforts at global and national level. A summary note capturing feedback from this meeting is included in Appendix 3.

## 6.2 Existing global coordination groups on climate change and education

This section highlights existing global coordination groups and networks identified in the education and climate sectors. It outlines the mandates and membership of each group, and any existing roles and responsibilities in relation to climate change and education.

### 6.2.1 Education coordination groups

The following education coordination groups listed below that were consulted as part of this feasibility study. They are the key global education groups BRACE is likely to engage with and there may also be others, such as Education International, Teachers for the Planet, Teach for All, and the International Education Funders Group (IEFG).

**Building Evidence in Education (BE<sup>2</sup>) Special Interest Group on Climate Smart Education Systems** aims to support research and knowledge exchange to accelerate the adaptation of education systems to climate change and increase the role that education plays in climate action. It has recently completed a research mapping and has a membership of around 15 organizations, primarily bilateral and multilateral donors.

**Global Education Cluster (GEC)** coordinates humanitarian response within the education sector and works in 30 countries with 50-100 partners in each country; 70% of them are local organizations. The GEC has a task team on preparedness and anticipatory action and is exploring how to further incorporate climate change into its work.

**The Geneva Global Hub for Education in Emergencies (EiE)** comprises 52 humanitarian and development organizations, governments, academia, the private sector, and other stakeholders to promote coordinated thinking and efforts in support of education in emergencies. In 2023, it strengthened its approach to climate change through launching a flagship report on climate change and EiE<sup>409</sup> and is involved in advocacy efforts on climate change, including climate finance in EiE.

**Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES)** strengthens global coordination of comprehensive school safety through its 20 members and 3 regional affiliates. It recently included climate change into its approach, has an advocacy working group and is advocating to ensure children's right to education is upheld, through access to learning in safe, resilient and green schools, with the capacity to prepare for and respond to different shocks and stresses. Its work is led by the Comprehensive School Safety Framework (CSSF).

**Global Campaign for Education (GCE)** is the world's largest social movement with over 120 national coalitions and international and regional organizations that advocate for quality public Education for All. The GCE has produced a policy paper exploring its role in climate change.

**Global Partnership for Education (GPE)** is a partnership of lower-income countries, donors, international organizations, civil society, including youth and teacher organizations, the private sector and private foundations. GPE supports inclusive education system reform efforts in low- and lower-middle-income countries, invests in climate-smart education strategies in its core grants, and funds global climate initiatives such as the Climate Smart Education System Initiative (CSESI) and BRACE.

**Greening Education Partnership (GEP)** is a network of networks with a governance structure and Secretariat supported by UNESCO and is focused on developing global guidance and targets on climate change within education. It has played a key role in galvanizing political momentum behind climate change among MOEs and education actors, with a focus on member states. With GPE and

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<sup>409</sup> Geneva Global Hub for EiE 2023. Leveraging Education in Emergencies for Climate Action. Available [here](#).

the UK Government, the GEP led the development of the Declaration on a Common Agenda for Education and Climate Change (“Declaration”)<sup>410</sup> launched at COP28.

**Global Response to Education and Environment Network (GREEN)** is a consortium of actors working at the intersection of education and climate change. It has a focus on implementation and bringing practitioners together to share research, evidence, and experience. GREEN holds bi-monthly meetings, organizes dedicated learning events and has a membership of more than 60 organizations.

**Inter-Agency Network for Education in Emergencies (INEE)** is a global network of more than 22,000 individual members affiliated with more than 4,000 organizations. It does not, currently, have a working group on climate change, but has incorporated climate change into its updated version of the INEE Minimum Standards.

**Monitoring and Evaluating Climate Communication and Education Project (MECCE)** is an ambitious international research partnership of over 100 leading scholars and agencies. Their goal is to advance global climate literacy and action through improving the quality and quantity of climate change education, training, and public awareness.

### 6.2.2 Climate networks

Work on climate change differs from the education sector as it works with and through many other sectors such as water, food, energy, health, transport etc. and therefore climate stakeholders are likely to focus on a specific area. As such, the networks that exist for education are different from those for climate change. Key networks that are relevant to BRACE include:

**NAP Global Network** connects over 2,000 participants from more than 155 countries working on national adaptation planning and action and has delivered direct support to more than 60 countries. The focus is on the NAP development and implementation process covering all sectors as requested by countries. The NAP Global Network provides technical support to countries in developing countries on their NAPs, peer-to-peer learning, and develops knowledge products. The Network participates in UNFCCC processes, especially those related to adaptation and climate finance, as well as gender equality and social inclusion. There is currently limited focus on the education sector.

**NDC Partnership** is a global coalition, bringing together more than 200 members, including more than 120 countries and nearly 100 institutions to deliver on ambitious climate action that helps achieve the Paris Agreement and drives sustainable development. While there is limited focus on education, there are resources on education in their knowledge portal under raising awareness and public education.

**Climate Action Network (CAN)** is the world’s largest climate network comprising more than 1,900 civil society organizations in over 130 countries. There is currently no working group on education.

**Education, Communication, and Outreach Stakeholder Community (ECOS)** is a community officially recognized by the UNFCCC Secretariat. ECOS is a “network of networks” that focuses on civic engagement, capacity building, policy development and climate literacy aligned with the Action for Climate Empowerment (ACE) agenda. ECOS aims to support the UNFCCC Secretariat and its ACE efforts and focal points, as well as other stakeholders. It is the only climate group recognized by the UNFCCC that includes education in its name.

**Children’s Environmental Rights Initiative (CERI)** is a global coalition advocating for children’s right to live in a clean, green, healthy, and sustainable world. CERI is conducted under the auspices of the UN Special Rapporteur on Human Rights and the Environment, in collaboration with core partners.

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<sup>410</sup> Available [here](#).

Education is included in the work of CERI, including as one of the commitments of the Declaration on Children, Youth and Climate Action (signed by 74 countries), though the focus is broader on all children's rights.

**Children in a Changing Climate coalition (CCC)** is a partnership of five leading child-centered development and humanitarian organizations and advocates and promotes the rights of children in climate change and DRR policy and practice. Education is clearly articulated in their Common Agenda.

As demonstrated by the list of networks, the education sector seems to be increasingly considering and addressing climate change, while the climate change sector has more to do to consider and recognize education.

## 6.3 Theory of change

### 6.3.1 The problem context

The theory of change starts with the challenge that climate change poses to the education sector and children's learning through increased temperatures, heat, and extreme and variable rainfall. This has implications for the education sector in a variety of ways due to the impact of associated climate hazards such as floods, droughts, and heatwaves. This includes, for example, damaging and destroying school infrastructure including access routes, teaching and learning materials and equipment, and negative impacts on WASH. As a result, schools can close or be used as temporary shelters by affected or displaced populations. This can have disproportionate impact on girls who can be at increased risk of child marriage or gender-based violence when families' livelihoods are threatened or when girls are among adults in temporary shelters. Even when schools are not closed, climate change affects learning outcomes through, for example, high levels of heat affecting concentration. Climate change can also increase or exacerbate compromised physical health and mental health challenges for children, caregivers, and teachers, especially for people with disabilities.

Despite the important role of education in climate action being recognized in Article 6 of the UNFCCC, in practice the sector has often been overlooked. UNFCCC processes can often focus disproportionately on climate education within the curriculum rather than on the sector's resilience and adaptation. The education sector has a powerful role in protecting the rights of children to safety, survival, development, and participation, despite the impacts of climate change. Education can provide children with the skills, knowledge and behaviours to adapt to climate change, reduce risks, partake in the greener economy and take on leadership roles in climate action. Taking an inclusive approach to education can also promote equality and climate justice.

### 6.3.2 Barrier analysis

The following barrier analysis was conducted based on consultation with stakeholders as part of this feasibility study. There are many barriers that prevent progress on climate change and education.

#### **Financial Barriers**

##### ***Barrier 1: Limited capacity and resources of multilateral climate funds (MCFs) on education resulting in the education sector receiving limited focus in global climate finance***

MCFs have limited guidance on education and climate change, and limited personnel/technical expertise to address this. This has resulted in education being severely underfunded by multilateral climate funds. According to recent research, while education interventions expected to reach or involve children are incorporated in 13% of MCF projects, only one project focuses on education as its

principal objective. MCF funded projects also lack a child lens with only 2.4% of projects categorized as child responsive<sup>411</sup>.

## **Governance and institutional barriers**

### ***Barrier 2: Limited education capacity in global technical climate support networks***

Currently, the NDC Partnership and NAP Global Network do not have a specific theme or personnel working on education. Education has not been a central sector with which the NAP Global Network has so far engaged, for various reasons including bandwidth constraints. The NDC Partnership has received 6,000 country requests. However, education is not currently a tag that it uses, but it does have raising awareness and public education as tags. This is illustrative of a lack of education prioritization at both national and global level. The lack of countries requesting support on education is likely due to a lack of education prioritization in NAPs and NDCs, and a lack of education being included meaningfully in global climate policies. However, it is also because MOEs are not aware of where to go to obtain support on including education in NDCs and NAPs.

