Climate Resilient WASH and Disaster Management services for vulnerable children in the Central African Republic (CRDM-CAR)

Methodology for Estimating Beneficiaries

This document has been prepared for The United Nations International Children's Fund (UNICEF), as part of work to prepare the GCF Funding Proposal Climate Resilient WASH and Disaster Management services for vulnerable children in the Central African Republic (CRDM-CAR).

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ABBREVIATIONS

ARA	**Adaptation Result Area**
CAR	Central African Republic
DRR	Disaster Risk Reduction
EWS	Early Warning Systems
GCF	Green Climate Fund
MEL	Monitoring, Evaluation, and Learning
ODF	Open Defecation Free
WASH	Water, Sanitation, and Hygiene
WRM	Water Resources Management

1. INTRODUCTION

The population of the Central African Republic (CAR) face severe negative impacts on their health and development outcomes due to climate change's detrimental effect on Water, Sanitation, and Hygiene (WASH) services. These populations experience heightened water scarcity and disease outbreaks driven by increases in the intensity and frequency of extreme rainfall, flooding events, and rising temperatures. Extreme weather events, which have increased in frequency by up to 40% in some prefectures since 2005, destroy critical infrastructure and contaminate water sources, trapping communities in a cycle of poverty and poor health.

Vulnerable populations in CAR are exposed to the effects of climate change due to several interconnected challenges: heavy dependence on rain-fed water sources with limited climate-resilient infrastructure, inadequate sanitation facilities and widespread open defecation that exacerbates contamination during floods, destruction of existing WASH infrastructure like wells and latrines, and underdeveloped early warning systems for floods and droughts. Women and girls face a particularly heavy burden, as climate-driven water insecurity forces them to travel greater distances to collect water, which increases their risk of gender-based violence while negatively impacting school attendance and economic stability. Without addressing these barriers, WASH services will continue to degrade, increasing the burden of water- and vector-borne diseases and threatening the health and development of the CAR's most vulnerable people.

The proposed project aims to improve the climate resilience of WASH services and vulnerable communities in four target prefectures: Bangui, Bamingui-Bangoran, Ouham, and Vakaga. It will achieve this by strengthening technical and institutional capacities to conduct climate risk assessments, designing and implementing climate-resilient WASH infrastructure, enhancing water resource management, and improving disaster risk reduction and early warning systems.

The project's Theory of Change states that: IF technical and institutional capacities are strengthened to conduct climate risk assessments, design and implement climate-resilient WASH infrastructure, enhance water resource and disaster risk management, and improve early warning systems; THEN the climate resilience of WASH services and vulnerable communities in CAR will be significantly improved; BECAUSE climate-adaptive policies and governance will be mainstreamed across sectors, community engagement in local climate action will be enhanced, infrastructure vulnerability will be reduced, and water security will be strengthened at national and subnational levels.

The project is structured around two complementary components that create an integrated framework for building climate resilience in the CAR's WASH sector. This structure addresses systemic vulnerabilities by simultaneously improving the national enabling environment while delivering tangible, climate-resilient WASH services to communities on the ground.

Component 1: National policies/plans, systems and institutional capacities and information systems (Enabling environment)

This component focuses on strengthening the enabling environment for climate-resilient WASH services in the CAR. This will be achieved through **Outcome 1**: Strengthened national policies, systems, and institutional capacity for climate-resilient WASH (CR-WASH) services, water resources management (WRM), and climate disaster risk reduction (DRR).

The specific outputs for this outcome are:

- **Output 1.1**: Climate change adaptation is integrated into national policies and regulations, and funding for adaptation is mobilized.

- **Output 1.2**: Evidence based WASH, WRM, DRR, and EWS are informed by improved planning, MEL (monitoring, evaluation, and learning) framework, and data integration.
- **Output 1.3**: Institutional capacity and governance for CR-WASH and climate adaptation are strengthened.