The consultations also highlighted limited practical and user-friendly products on climate change and education; for example, how to include education within a NAP.

### ***Barrier 3: Education not sufficiently included in global climate policies***

Barriers 1 and 2 also impact the extent to which education is included in global UNFCCC policy processes. Education is currently limited to the Glasgow Work Programme on ACE<sup>412</sup> as one of six priorities. The need for resilience and adaptation of school systems and the wider education sector is not well reflected in ACE. Similarly, out of school children or those living in fragile, or refugee settings are not considered in policies on climate education/curriculum under ACE.

When looking at global adaptation policy processes, such as the new Global Goal on Adaptation now the UAE Climate Resilience Framework decided at COP28, education was not included as a priority thematic area. This is important as this global framework, goal, and its indicators have the potential to influence what governments include, prioritize, and fund in NAPs. If education is not included in its indicators during negotiations in 2024, it will also be difficult to measure the extent and effectiveness of adaptation in the education sector globally, further reducing its visibility.

While there has been an Education Thematic Day at COP for many years and significant momentum through the first Education Pavilion at COP28, the education sector has not yet succeeded in translating this momentum and ambition into inclusion in climate policy on NAPs, NDCs, the Global Stocktake, Loss and Damage, and Adaptation.

### ***Barrier 4: Education sector more broadly is not coordinating well with climate change stakeholders.***

The consultations confirmed that the global education sector is not coordinating strongly enough with climate change stakeholders. Not speaking the language used by the climate change community and not engaging sufficiently in climate change processes were identified as some reasons. Further, it was highlighted that the education sector has not yet made a strong enough case to the climate change sector that education is both a sector requiring adaptation and is a tool to address climate change. The consultations confirmed that the climate change sector is not adequately recognizing, including, and coordinating with the education sector. Likewise, the education sector is not coordinating strongly

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<sup>411</sup> Children's Environmental Rights Initiative 2023. Falling short: Addressing the climate finance gap for children. Available [here](#).

<sup>412</sup> ACE is a term adopted by the UNFCCC to denote work under Article 6 of the Convention and Article 12 of the Paris Agreement to empower all members of society to engage in climate action through climate change education, training, public awareness, public participation, public access to information and international cooperation

enough with the climate change community. The consultations also identified a lack of focus of coordination efforts within the education sector on climate finance specifically.

There is also a noted lack of coordination on climate advocacy, and the education community is not advocating with a coherent, joint voice to the climate change community; there are too many disparate voices. The [Declaration on the Common Agenda for Education and Climate Change](#) was highlighted as an example of the education sector coming together in a joint effort, but there was a lack of coordination with ministries of environment. A process to monitor the commitments and accountability were noted as challenges.

### **Informational barriers**

#### ***Barrier 5: Lack of space or mechanism for education partners to share and coordinate on climate change and education.***

As demonstrated above, there are several existing coordination groups on education that include climate change, but the consultations highlighted that these groups do not currently have a space to collaborate and align their activities. Furthermore, education donors with an interest in climate change do not have a space to share what they are working on or identify how to better align funding.

The current groups are siloed and are not always inclusive of local actors, children, and young people. The consultations raised that a major challenge and gap was ensuring that the wider community of education stakeholders at national level (including local education partners), civil society, children and young people can learn from, inform, and engage in the delivery of climate change and education programming. This includes localization opportunities.

#### ***Barrier 6: Limited ability to effectively communicate the needs of the education sector and benefits of climate-related education interventions.***

A compelling narrative and evidence of how education is negatively impacted by climate change and therefore requires adaptation *and* also how it positively advances climate action and adaptation is currently limited. Traditionally, research has largely been conducted by child rights or education organizations rather than the climate sector, as demonstrated for example by the limited focus on education in the Intergovernmental Panel on Climate Change (IPCC) reports. While the education sector has produced studies and resources on climate change and education, this is still not being communicated effectively to climate stakeholders and does not always speak the right language. Climate technical expertise, data, and science is still a gap for the education sector and is slowly being addressed. The consultations also highlighted that the education sector is still relatively new to climate change approaches. It has not sufficiently considered approaches and lessons from experience in comprehensive school safety and DRR which has been integrated in the education sector over many years.

This limited ability to effectively communicate the benefits of climate-related education interventions has knock-on impacts such as poor access to climate finance and limited meaningful inclusion of education in NAPs and NDCs.

#### ***Barrier 7: No clear knowledge management platform for climate change and education***

As highlighted above, there are many actors and networks working on climate change and education, but there is no clear knowledge management process or platform specifically for climate change *and* education. A number of knowledge management platforms were identified that focus on climate change or education including GPE's Knowledge and Innovation, Exchange (KIX) and WeADAPT. While

the GEP brings together over 800 stakeholders principally from the education sector, they do not have a knowledge management platform to share information.

The consultations noted that knowledge management systems for climate and education to share practice, experience, and documentation are lacking. Some networks and websites address this partially, but there is no singular 'go-to' knowledge management platform for guidance on climate and education finance, programming and policy, best practices, lessons learnt, case studies, and blogs etc. This means that actors seeking guidance and best practice examples must go through many different websites to find what they are looking for, if it exists. This can cause replication of resources and funding and means there is no clear oversight of what resources exist, and importantly what is missing.

Further, there is little bottom-up sharing of good practices despite a wealth of knowledge and implementation experience at local and national level. The consultations noted the lack of clear guidance, and bottom-up sharing of good practices and implementation experience in climate change and education.

### 6.3.3 Responses – the Theory of Change

The goal statement of component 3 is:

**IF:** Education and climate stakeholders globally are connecting, coordinating, collaborating, and cross-learning

**THEN:** there will be enhanced climate action in the education sector globally and nationally, and school communities and children will be more resilient to climate risks and hazards

**BECAUSE:** the barriers to scaled up climate action in the education sector will be substantially reduced.

**Component 3 Outcome:** Education and climate stakeholders globally are connecting, coordinating, collaborating, and cross-learning for enhanced climate action in the education sector.

The phasing of BRACE component 3 is important to build political momentum, as well as promoting a clear sustainability strategy that will ensure collaboration between education and climate actors moving forwards.

The project is expected to achieve co-benefits, namely:

Co-benefit 3: Influencing the Locally-led Adaptation agenda working at the local school level with children, resident teachers and parents/community members. LLA can be amplified through project deliverables such as the building and implementation of school safety plans, child clubs, NAP participation, finance roadmap development and collaboration/south-south learning. Such interventions lend themselves to LLA such as through devolved decision-making and inclusion of marginalised people. School community-led initiatives and engagement may amplify further through knowledge sharing as well as opportunities for advocacy at key events such as climate dialogues e.g. COPs, Community Based Adaptation events. Ground-up design and implementation of climate action is strongly aligned with the principles of Locally-led Adaptation which will empower children as key stakeholders in decision-making and taking climate action. This co-benefit is achieved through Outcomes 1, 2 and 3.



## 6.4 Project description

**Outcome:** Education and climate stakeholders globally are connecting, coordinating, collaborating and cross-learning for enhanced climate action in the education sector.

**Outcome description:** Under this output, BRACE, in partnership with education and climate stakeholders, will establish a BRACE climate and education coordination platform focused on financing. This platform will contribute to ensuring that climate action in education is strengthened through greater political recognition, enhanced coordination, and increased financing for the BRACE countries. The platform will be guided by a steering committee with a core team to drive forward specific agendas including the development of normative guidance on education for the climate change community, knowledge management, policy and strategic communications, and climate finance with a focus on Cambodia, South Sudan and Tonga.

**Output 3.1: Climate resilient education co-investment platform is established and effective in aligning strategic initiatives and financing.**

**Activity 3.1.1: Support a BRACE Climate and Education Financing Coordination Platform, including steering committee and core team.**

**Description:** BRACE will establish a climate and education coordination platform focused on financing to strengthen climate action in education through greater political recognition, enhanced coordination, and increased financing. The platform's focus will be to align and coordinate diverse investments in the climate/education nexus to maximize impact, leverage, and coherence and to bring education into climate change spaces. This platform will bring together global donors and implementers from climate change and education sectors to strengthen alignment across climate and education initiatives. A voluntary steering committee co-led by a high-profile climate actor/organization along with an education actor will be established to guide the activities and focus of the platform. The steering committee will be made up of key actors from the global climate change community, such as the GCF, Adaptation Fund (AF), Global Environmental Facility (GEF), and NAP Global Network; key implementers of the climate and education agenda such as GPE, Save the Children, UNESCO, UNICEF, AKF; bilateral donors such as FCDO, United States Agency for International Development (USAID), Australia, World Bank; and two child and youth representatives and two local civil society organization representatives from countries most at risk of climate change. In the first instance, the steering committee will be relatively small (under 12 members) to kickstart the collaboration. In time, as deemed appropriate by the steering committee, more members could be brought in. The steering committee will meet on a quarterly basis and together prepare an overall workplan to guide the activities outlined in this feasibility study as well as disseminate them through their own channels, including Activities 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.2.1, 3.2.2, 3.2.3, and 3.2.4.

In addition to the steering committee, a core team will be established to deliver on the climate finance, policy engagement, strategic communications, and knowledge management priorities outlined above and in Output 3.2. The initial structure would consist of three members sitting under the wider Project Implementation Unit (PIU):

- One BRACE manager – reporting to the steering committee and leading and coordinating the activities
- One coordinator to support the delivery of task specific activities
- Other positions including an education expert secondment into a key climate partner, such as the NAP Global Network, and a climate policy and strategic communications expert will be recruited as task-specific consultancy positions.

The core team will engage in other existing coordination groups outlined above including the BE<sup>2</sup> SIG, GEP, GADRRRES, and GREEN, offering technical input and support to better align activities across existing groups. Timebound working groups will be established, as required, to co-develop and deliver on specific objectives and activities. The working groups would be comprised of steering group members, or their proxies, existing coordination groups outlined above, or individuals or organizations with specific technical expertise and supported by core team members. For example, a dedicated group focused on climate finance who would guide the climate finance activities, including GCF education guide; the development of step-by-step guides on how to access climate finance and engagement in NAP in Cambodia, South Sudan and Tonga; and a group on policy and strategic communications that would focus on strengthening the role of education within UNFCCC policy processes.

### **Activity 3.1.2: Face-to-face meetings between ministries of education and environment for cross-learning and building political momentum**

**Description:** This would be an objective driven process to target and bring together different ministries – ministries of education, ministries of environment, and ministries of finance - across different regions in the three BRACE countries (Cambodia, South Sudan and Tonga) to drive implementation of the Declaration on the Common Agenda for Education and Climate Change at COP28.<sup>413</sup> This is a step-by-step process leveraging events towards COP30 and beyond. This activity would be guided by the BRACE coordination platform outlined in Activity 3.1.1.

The process will provide a ‘roadmap’ to **complement and contribute to implementing the COP28 Declaration** by securing further support and buy-in from other ministries needed for its success. The roadmap will be developed throughout the workshops to highlight key findings, actions and best practices/lessons learnt and shared widely at COP30. It will not be a ‘sign on document’ nor replace the existing Declaration. Instead, by engaging in the process, countries already demonstrate their commitment to the agenda and roadmap.

Objectives:

- Address the barriers highlighted above to improve coordination and shared understanding of the role education can play in addressing the climate crisis between education and climate/environment ministries and other stakeholders
- Education, finance, and environment ministries and stakeholders understand and recognize the importance of including education in climate action and adaptation and understand their options to strengthen the implementation of climate-smart education strategies
- Share lessons learnt and best practices, specifically on including education in NAPs, accessing climate finance for education, and implementing the CSSF. This is particularly from CSESI and BRACE countries going through the work planning and budgeting process
- Provide evidence-based examples, including how to consider gender and social inclusion.

Each workshop would be organized by the BRACE coordination platform Steering Group members (outlined in activity 3.1.1) plus national government representation.

Process:

- 1) Step 1, Year 1: Organize a series of workshops to develop a roadmap to implement the Declaration:

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<sup>413</sup> The Declaration draws from contributions made by member countries, stakeholders and partner countries of the Greening Education Partnership and has been endorsed or signed on to by 47 countries.

- a. **Workshop with climate and environment stakeholders.** Organize an **informal workshop at COP29** with climate and environment ministries stakeholders to understand why education is important to consider in climate action and how to include it.
  - b. **Workshop with finance stakeholders.** On the periphery of World Bank Spring Meetings, World Economic Forum or follow-up on Transforming Education Summit (TES) education finance champions, organize an informal workshop with finance stakeholders building on the previous workshop.
  - c. **Workshop with education stakeholders.** Organize an informal workshop at the **Education World Forum** to understand the barriers education ministries face in taking climate action and concrete steps to resolve this.
  - d. **Interministerial, intergenerational workshop at COP30.** This process would culminate in an interministerial, intergenerational workshop with ministries of environment, and ministries of education, held at **COP30** to collectively address the barriers. The workshop will focus on how to implement the Declaration, hearing from countries who have started implementation through CSEI and BRACE Components 1 and 2, and other countries to encourage cross-regional exchanges and learnings. Sessions would include policy processes (NAPs and global level policies), coordination and accessing climate finance.
- 2) Step 2, Year 2 onwards: Follow on activities including supporting the implementation of the roadmap.
- a. Brokering technical assistance from Component 2
  - b. Coordinating pipeline opportunities
  - c. Providing technical support through the NAP Global Network
  - d. Support country champions to advance this agenda through peer-to-peer learning and outreach
  - e. Further workshops at COPs and regional spaces to check-in on progress and share further learning.

These workshops would focus on identifying barriers ministries of education and environment face in climate change and education, discussing what can be done to address these, why this has not happened so far and what is needed to take action. There would not be a formal monitoring or reporting process.

The BRACE coordination platform Steering Group would also approach the UAE and Brazil COP Presidencies for political support to this process as a COP28 to COP30 trajectory and ensure continuity from the education momentum built at COP28 through the Declaration.

While the focus of this roadmap is implementation at national level, this may also support better inclusion and recognition of education in global policies such as on ACE, loss and damage, adaptation and the Global Stocktake.

### **Activity 3.1.3 Map and track global climate finance opportunities in the education sector**

**Description:** This activity would involve the mapping and tracking of global climate finance needs and opportunities from global climate funds (GCF, AF, GEF), as well as bilateral donors, the private sector, philanthropies, etc. The findings of the tracking would be produced into easy to understand and use guides with information by country that would be housed on the BRACE coordination platform knowledge management site outlined in activity 3.2.1 below for easy access in Tonga, Cambodia, and South Sudan. The findings of this analysis will be updated regularly and be accessible to ministries of education and other education and climate actors, such as donors and implementing partners.

Opportunities to track global climate finance for the education sector with other climate change partners, such as the NDC Partnership or NAP Global Network will also be explored. The tracking will also support on-going analysis of the extent to which climate finance is invested in climate change adaptation and mitigation strategies in and through the education sector. The mapping will support stronger coordination on climate-related investments in the education sector as the visual map will identify which partners are active in which countries, and where there are gaps in climate finance for the education sector. This activity will be delivered by the BRACE climate finance specialist and associated working group under the BRACE coordination platform outlined in Activity 3.1.1.

**Activity 3.1.4: Support adjustments to international climate finance reporting to reflect dual-benefit investments in climate and education**

**Description:** This activity will support the development of common methodologies to track the volume of education investments which include dual benefits for climate change adaptation and mitigation, with a view to influencing the OECD DAC climate finance tracking to better reflect the role of education in climate. It will also support monitoring of climate-related finance in the education sector, including developing guidance on how to code climate finance in the education sector and a standardized approach for monitoring, reporting, and accountability purposes. This can support Activity 3.2.4.

**Output 3.2: Key stakeholders are supported to engage in peer learning and exchange through south-south collaboration.**

**Activity 3.2.1: Develop and host information on the CSESI knowledge management platform on climate change and education for improved evidence and learning.**

**Description:** To strengthen knowledge management and access to evidence and guidance, the GPE parallel project financed CSESI project will build an education and climate change specific knowledge management platform while BRACE will support the development of information based on experience from the BRACE project in the three countries. This will enable cross country learning between BRACE countries and access to this information by the CSESI countries to further promote its utilisation in scaling up efforts on climate change and education. This will build on and support the BRACE coordination platform outlined in Output 3.1, Activity 3.1.1.

As highlighted in the barrier analysis, while knowledge management platforms exist on climate change and education independently, there are few that link the two. Given the aim of Outcome 3 is targeting climate change actors, there is credibility in more effectively and intentionally including education in an existing climate knowledge management platform. This will reach new stakeholders who may not be aware of existing education-led spaces.

The platform will provide materials and resources on climate change and education targeted at both sectors to ensure evidence-based approaches to implementation, funding proposals and policy influencing. The microsite would also host the global finance tracking guides outlined in activity 3.1.4, and the webinars and events outlined in activity 3.2.3.

Given the existing independent platforms on climate change and education, BRACE will also keep these updated by uploading key documents and resources, as well as events to those platforms. This is a similar approach to the core team in Output 3.1, (Activity 3.1.1) to ensure key links with existing networks and platforms.

This platform would work closely with and through climate knowledge networks to bring emerging evidence on education to the table and raise awareness, understanding, knowledge and engagement with climate decision-makers.