Component 2: Climate-resilient rural WASH services, urban drainage infrastructure, WRM, and related local capacities adapted and scaled up to reduce climate and health risks in vulnerable communities

This component builds on the enabling environment to deliver climate-resilient services directly to communities. This will be achieved through **Outcome 2**: Climate-resilient rural WASH services, urban drainage infrastructure, WRM, and related local capacities adapted and scaled up to reduce climate and health risks in vulnerable communities.

The specific outputs for this outcome are:

- **Output 2.1**: CR-WASH services are accessible and used in rural, flood- and drought-prone areas of Ouham, Bamingui-Bangoran, and Vakaga.
- **Output 2.2**: Climate-resilient urban drainage infrastructure is reinforced and expanded in Bangui to reduce, anticipate, and better withstand flood risks.
- **Output 2.3**: Communities and youth are enabled to manage water resources and disaster risks in priority high-risk localities of Ouham, Bamingui-Bangoran, and Vakaga.

2. IDENTIFICATION OF BENEFICIARIES

The principal beneficiaries of this project are vulnerable populations in the four target prefectures (Bangui, Bamingui-Bangoran, Ouham, and Vakaga) who are highly exposed to the impacts of climate change on water, sanitation, and hygiene. The project will also benefit the national population through strengthened policies and institutional capacities.

Direct beneficiaries are defined as individuals, households, and institutions that directly participate in or receive adaptation benefit from project activities. This includes community members gaining access to new WASH infrastructure, government staff receiving training, and schoolchildren in facilities upgraded by the project.

Indirect beneficiaries are those who benefit from the project's broader impacts, such as improved national policies, enhanced early warning systems, and the positive spill-over effects of a more resilient WASH sector on public health and environmental quality.

Participation in community-level activities will be voluntary. To ensure equitable distribution and avoid double-counting, participation will generally be limited to one member per household for specific interventions, while ensuring benefits like safe water access are available to all household members.

Table 1. Beneficiaries mapping and project adaptation benefits

Beneficiary	Rationale	Involvement / Benefits
Vulnerable Communities and Households	Communities in the target prefectures face extreme vulnerability due to a combination of climate shocks (floods, droughts), widespread poverty, and some of the world's lowest access rates to safe water (6%) and sanitation (14%). Flooding regularly destroys infrastructure and contaminates water sources, while droughts intensify water scarcity. This leads to high rates of waterborne diseases, disproportionately affecting children, and places a severe burden on women and girls who are primarily responsible for water collection. Without intervention, these communities will remain trapped in a cycle of climate-induced poverty and poor health.	Vulnerable households will directly benefit from improved and reliable access to climate-resilient WASH services. This includes: ● 320,000 people gaining access to safe drinking water through the construction of 80 large-scale and 120 small-scale solar-powered water systems (Output 2.1). ● 141,000 people in communities becoming certified as Open Defecation Free (ODF) through a climate-sensitive Community-Led Total Sanitation (CLTS) approach, reducing their exposure to diseases (Output 2.1). ● 100,000 residents in Bangui benefiting from rehabilitated and expanded urban drainage networks, reducing their exposure to climate-induced floods and associated health risks (Output 2.2).
Schoolchildren, Teachers, Patients, and Health Workers	Schools and health facilities in CAR have critical deficits in WASH infrastructure. Over 81% of primary schools and 71% of healthcare facilities lack basic water supply. This situation compromises hygiene, increases the risk of disease transmission, and disrupts education, particularly for adolescent girls who may miss school due to inadequate menstrual hygiene facilities. Climate shocks like floods and droughts further damage what little	The project will directly improve the learning and health environments for thousands of children and patients. These beneficiaries will gain access to safe and resilient WASH facilities, reducing their vulnerability to climate-sensitive diseases and ensuring service continuity during extreme weather events. Benefits include: ● Schoolchildren and healthcare facility users benefiting from improved sanitation and hygiene through the installation of 200 rainwater harvesting