**Activity 3.2.2: Develop guidance on climate and education for the GCF, other global climate funds and the global education sector.**

**Description:** As interest builds in addressing climate change risks to the education sector, climate finance mechanisms will start to identify education projects that need support, similar to how education-focused donors have increasingly funded climate issues. For example, GPE published a framework for climate-smart education systems in 2023 and launched a pilot ‘climate-smart education systems initiative’ to support MOEs to build their capacity to address the risks of climate change to the education system. GADRRRES has launched an updated version of the CSSF, and the GEP has launched global guidance on greener schools and curriculum. Other actors, such as the Safe to Learn network, are also exploring approaches to climate-resilient education. GCF has not yet set a benchmark for engagement in the education sector, but in recent times has highlighted the importance of scaling up climate action in the sector. This education sector guide for GCF will be developed with input from other key actors and stakeholders and the steering committee outlined in activity 3.1.1 and draw upon the frameworks outlined above and experience from Cambodia, South Sudan and Tonga. It will include a menu of evidence-based programming options. In turn, this guidance may be adapted to inform the education sector approaches of other UNFCCC funds and those of other climate financiers. Once finalized, the education sector guidance for GCF would be launched to introduce the guidance to GCF donors and partners.

Additionally, BRACE, guided by the steering committee outlined in activity 3.1.1, will also produce a set of guidance documents for the global education sector and focused on the BRACE target countries. There are currently very few education projects funded by multilateral climate funds, despite a growing interest in climate change from the global education sector. BRACE will aim to address this through strengthening the capacity of education stakeholders – including civil society, donors, and other education partners - to access climate finance. It will develop step-by-step guides on how to access climate finance and engage in NAP and NDC processes for global education stakeholders, building on the work under Component 2 targeting MOEs. Three or four briefs in total will be developed – one customized brief for each multilateral climate funders (GCF), and one brief focused on NAPs.

**Activity 3.2.3: Organize webinars, thematic sessions and learning events on climate change and education.**

**Description:** To share learning and best practice amongst climate change and education stakeholders, BRACE will organize webinars, thematic sessions, and learning workshops to support learning across the target countries and sectors. These learning opportunities would be shared through the BRACE coordination platform knowledge management site established in Activity 3.2.1 and other identified networks. Up to 12 regional and thematic webinars and learning workshops will be conducted during the project implementation period.

**Activity 3.2.4: Develop and share strategic communications materials.**

**Description:** The aim of this activity is to raise the visibility and importance of education in climate spaces and influence climate policies and funding. Building on the workplan developed under the

BRACE Coordination Platform and core team under Activity 3.1.1, this activity would draw out the strategic communications and policy influencing activities in the workplan in more detail. This activity will align with and be co-financed by CSESI. By cascading information this can result in closing the current information gap and support sustainability of initiatives and cross-country learning.

Strategic communications opportunities would be identified through a communications plan and include:

- Social media outreach through key education and climate change networks, organizations and donors
- Op-eds and blog posts by prominent climate change and education actors in key media outlets and on climate change websites
- User-friendly case studies, lessons learned and research
- Videos demonstrating implementation of relevant guidance in schools (e.g. Standard Operating Procedures).

## Appendix 1: Component 1 - Climate and non-climate drivers, hazards, impacts and risks

| Country         | Climate driver and hazards  | Climate evidenced impacts   | Contributing non-climate drivers   | Climate risks   |
|-----------------|---|---|--|---|
| <b>Cambodia</b> | <b>Driver:</b> Increasing temperature<br><b>Hazards:</b> <ul style="list-style-type: none"> <li>• Drought</li> <li>• Increased evaporation rates</li> </ul> | Food insecurity related to child malnutrition; water scarcity impacts at school levels – increased dehydration, reduced hygiene, increased incidence of illness (e.g., diarrhea) <sup>414</sup> ; loss of concentration amongst schoolchildren <sup>415</sup> ; negative emotional and psychological impacts on children due to direct exposure to climate-related shocks <sup>416</sup> – psycho-social stresses from climate impacts on family/community/hunger reducing mental health and school performance; school absenteeism due to fetching household water needs, supporting parents in fields/business <sup>417</sup> ; inability of families to pay for secondary school fees due to loss of livelihoods, leading to increased drop-out rates; forced early marriage; protection issues and GBV increases related to attacks when fetching water/ escalating domestic violence due to climate impacts on land and water resources <sup>418</sup> ; degradation/decrease of natural resources on school site e.g. vegetation/trees, arable soils; school closures and/or disruptions <sup>419</sup> . | <ul style="list-style-type: none"> <li>• Poverty: household economic status, child-headed household, hunger</li> <li>• Poorest children and children from Indigenous and ethnic minority groups are the most likely to be out of school<sup>420</sup></li> <li>• Socio-cultural-economics: withdrawing girls and forced early marriage; withdrawing children to contribute labour to household economy/food growing</li> <li>• Geographical location: drought exposure levels higher in the north-west, moderate in the north-east and south-east</li> <li>• Geographical location: Last mile / remote communities often result in longer commutes to schools, fetching water, and working fields</li> <li>• Deforestation, especially linked to illegal logging may lead to change in microclimate and Tonlé Sap hydrology changes, reduced biodiversity and exacerbate the drying effect.</li> </ul> | <ul style="list-style-type: none"> <li>• Exacerbated current impacts based on increased magnitude and frequency of events</li> <li>• Likely increase of geographic exposure of events</li> <li>• Likely increase of vulnerable people – school level individuals (primary, secondary students, teachers)</li> <li>• Asset damage in the long term due to prolonged drought impacts on school infrastructure and natural resources</li> <li>• Likely increase of lost school days/days of concentration</li> <li>• Curriculum coverage reduced due to shorter school year</li> </ul> |

<sup>414</sup> Save the Children (2016). El Niño-Induced Drought in Cambodia: Rapid Assessment Report. Available [here](#)

<sup>415</sup> Save the Children (2016). El Niño-Induced Drought in Cambodia: Rapid Assessment Report. Available [here](#)

<sup>416</sup> Ministry of Environment and UNICEF (2024). Children's Climate Risk Index for Cambodia. Available [here](#)

<sup>417</sup> Save the Children (2016). El Niño-Induced Drought in Cambodia: Rapid Assessment Report. Available [here](#)

<sup>418</sup> Save the Children (2016). El Niño-Induced Drought in Cambodia: Rapid Assessment Report. Available [here](#)

<sup>419</sup> IBRD / The World Bank Group (2024). Choosing Our Future: Education for Climate Action. Available [here](#)

<sup>420</sup> World Vision (2019). Unlocking Cambodia's Future: Improving Access to Quality Basic Education. Available [here](#)



|  |  |   |   |   |
|--|--|---|---|---|
|  | <p><b>Driver:</b> Increasing temperature</p> <p><b>Hazards:</b></p> <ul style="list-style-type: none"> <li>• Heat stress/heat waves</li> <li>• Hotter days</li> <li>• Hotter nights</li> </ul> | <p>Child malnutrition due to heat-stressed food system; heat stroke; increased incidence of heat-related illnesses<sup>421</sup>, dehydration, and reduced ability to concentrate<sup>422</sup>, particularly in poorly ventilated or outdoor learning environments, sleep disruption, discomfort to body, reduced learning ability, cognitive function affected, underperformance in academic achievement; negative emotional and psychological impacts on children due to direct exposure to climate-related shocks<sup>423</sup> – psycho-social stresses from climate impacts on family/community/hunger reducing mental health; low levels of concentration by school teachers; absenteeism of both teachers and students<sup>424</sup>; national reduction in school hours or enforced school closures<sup>425</sup>.</p> | <ul style="list-style-type: none"> <li>• Poverty: household economic status, child-headed household, hunger</li> <li>• Poorest children and children from Indigenous and ethnic minority groups are the most likely to be out of school<sup>426</sup></li> <li>• Socio-cultural-economics: withdrawing girls and forced early marriage; withdrawing children to contribute labour to household economy/food growing</li> <li>• Geographical location: exposure levels higher in the central and northwestern regions</li> <li>• Deforestation, especially linked to illegal logging may result in: a) loss of biodiversity, b) microclimate changes and reduced shading at specific locations.</li> </ul> | <ul style="list-style-type: none"> <li>• Exacerbated current impacts based on increased magnitude and frequency of events</li> <li>• Likely increase of geographic exposure of events</li> <li>• Likely increase of vulnerable people - school level individuals (primary, secondary students, teachers)</li> <li>• Asset damage in the long term due to prolonged heat stress impacts on school infrastructure and natural resources</li> <li>• Demand for cooling system may compromise power systems.</li> <li>• Likely increase of lost school days/days of concentration</li> <li>• Curriculum coverage reduced due to shorter school year.</li> </ul> |
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<sup>421</sup> Save the Children (2016). El Niño-Induced Drought in Cambodia: Rapid Assessment Report. Available [here](#)

<sup>422</sup> Save the Children (2016). El Niño-Induced Drought in Cambodia: Rapid Assessment Report. Available [here](#)

<sup>423</sup> Ministry of Environment and UNICEF (2024). Children's Climate Risk Index for Cambodia. Available [here](#)

<sup>424</sup> Save the Children (2016). El Niño-Induced Drought in Cambodia: Rapid Assessment Report. Available [here](#)

<sup>425</sup> UNICEF (2025) Learning interrupted: Global snapshot of climate-related school disruptions in 2024. Available [here](#)

<sup>426</sup> World Vision (2019). Unlocking Cambodia's Future: Improving Access to Quality Basic Education. Available [here](#)

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|  | <b>Driver:</b> Erratic rainfall<br><b>Hazards:</b> <ul style="list-style-type: none"> <li>Rainfall patterns shift: wetter monsoons (Jul-Oct); drier planting months (Apr-May)</li> </ul> | Shifts in rainfall patterns fundamentally disturb growing cycles <sup>427</sup> resulting in food insecurity and child malnutrition, possible water security and water-borne diseases – all of which disrupts a child’s ability to learn and develop in a safe school setting.  | <ul style="list-style-type: none"> <li>Poverty: household economic status, child-headed household, hunger</li> <li>Poorest children and children from Indigenous and ethnic minority groups are the most likely to be out of school<sup>428</sup></li> <li>Socio-cultural-economics: withdrawing girls and forced early marriage; withdrawing children to contribute labour to household economy/food growing</li> <li>Geographical location: exposure levels for Jul-Oct across most of the country, particularly northeast.</li> <li>Deforestation, especially linked to illegal logging may result in: a) loss of biodiversity b) destabilised river banks, c) microclimate changes.</li> </ul> | <ul style="list-style-type: none"> <li>Exacerbated current impacts based on increased magnitude and frequency of events</li> <li>Possible continued shifting of rainfall ‘season’ undermining livelihoods linked to food production and general nutrition</li> <li>Likely increase of vulnerable people - school level individuals (primary, secondary students, teachers).</li> </ul> |
|  | <b>Driver:</b> Erratic rainfall<br><b>Hazards:</b> <ul style="list-style-type: none"> <li>Extreme rainfall events in 5-day and 1-month maximums</li> <li>Floods/flash floods</li> </ul>  | Food insecurity related to child malnutrition; reduced learning time in schools due to longer commuting times to school due to inaccessible roads <sup>429</sup> ; water- and vector-borne disease outbreaks <sup>430</sup> on schools and communities impacting child health and reducing learning time/levels of concentration; damage to school infrastructure and learning materials, damage to school data/records including teacher certificates; damage to telecommunications and essential services making at-home lessons challenging with | <ul style="list-style-type: none"> <li>Poverty: household economic status, child-headed household, hunger</li> <li>Poorest children and children from Indigenous and ethnic minority groups are the most likely to be out of school<sup>434</sup></li> <li>Socio-cultural-economics: withdrawing girls and forced early marriage; withdrawing children to contribute labour to household economy/food growing</li> <li>Geographical location: intense rainfall exposure levels higher in south-west and northeast</li> </ul>   | <ul style="list-style-type: none"> <li>Exacerbated current impacts based on increased magnitude and frequency of events</li> <li>Likely increase of geographic exposure of events</li> <li>Likely increase of vulnerable people - school level individuals (primary, secondary students, teachers)</li> </ul>  |

<sup>427</sup> The World Bank Group and Asian Development Bank (2021). Climate Risk Country Profile – Cambodia. Available [here](#)

<sup>428</sup> World Vision (2019). Unlocking Cambodia’s Future: Improving Access to Quality Basic Education. Available [here](#)

<sup>429</sup> World Bank (2023): Country Climate and Development and Report, Cambodia

<sup>430</sup> The World Bank Group and Asian Development Bank (2021). Climate Risk Country Profile – Cambodia. Available [here](#)

<sup>434</sup> World Vision (2019). Unlocking Cambodia’s Future: Improving Access to Quality Basic Education. Available [here](#)

|                    |   |  |  |   |
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|                    |   | <p>smart devices; education continuity disrupted and loss of school days when schools used as community emergency centres or children and teachers cannot access the school due to flood waters, or national enforcement of school closures<sup>431</sup> (approx. 1% of Cambodia's students could be disrupted each year by flooding, with up to 33% affected in some areas<sup>432</sup>); establishment of temporary schools not necessary fit for best outcomes in learning (e.g. location/conditions); psychosocial and mental health deterioration<sup>433</sup> due to stresses related to family/community situation and reduced performance at school; child injury or loss of life due to drownings.</p> | <ul style="list-style-type: none"> <li>• Geographical location: flood exposure levels higher in southern region and isolated parts of north-east</li> <li>• Deforestation may exacerbate the flooding effects and result in changes to Tonlé Sap hydrology.</li> </ul> | <ul style="list-style-type: none"> <li>• Asset damage from floods and flash floods likely to increase in the future due to magnitude and frequency of flooding.</li> <li>• Levels of inundations to force permanent school closures or relocations to high ground/less exposed areas.</li> <li>• Increased dependence on less equipped temporary schools</li> <li>• Likely increase of lost school days/days of concentration</li> <li>• Curriculum coverage reduced due to shorter school year.</li> <li>• Increased compromised essential services such as telecommunications and power systems.</li> </ul> |
| <b>South Sudan</b> | <p><b>Driver:</b> Increasing temperature</p> <p><b>Hazards:</b></p> <ul style="list-style-type: none"> <li>• Drought</li> </ul> | <p>Food insecurity related to child malnutrition<sup>435</sup>; water scarcity impacts at school levels – increased dehydration, reduced hygiene, possible outbreak of diseases (diarrhea), reduced school</p>   | <ul style="list-style-type: none"> <li>• Poverty: household economic status, child-headed households, limited financial resources within communities to enroll their children in school<sup>441</sup></li> </ul>   | <ul style="list-style-type: none"> <li>• Exacerbated current impacts based on increased magnitude and frequency of events</li> </ul>  |

<sup>431</sup> The World Bank Group (2023). Blog – Floods pose significant risk to education and healthcare in Cambodia. Available [here](#)

<sup>432</sup> The World Bank Group (2023). Country Climate and Development Report – Cambodia. Available [here](#)

<sup>433</sup> Ministry of Environment and UNICEF (2024). Children's Climate Risk Index for Cambodia. Available [here](#)

<sup>435</sup> Global Partnership for Education (2018). Prolonged Drought In East Africa Forces Millions of Children Out of School. Available [here](#)

<sup>441</sup> UN OCHA (2022). South Sudan Humanitarian Needs Overview. Available [here](#)

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|  | <ul style="list-style-type: none"> <li>Increased evaporation rates</li> </ul>  | attendance due to lack of water facilities on lengthy walks to school <sup>436</sup> ; school closures leading to learning losses <sup>437</sup> ; school absenteeism due to families having to travel in search of food, water, and fertile pastures for their livestock <sup>438</sup> ; protection issues and GBV increases related to attacks when fetching water <sup>439</sup> ; violence against women and girls (VAWG) due to increased food insecurity <sup>440</sup> ; degradation/decrease of natural resources on school site e.g. vegetation/trees, arable soils. | <ul style="list-style-type: none"> <li>Refugee and migrant child influx in northern states and associated educational needs</li> <li>Socio-cultural-economics: withdrawing children to contribute labour for the household economy; early marriage and sexual exploitation/GBV leads to loss of access to education for women and girls<sup>442</sup></li> <li>Socio-cultural: absenteeism of menstruating girls<sup>443</sup></li> <li>Socio-politics: withdrawing boys for child soldiers</li> <li>Socio-politics: Conflict affects attendance in schools and ability to concentrate<sup>444</sup></li> <li>Pastoralist children lack opportunities to attend school due to continual relocation<sup>445</sup></li> <li>Geographical location and topography (close to equator and low-lying)</li> </ul> | <ul style="list-style-type: none"> <li>Likely increase of geographic exposure of events</li> <li>Likely increase in vulnerable people – school-level individuals (primary, secondary students, teachers)</li> <li>Asset damage in the long term due to prolonged drought impacts on school infrastructure and natural resources</li> <li>Likely increase in lost school days</li> <li>Increased incidence of VAWG due to increasing food insecurity</li> </ul> |
|  | <b>Driver:</b> Increasing temperature<br><b>Hazards:</b> <ul style="list-style-type: none"> <li>Heat stress/heatwaves</li> <li>Hotter days</li> <li>Hotter nights</li> </ul> | Heat-related illness (including students collapsing <sup>446</sup> ); dehydration; indoor classroom environments unfit for learning and teaching due to negative impacts on teacher/student concentration and  | <ul style="list-style-type: none"> <li>Poverty: limited financial resources within communities to enroll their children in school<sup>450</sup></li> <li>Refugee and migrant child influx in northern states and associated educational needs</li> </ul>   | <ul style="list-style-type: none"> <li>Exacerbated current impacts based on increased magnitude and frequency of events</li> </ul>   |