	infrastructure exists, forcing closures and reducing access to essential education and health services when they are needed most.	systems and the construction of climate-resilient sanitation facilities in 100 schools and 100 healthcare facilities (Output 2.1). ● Training will be provided to school WASH clubs and health personnel on the operation, maintenance, and management of these new facilities (Output 2.1).
National and Sub-national Government Staff	Government institutions in CAR have weak capacity to implement climate change adaptation policies, particularly within the WASH sector. There is a critical shortage of qualified personnel in meteorology, water resource management (WRM), and disaster risk reduction (DRR). Limited technical skills, a lack of reliable data, and poor inter-ministerial coordination hinder the ability to plan, design, and manage climate-resilient infrastructure and early warning systems effectively.	The project will significantly strengthen the institutional and technical capacity of the government to lead climate action in the WASH sector. This will create a more sustainable enabling environment for long-term resilience. This includes: ● Institutional frameworks will be strengthened through the revision of key national policies and technical standards to integrate climate resilience (Output 1.1). ● Technical capacity for data collection and forecasting will be improved through the rehabilitation of hydrometeorological monitoring stations and the establishment of improved data systems (Output 1.2).
Local Community Leaders, Women, and Youth	Community engagement in climate adaptation and DRR is limited due to a lack of awareness, resources, and structured participation mechanisms. Women and youth, despite being heavily impacted by climate change, are often excluded from decision-making processes related to water management and disaster preparedness. This lack of local ownership and capacity prevents the development of tailored, sustainable, and effective community-led adaptation solutions.	The project will empower communities to take an active role in building their own climate resilience. This will ensure that interventions are locally owned and sustainable beyond the project's lifespan. This includes: ● 18,000 people across 45 communities will directly benefit from community-led WRM and DRR interventions, such as catchment protection and small-scale water retention structures, which they will help design and implement (Output 2.3). ● Local stakeholders, with a strong focus on including women and youth, will be trained in climate risk assessment, resilience planning, and disaster preparedness, empowering them to manage local water resources and respond to climate shocks (Output 2.3).
The Entire Population of CAR (Indirect Beneficiaries)	The entire population of CAR is affected by weak national policies, fragmented governance, and the absence of effective early warning systems for climate-related disasters. In a business-as-usual scenario, 94% of the population will continue to lack access to safely managed water, and all citizens remain exposed to the escalating risks of floods and droughts	Nearly all citizens could indirectly benefit from a strengthened national framework for climate resilience and disaster preparedness. The project's systemic interventions will create a safer and more secure environment for the entire country. An effectiveness coefficient of 60% in employed to account for a realistic achievement of an adaptation benefit. Benefits include:

without timely alerts, leading to preventable loss of life, livelihoods, and economic assets.	● 2.5 million people (90.7% of the population) will indirectly benefit from improved national policies and institutional governance that mainstream climate adaptation into the WASH and DRR sectors (Outputs 1.1 & 1.3). ● 266,305 people in targeted prefectures will directly benefit from improved Climate Information and Early Warning Systems (CIEWS) disseminated through radio and other channels, reducing their exposure to climate-induced disasters (Output 1.2). The reach of these systems will expand over time, benefiting a larger portion of the population.

3. PROJECT IMPACTS AND BENEFITS

The target scenario foresees a paradigm shift in the Central African Republic, promoting the development of an enabling environment in terms of practice, policy, and finance to support the mainstreaming of climate-resilient WASH services. The project is therefore expected to contribute to the following GCF Adaptation Results Areas (ARAs) and IRMF indicators:

- **ARA 1: Most vulnerable people and communities**
  - Core indicator 2: Direct and indirect beneficiaries reached
  - Supplementary indicator 2.4: Beneficiaries (female/male) covered by new or improved early warning systems
- **ARA 2: Health, well-being, food and water security**
  - Core indicator 2: Direct and indirect beneficiaries reached
  - Supplementary indicator 2.3: Beneficiaries (female/male) with more climate-resilient water security
- **ARA 3: Infrastructure and built environment**
  - Core indicator 2: Direct and indirect beneficiaries reached
  - Supplementary indicator 2.6: Beneficiaries (female/male) living in buildings that have increased resilience against climate hazards
  - Core indicator 3: Value of physical assets made more resilient to the effects of climate change and/or more able to reduce GHG emissions

The table below provides an output-wise breakdown of estimated beneficiaries, assumptions, and applicable result areas. A comprehensive list of numerical assumptions, alongside with sources, can be found in Annex 23b.