<sup>436</sup> EiE Hub (2023). Leveraging Education in Emergencies for Climate Action. Available [here](#)

<sup>437</sup> IBRD / The World Bank (2024). Choosing Our Future: Education for Climate Action. Available [here](#)

<sup>438</sup> Global Partnership for Education (2018). Prolonged Drought In East Africa Forces Millions of Children Out of School. Available [here](#)

<sup>439</sup> UN Women (2024). South Sudan: Women Weathering Climate Impact and Increased Violence. Available [here](#)

<sup>440</sup> UN Women (2024). South Sudan: Women Weathering Climate Impact and Increased Violence. Available [here](#)

<sup>442</sup> UN OCHA (2022). South Sudan Humanitarian Needs Overview. Available [here](#)

<sup>443</sup> World Vision (2022). The impact of South Sudan's crises on education. Available [here](#)

<sup>444</sup> World Vision (2022). The impact of South Sudan's crises on education. Available [here](#)

<sup>445</sup> World Vision (2022). The impact of South Sudan's crises on education. Available [here](#)

<sup>446</sup> EU-Africa Chamber Group (2025). South Sudan: Heatwave forces schools to shut for second year running. Available [here](#)

<sup>450</sup> UN OCHA (2022). South Sudan Humanitarian Needs Overview. Available [here](#)

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|--|---|--|---|--|
|  |   | <p>motivation<sup>447</sup>; outdoor learning environments (e.g., in the shade of trees or in flimsy tents) expose teachers and students to harsh weather conditions, with disproportionate impacts on girls<sup>448</sup>; loss of educational gains due to school closures<sup>449</sup>.</p>  | <ul style="list-style-type: none"> <li>• Socio-cultural-economics: withdrawing children to contribute labour for the household economy; early marriage and sexual exploitation/GBV leads to loss of access to education for women and girls<sup>451</sup></li> <li>• Socio-cultural: absenteeism of menstruating girls<sup>452</sup></li> <li>• Socio-politics: withdrawing boys for child soldiers</li> <li>• Socio-politics: Conflict affects attendance in schools and ability to concentrate<sup>453</sup></li> <li>• Pastoralist children lack opportunities to attend school due to continual relocation<sup>454</sup></li> <li>• Geographical location: highest temperatures are concentrated in the northeast and southeastern regions</li> </ul> | <ul style="list-style-type: none"> <li>• Likely increase of geographic exposure of events</li> <li>• Likely increase in vulnerable people – school-level individuals (primary, secondary students, teachers)</li> <li>• Likely increase in lost school days / days of concentration</li> <li>• Curriculum coverage reduced due to shorter school year</li> <li>• Increased risk of early marriage, child labour and recruitment into armed groups</li> </ul> |
|  | <p><b>Driver:</b> Variable rainfall</p> <p><b>Hazards:</b></p> <ul style="list-style-type: none"> <li>• Extreme rainfall events in 5-day and 1-month maximums</li> <li>• Floods/flash floods</li> </ul> | <p>Damage to school infrastructure<sup>455</sup> leading to school closures (190 schools closed due to flooding in 2021<sup>456</sup>) and learning losses<sup>457</sup>; increased likelihood of school drop-outs – children out of school for a long time become less likely to return to school<sup>458</sup>; damage to transport infrastructure to schools (e.g., roads and</p> | <ul style="list-style-type: none"> <li>• Geographical location: intense rainfall exposure levels higher in Rumbek North, Akobo, and to a lesser extent Kapoeta.</li> <li>• Refugee and migrant child influx in northern states and associated educational needs</li> </ul>  | <ul style="list-style-type: none"> <li>• Exacerbated current impacts based on increased magnitude and frequency of events</li> <li>• Likely increase of geographic exposure of events</li> </ul>   |

<sup>447</sup> EiE Hub (2023). Leveraging Education in Emergencies for Climate Action. Available [here](#)

<sup>448</sup> EiE Hub (2023). Leveraging Education in Emergencies for Climate Action. Available [here](#)

<sup>449</sup> UNICEF (2024). Press Release – Rising Heat, Drought and Disease: Climate Crisis Poses Grave Risks to Children in Eastern and Southern Africa. Available [here](#)

<sup>451</sup> UN OCHA (2022). South Sudan Humanitarian Needs Overview. Available [here](#)

<sup>452</sup> World Vision (2022). The impact of South Sudan's crises on education. Available [here](#)

<sup>453</sup> World Vision (2022). The impact of South Sudan's crises on education. Available [here](#)

<sup>454</sup> World Vision (2022). The impact of South Sudan's crises on education. Available [here](#)

<sup>455</sup> UN OCHA (2023). South Sudan: On the front line of climate change. Available [here](#)

<sup>456</sup> World Vision (2022). The impact of South Sudan's crises on education. Available [here](#)

<sup>457</sup> IBRD / The World Bank (2024). Choosing Our Future: Education for Climate Action. Available [here](#)

<sup>458</sup> World Vision (2022). The impact of South Sudan's crises on education. Available [here](#)

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|              |  | bridges) <sup>459</sup> ; compromised access to education for schoolchildren due to use of schools as shelters for flood-displaced people <sup>460</sup> ; reduced school attendance due to dangers in commuting (e.g., mud and flooded roads) during the rainy season. <sup>461</sup>            | <ul style="list-style-type: none"> <li>• Poverty: limited financial resources within communities to enroll their children in school<sup>462</sup></li> <li>• Socio-cultural-economics: withdrawing children to contribute labour for the household economy; early marriage and sexual exploitation/GBV leads to loss of access to education for women and girls<sup>463</sup></li> <li>• Socio-cultural: absenteeism of menstruating girls<sup>464</sup></li> <li>• Socio-politics: withdrawing boys for child soldiers</li> <li>• Socio-politics: Conflict affects attendance in schools and ability to concentrate<sup>465</sup></li> <li>• Pastoralist children lack opportunities to attend school due to continual relocation<sup>466</sup></li> </ul> | <ul style="list-style-type: none"> <li>• Likely increase in vulnerable people – school-level individuals (primary, secondary students, teachers)</li> <li>• Asset damage in the long term due to flood impacts on school infrastructure and natural resources</li> <li>• Likely increase in lost school days</li> </ul> |
| <b>Tonga</b> | <b>Driver:</b> Increasing temperature<br><b>Hazard:</b> <ul style="list-style-type: none"> <li>• Drought</li> <li>• Increased evaporation rates</li> </ul> | Food insecurity related to child malnutrition; water scarcity impacts at school levels – reduced water availability for school gardens and hygiene facilities impacts on children’s nutrition and sanitation; <sup>467</sup> heat stress due to insufficient water for classroom cooling systems. | <ul style="list-style-type: none"> <li>• Geographical location: Ha’apai is likely to experience higher drought severity in the future</li> <li>• Reliance of schools on rainwater catchments for water supply increases vulnerability to drought<sup>468</sup></li> <li>• Poverty, especially for children in outer islands; Children and young people are</li> </ul>   | <ul style="list-style-type: none"> <li>• Exacerbated current impacts based on increased magnitude and frequency of events</li> <li>• Likely increase of geographic exposure of events</li> </ul>  |

<sup>459</sup> UN OCHA (2023). South Sudan: On the front line of climate change. Available [here](#)

<sup>460</sup> UN OCHA (2023). South Sudan: On the front line of climate change. Available [here](#)

<sup>461</sup> EIE Hub (2023). Leveraging Education in Emergencies for Climate Action. Available [here](#)

<sup>462</sup> UN OCHA (2022). South Sudan Humanitarian Needs Overview. Available [here](#)

<sup>463</sup> UN OCHA (2022). South Sudan Humanitarian Needs Overview. Available [here](#)

<sup>464</sup> World Vision (2022). The impact of South Sudan’s crises on education. Available [here](#)

<sup>465</sup> World Vision (2022). The impact of South Sudan’s crises on education. Available [here](#)

<sup>466</sup> World Vision (2022). The impact of South Sudan’s crises on education. Available [here](#)

<sup>467</sup> UNICEF (2017). Situation Analysis of Children in Tonga. Available [here](#)

<sup>468</sup> WHO (2016). Sanitation, Drinking-Water and Health in Pacific Island Countries: 2015 Update and Future Outlook. Available [here](#)

|  |   |   |  |  |
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|  |   |   | more likely to be living in poor households <sup>469</sup>   | <ul style="list-style-type: none"> <li>Likely increase of vulnerable people – school level individuals (primary, secondary students, teachers)</li> </ul>  |
|  | <b>Driver:</b> Increasing temperature<br><b>Hazard:</b> <ul style="list-style-type: none"> <li>Heat stress</li> <li>Hotter days</li> <li>Hotter nights</li> </ul> | Heat-related medical conditions, including heat exhaustion, particularly amongst children <sup>470</sup> ; failure to concentrate, including as a result of sleep disruption, negatively impacts on academic performance and risks learning outcomes; walking to school in heat also impacts learning potential; school closure or shorter school days leading to reduced teaching and learning time; dehydration; reduced physical activity tolerance; water- and vector-borne diseases (specifically dengue fever) <sup>471</sup> . | <ul style="list-style-type: none"> <li>Geographical: western regions are projected to experience the highest peak temperatures</li> <li>Poverty, especially for children in outer islands; Children and young people are more likely to be living in poor households<sup>472</sup></li> <li>Increased risk of school dropout for boys in secondary schools due to pressure to support family income</li> <li>Low literacy and numeracy levels, especially in rural areas where resources are limited</li> <li>Violence in school leads to children refusing to go to school, truancy, or children dropping out of school completely<sup>473</sup></li> </ul> | <ul style="list-style-type: none"> <li>Exacerbated current impacts based on increased magnitude and frequency of events</li> <li>Likely increase of geographic exposure of events</li> <li>Likely increase of vulnerable people - school level individuals (primary, secondary students, teachers)</li> <li>Loss of school days/days of concentration</li> </ul> |
|  | <b>Driver:</b> Erratic rainfall<br><b>Hazard:</b> <ul style="list-style-type: none"> <li>Floods</li> </ul>  | Impacts to transport infrastructure to school (roads, river crossing, walking tracks); increased risk of injury and death; health-related issues – spread of water- and vector-borne diseases, especially to ECE and primary; destruction of classrooms and WASH facilities impacts on  | <ul style="list-style-type: none"> <li>Poverty, especially for children in outer islands; Children and young people are more likely to be living in poor households<sup>475</sup></li> <li>Disability increases the risk of abuse against children, including child sexual abuse<sup>476</sup></li> </ul>  | <ul style="list-style-type: none"> <li>Exacerbated current impacts based on increased magnitude and frequency of events</li> </ul>   |

<sup>469</sup> UNICEF (2017). Situation Analysis of Children in Tonga. Available [here](#)

<sup>470</sup> The World Bank (2021). Climate Risk Country Profile – Tonga. Available [here](#)

<sup>471</sup> WHO (2016). Sanitation, Drinking-Water and Health in Pacific Island Countries: 2015 Update and Future Outlook. Available [here](#)

<sup>472</sup> UNICEF (2017). Situation Analysis of Children in Tonga. Available [here](#)

<sup>473</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

<sup>475</sup> UNICEF (2017). Situation Analysis of Children in Tonga. Available [here](#)

<sup>476</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)



|  |   |  |  |   |
|--|---|--|--|---|
|  |   | access to fresh water; increased prevalence of child sexual abuse and other forms of violence against children amongst those living in evacuation centres or camps in the aftermath of floods <sup>474</sup> .   | <ul style="list-style-type: none"> <li>Gender and sexual diversity: Increased risk of violence against children who identify as gender or sexually diverse<sup>477</sup></li> <li>Violence in school leads to children refusing to go to school, truancy, or children dropping out of school completely<sup>478</sup></li> </ul> | <ul style="list-style-type: none"> <li>Likely increase of geographic exposure of events</li> <li>Likely increase of vulnerable people - school level individuals (primary, secondary students, teachers)</li> <li>Asset damage from floods likely to increase in the future due to increased intensity of extreme rainfall</li> </ul> |
|  | <b>Driver:</b> Sea-level rise (SLR)<br><b>Hazards:</b> <ul style="list-style-type: none"> <li>Sea intrusion and saline inundation</li> <li>Coastal erosion</li> </ul> | Damage to school infrastructure; loss of land available for school infrastructure/ encroachment on existing education land especially in low lying areas near the capital Nukūlofa; land instability leading to increased risk of injury and death; psychosocial harm/mental distress; increased incidence of vector-borne diseases <sup>479</sup> . | <ul style="list-style-type: none"> <li>Poverty, especially for children in outer islands; Children and young people are more likely to be living in poor households<sup>480</sup></li> <li>Undersea volcanic activity</li> <li>Land subsidence</li> </ul>  | <ul style="list-style-type: none"> <li>Likely increase of geographic exposure of events</li> <li>Likely increase of vulnerable people - school level individuals (primary, secondary students, teachers)</li> </ul>   |
|  | <b>Driver:</b> Strong or severe winds<br><b>Hazard:</b> <ul style="list-style-type: none"> <li>Cyclones</li> </ul>  | Damage to school infrastructure resulting in school closures, which in turn negatively impacts on ability to learn (Tropical Cyclone Gita in 2018 damaged 72% of all schools on the main island of Tongatapu, severely impacting the education of approx. 23,000 students <sup>481</sup> ); impacts to   | <ul style="list-style-type: none"> <li>Poverty, especially for children in outer islands; Children and young people are more likely to be living in poor households<sup>486</sup></li> <li>Poor general maintenance and building conditions leading to unsafe school infrastructure (between 50 to 90% of</li> </ul>             | <ul style="list-style-type: none"> <li>Continuation of current impacts, which may be exacerbated by other climate and non-climate drivers</li> </ul>  |

<sup>474</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

<sup>477</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

<sup>478</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

<sup>479</sup> The World Bank (2021). Climate Risk Country Profile – Tonga. Available [here](#)

<sup>480</sup> UNICEF (2017). Situation Analysis of Children in Tonga. Available [here](#)

<sup>481</sup> World Bank (2022). Feature Story – Securing a Future with Safer Schools: Building Resilience in Pacific Schools. Available [here](#)

<sup>486</sup> UNICEF (2017). Situation Analysis of Children in Tonga. Available [here](#)

|  |  |  |   |  |
|--|--|--|---|--|
|  |  | <p>transport infrastructure to school (blocking roads, river crossing, walking tracks); flying debris during increasingly severe cyclones leading to increased risk of injury and death; psychosocial harm/mental distress; prolonged school closures lead to significant disruptions in learning; destruction of water and sanitation systems result in school closures, even if classrooms are undamaged<sup>482</sup>; damage to or destruction of school resources and furniture<sup>483</sup>; increased incidence of child neglect by parents and caregivers<sup>484</sup>; increased prevalence of child sexual abuse and other forms of violence against children amongst those living in evacuation centres or camps in the aftermath of a cyclone.<sup>485</sup></p> | <p>school buildings may not withstand a strong cyclone<sup>487</sup>)</p> <ul style="list-style-type: none"> <li>• Disability increases the risk of abuse against children, including child sexual abuse<sup>488</sup></li> <li>• Gender and sexual diversity: Increased risk of violence against children who identify as gender or sexually diverse<sup>489</sup></li> <li>• Violence in school leads to children refusing to go to school, truancy, or children dropping out of school completely<sup>490</sup></li> </ul> |  |
|--|--|--|---|--|

<sup>482</sup> Government of Tonga (2018). Post Disaster Rapid Assessment – Tropical Cyclone Gita. Available [here](#)

<sup>483</sup> Government of Tonga (2018). Post Disaster Rapid Assessment – Tropical Cyclone Gita. Available [here](#)

<sup>484</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

<sup>485</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

<sup>487</sup> IBRD / The World Bank (2024). Choosing Our Future: Education for Climate Action. Available [here](#)

<sup>488</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

<sup>489</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

<sup>490</sup> Save the Children (2023). Regional Child Protection Situational Analysis – Pacific. Available [here](#)

## Appendix 2: Component 3 - Guiding questions for interviews

### Questions for education focused networks

- What is the role of your organization or group in global coordination on climate change and education?
- How is your group working alone or together with others on the following:  
Advocacy and policy influencing for example, advocating for a greater focus on education climate change policy and financing.

Climate finance: Mobilizing resources for investments in climate change and education including from global climate funds, bilateral donors, and the private sector.

Research & evidence: Strengthening the evidence-base on what works in climate and education.

- What is your experience to date with current coordination efforts for climate change and education financing?
- How are you currently coordinating with others on climate and education?
- What's working well in the way your group is able to coordinate with others on these issues?
- What's not working as well as you'd like?
- Do you have any recommendations on what could be done better or differently to enhance or improve global coordination to strengthen the effectiveness of climate-related investments in the education sector?

### Questions for climate networks

- What is the role of your organization/group/network in global coordination on climate change? What types of activities are you involved in?
- Is education currently one of the topics you cover and if so, what does this involve?
- How is your group working alone or together with others on the following topics:  
Advocacy and policy influencing in climate change spaces, climate finance (mobilizing resources) and research and evidence on climate change.
- Could you highlight if your efforts in these areas currently include the education sector and if not, do you see any opportunities to include the education sector in future?
- Who are you coordinating with on climate and education, and how? What is working well and what do you think could be improved?
- What opportunities do you see for the education sector to get more involved in the work you are doing? What would be needed to make this happen?
- Do you have any recommendations for the BRACE design team on how to enhance global coordination on climate-related investments in the education sector?