Table 2. Beneficiaries by output and result area

	Methodology and assumptions per beneficiary type and benefits	Direct beneficiaries				Indirect beneficiaries				Results area
		Male	Female	Incl. Children	Total	Male	Female	incl. Children	Total	
Outcome 1: Strengthened national policies, systems, and institutional capacity for climate-resilient WASH (CR-WASH) services, water resources management (WRM), and climate disaster risk reduction (DRR).										
Output 1.1: Climate change adaptation is integrated into national policies and regulations, and funding for adaptation is mobilized	**Beneficiaries** - National population that do not have access to climate resilient, safe, reliable WASH. Policies will provide an adaptation benefit through the acceleration of safe WASH access 27% of the rural population uses a basic water supply and 6% uses basic sanitation (WHO/UNICEF JMP 2023). None of the country's rural population has currently access to both basic water supply and sanitation, that are climate-resilient.	0	0	0	**0**	1228012	1336062	1,435,881	2,564,074	**ARA 2**
Output 1.2 Evidence based WASH, WRM, DRR, and EWS are informed by improved planning, MEL (monitoring, evaluation, and learning) framework, and data integration	**Beneficiaries** - National population that do not have access to climate resilient, safe, reliable WASH. Policies will provide an adaptation benefit through the acceleration of safe WASH access 27% of the rural population uses a basic water supply and 6% uses basic sanitation (WHO/UNICEF JMP 2023). None of the country's rural population has currently access to both basic water supply and sanitation, that are climate-resilient. (overlap with Output 1.1)	0	0	0	**0**	1228012	1336062	1,435,881	2,564,074	**ARA 2**
Output 1.3: Institutional capacity and governance for CR-WASH and climate adaptation are strengthened	**Beneficiaries -** Population with access to EWS notification in rural locations, through radios they have reduced exposure to climate induded disasters. Assumptions - Population with access to radio in the rural prefectures will receive information and make informed decisions.	127,541	138,764	149,131	**266,305**	18,443	20,065	21,565	38,508	**ARA 1**
	Of which not overlapping with CR-WASH beneficiaries in rural communities	0	0	0	**0**	0	0	0	**0**	
Outcome 2: Climate-resilient rural WASH services, urban drainage infrastructure, WRM, and related local capacities adapted and scaled up to reduce climate and health risks in vulnerable communities..										
Output 2.1: CR-WASH services are accessible and used in rural,	Beneficiaries - community members with access to climate resilient WASH services - 80 large water system network (80*3250 persons) AND 120 small scall network (120*500 persons) : directly targeted by	153,258	166,742	179,200	**320,000**	0	0	0	**0**	**ARA2**

flood- and drought-prone areas of Ouham, Bamingui-Bangoran, and Vakaga	project activities and receive an adaptation benefit through improved access to safe water - Rainwater harvesters in 100 schools and 100 health facilities - 300 school children, and 1500 healthcare facility users: directly targeted by the project activities and have an adaptation benefit as they have reduced vulnerability to climate sensitive diseases from improved sanitation. (Partial overlap with open defecation free communities:)									
	Beneficiaries - 141,000 total, (including 84,600 / 300 villages not already counted under Water Supply beneficiaries), individuals are members of open defecation free communities: directly targeted by the project activities and have an adaptation benefit as they have reduced vulnerability to climate sensitive diseases from improved sanitation. Assumptions based on 200 intervention villages located in the more densely population Ouham prefecture, with an average 330 people per villages (this is the average size of past CLTS intervention villages in CAR, based on the national CLTS database) 300 villages located in the less densely populated prefectures of Bamingui-Bangoran and Vakaga, with an average size of 250 ppl/village. Size of villages based on available, indicative local population data (Partial overlap)	67,529	73,471	78,960	**141,000**	0	0	0	**0**	**ARA2**
	Of which not overlapping 84,600 / 300 villages not already counted under Water Supply beneficiaries	40,517	44,083	47,376	**84,600**	0	0	0	**0**	**ARA2**
Output 2.2: Climate-resilient urban drainage infrastructure is reinforced and expanded in Bangui to reduce, anticipate, and better withstand flood risks	Beneficiaries: - 100,000 recipients of drainage networks infrastructure in Bangui : directly targeted by a project activity and have an adaptation benefit of reduced exposure to climate induced floods	47,893	52,107	48,000	**100,000**	420,957	457,996	421,897	878,953	**ARA 3**
Output 2.3: Communities and youth are enabled to manage water resources and disaster risks	Beneficiaries: - 2.3.3: 18000 people and 45 communities benefitting from WRM and DRR interventions: directly targeted by a project activity and have an adaptation benefit of reduced exposure to climate induced floods (overlap with CR-WASH beneficiaries in rural communities)	8,621	9,379	10,080	**18,000**	0	0	0	**0**	**ARA 2 & ARA 3**

in priority high-risk localities of Ouham, Bamingui-Bangoran, and Vakaga	Of which not overlapping with CR-WASH beneficiaries in rural communities	0	0	0	**0**	0	0	0	**0**	
ARA1 beneficiaries		127,541	138,764	149,131	**266,305**	115,765	125,951	135,361	**38,508**	**ARA1**
ARA2 beneficiaries		193,775	210,825	226,576	**479,600**	2,364,147	2,572,164	2,764,334	**2,564,074**	**ARA2**
ARA3 beneficiaries		175,434	190,871	197,131	**118,000**	641,926	698,407	838,524	**817,461**	**ARA3**
Total beneficiaries*		241,668	262,932	274,576	**504,600**	2,364,147	2,572,164	2,764,334	**2,564,074**	**All**

The project identifies beneficiaries across three GCF ARAs. As the CAR is a Least Developed Country with overlapping vulnerabilities, interventions across the different ARAs will often apply to the same beneficiary groups. To ensure accuracy and avoid double-counting in the final tally, the following rationale was applied:

- **ARA1: Most vulnerable people and communities**
    - Beneficiaries under this result area are primarily those who gain coverage by new or improved early warning systems (EWS). Direct beneficiaries include 266,305 people who will be covered by new or improved EWS that reduce their exposure to climate-induced disasters. Indirect beneficiaries include 38,508 people who stand to benefit from new or improved EWS without being directly accessed through notifications.
- **ARA2: Health, well-being, food and water security**
    - This result area covers individuals who receive direct improvements in their health and water security through access to climate-resilient infrastructure. Direct beneficiaries include 320,000 people gaining access to safe water, 141,000 people in communities certified as Open Defecation Free (ODF), and 18,000 people benefiting from community-led water resource management (WRM) and disaster risk reduction (DRR) interventions. The total direct beneficiaries for ARA2 are 404,600 (after accounting for overlaps). Indirect beneficiaries are those in the wider communities who benefit from reduced disease transmission and improved public health.
- **ARA3: Infrastructure and built environment**
    - Beneficiaries in this category are those protected by new or rehabilitated physical infrastructure. This includes 100,000 people in Bangui who will benefit from improved urban drainage networks that reduce flood risk. Indirect beneficiaries are the remaining population of Bangui.

To estimate the project's total reach and avoid double-counting across ARAs:

- The grand total of direct beneficiaries (504,600) is calculated in two steps. First, by summing the unique individuals reached by each distinct intervention: water access (320,000), ODF communities (141,000), urban drainage (100,000), community WRM/DRR (18,000), and early warning systems (266,305). Then, by deducting people counted multiple times (all EWS beneficiaries, 56,400 ODF beneficiaries, and all WRM/DRR beneficiaries, are already counted as water access beneficiaries).
- The grand total of indirect beneficiaries (2,564,074) is calculated from CAR population estimates (indirectly benefitting from policy measures) and deducting direct beneficiaries.