### Key questions for the KIIs

- What global coordination groups on climate change and education do you participate in?
- What are your observations on how these groups engage in the following:  
Advocacy and policy influencing for example, advocating for a greater focus on education in climate change policy and financing.

Climate finance: Mobilizing resources for climate-related investments in climate change and in education including from global climate funds, bilateral donors, and the private sector.

Research & evidence: Strengthening the evidence-base on what works in terms of climate resilience and climate action in and through education.

- What is your experience to date with current coordination efforts related to climate change and education financing?
- What's working well in the way the groups you participate in coordinate with others on these issues? For example, climate change actors and actors from other sectors?
- What is not working so well? What are some of the gaps in coordination on the nexus of climate change and education coordination in your perspective – especially in relation to connecting education to financing for climate change adaptation, mitigation and biodiversity? climate finance?
- Do you have any recommendations on how to enhance global coordination to strengthen the effectiveness of climate-related investments in the education sector?

## Appendix 3: Component 3- List of individuals and organizations consulted

*\*Names in the below table have been redacted in accordance with the GCF Information Disclosure Policy, as this personal information is confidential under the disclosure policy of the Accredited Entity\**

| Name and organization                    | Network  |
|--|--|
| <b>Education networks</b>                |  |
| FCDO and GPE                             | Climate Smart Education Systems Special Interest Group       |
|  | Geneva Global Hub for Education in Emergencies               |
| UNESCO                                   | GADRRRES   |
|  | Global Campaign for Education (GCE)                          |
| GPE                                      | Coalition for Foundational Learning                          |
| Save the Children                        | Global Education Cluster (GEC)                               |
| Save the Children                        | GEC preparedness and anticipatory action                     |
| FHI 360                                  | Global Response to Education and Environment Network (GREEN) |
| UNESCO                                   | Greening Education Partnership                               |
|  | INEE   |
| Right to Play                            | INGO climate group chair                                     |
| Aga Khan Foundation                      | Schools2030  |
| <b>Climate change and other networks</b> |  |
| IISD                                     | NAP Global Network   |
|  | NDC Partnership  |
| WHO                                      | ATACH  |
| <b>Key informants</b>                    |  |
|  | GPE  |
|  | IDB  |
|  | UNICEF   |
|  | ECW  |
|  | IRC  |
|  | FCDO   |
|  | World Bank   |
|  | UNICEF UK  |

## Appendix 4: Component 3- Meeting notes from COP 28 climate and education meeting

On the 9<sup>th</sup> December 2023 in the margins of COP28, Save the Children, the Green Climate Fund and the Global Partnership for Education convened a climate finance roundtable focused on strengthening coordination of climate-related investments in the education sector. The aim of this meeting was to reflect on the potential to catalyze wider, more connected and effective investments to accelerate climate adaptation in education by better linking the education and climate agendas. With participation from the Agence Française de Développement, Aga Khan Foundation, UNICEF, UNESCO, and Interamerican Development Bank, the meeting surfaced a range of concrete opportunities to improve climate resilience in the sector.

During the dialogue, the *Building the Climate Resilience of Children and Communities through the Education Sector* (BRACE)<sup>[1]</sup> initiative was introduced. BRACE aims to rapidly accelerate climate change adaptation efforts in the education sector. The initiative – financed by GPE and GCF - will initially support the development and implementation of climate adaptation strategies in South Sudan, Tonga and Cambodia as pathfinding models for education-focused climate finance based on the Comprehensive School Safety Framework. Building on that experience, it will also support the development of a pipeline of ~20 investable climate and education projects that GCF, GPE, and other donors can consider for financing. To support this effort, BRACE proposes the establishment of a coordination mechanism, where countries, partners and donors can come together, learn from each other, coordinate efforts at global and national level, and improve the effectiveness of climate-related investments in the education sector to ensure children globally are resilient and protected.

### Key Takeaways from the Discussion:

The dialogue recognized the potential to build on current climate-resilient education coordination mechanisms including the Greening Education Partnership (GEP), and the Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES), and to explore lessons learned and experience from other coalitions such as the Foundational Learning Coalition.

Three main themes emerged from the discussion: **1) Evidence, 2) Coordination, and 3) Unlocking climate finance.**

#### **1) Evidence: Making a more rigorous case for education and climate investments**

- Participants recognized the importance of gathering strong evidence to demonstrate more clearly and effectively 1) the impacts of education on climate-related outcomes 2) effective climate and education investments.
- Multilateral development banks such as the IDB have developed methodologies to mainstream climate change into social sector investments, but there is significantly more room to learn from each other. UNESCO is developing climate change education curriculum guidance and norms which need to be benchmarked at country level and monitored for impact. The Building Evidence in Education (BE2) Special Interest Group on climate change, environment and education was noted for the mapping exercise it is currently undertaking to identify research activities and gaps in the sector.
- Based on a rigorous evidence stock take, gaps must then be addressed to inform a more compelling narrative of impacts capable of mobilizing political will and commitment to leverage education systems for a greener and more sustainable future.

#### **2) Coordination: Improving national and global coordination of climate-related investments**

- At the national level, ministries of education are often pulled in many directions and there is a proliferation of piecemeal initiatives and projects at country level that risk a lack of coherence and efficiency. At the same time, the climate finance agenda is highly complex, with a myriad of actors, alliances, funding sources and agendas that could be better integrated with the education sector's assets (infrastructure), resources (human and pedagogical) and processes (sector dialogue mechanisms and pooled funds).
- The Climate Smart Education Systems Initiative (CSESI), funded by GPE and implemented by UNESCO, UNESCO IIEP, and Save the Children has allocated \$16 million to provide technical assistance to lower income countries to reinforce ministry capacity for mainstreaming climate change into the education sector. By providing the scaffolding for a consultative process of country-driven needs identification and prioritization, this initiative will also serve as the impetus for the BRACE goal of supporting the climate-finance readiness of education ministries in an additional 20 countries over the next 5 years. The CSESI methodology can be documented and shared as a model to inform inclusive climate-focused education dialogue and program design processes in other countries, while also supporting learning between countries on their experiences.
- At the global level, the education sector can build on the already well-studied governance architecture to put in place a cooperative, transparent and mutually supportive coalition of actors to work in a more coordinated way. There was significant appetite from participants in the meeting to establish a formal but light coalition structure, supported by joint TORs, a workplan and small Secretariat.

### **3) Financing: Unlocking climate finance and leveraging co-investments**

- With climate impacts falling heavily on lower income countries and on the youngest age groups, there is strong appetite from climate funds such as the Green Climate Fund to grow a pipeline of education-focused investments, drawing on the proof of concept which BRACE aims to provide.
- At the same time, the education financing gap is significant and growing as climate disasters increasingly destroy infrastructure and materials, cause displacement and psycho-social vulnerability and thus weigh on scarce capital budgets of education ministries.
- By better linking education investments with climate adaptation co-financing, there is significant potential to increase resilience at the community level while protecting and advancing equitable, quality learning outcomes.
- A global coordination mechanism focused on climate and education could help to map opportunities and actors, support their collaboration on climate-related efforts in education, and grow the level of resourcing for climate resilience in and through education.
- Some examples of ways that this may be done include developing a menu of evidenced climate-resilience activities (covering all levels of education and all age groups) which are accompanied by their eligibility for various types of finance.
- The mechanism can also look at how to code climate finance in the education sector and have a standardized approach across partners and a common definition for monitoring, reporting and accountability purposes.
- It was also suggested to undertake a mapping of financing opportunities across countries, including where countries are eligible for GCF funds and the landscape of accredited entities able to sponsor education-focused programs. As an accredited entity, Save the Children also noted the potential for them to provide a helpdesk to support others to access GCF funds - alongside a menu of eligible activities/evidence to make the application processes easier for countries to navigate.

#### **Next steps:**

To move forward with the global climate-resilient education coordination mechanism, GPE, GCF and Save the Children will work together to do the following:



- 1) **In Phase 1** – Save the Children, GPE and GCF will conduct a review of existing coordination mechanisms, including those in the education sector and beyond. In May and June 2024, host consultation meetings in Paris and Washington to explore how best to establish a coordination mechanism, including potentially funding of key positions to lead the mechanism.
- 2) **In Phase 2** – explore other partners who could be brought in to the governance of the coordination mechanism.

*\*This portion has been redacted in accordance with the GCF Information Disclosure Policy, as the portion is confidential under the disclosure policy of the Accredited Entity\**

[<sup>\[1\]</sup> The Green Climate Fund, the Global Partnership for Education and Save the Children launch the world's largest investment for green schools at COP28 | Green Climate Fund](#)