FP035 Climate Information Services for Resilient Development Planning in Vanuatu (Van-CIS-RDP)

Annual Performance Report CY2020

Section 1: General Information

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Please note that this is section 1 of the six Annual Performance Report (APR) sections. APR will be considered valid only after all the six sections and the additional section on COVID-19 are filled with relevant details.

1.1 Please indicate if information provided in this APR is disclosable outside the Green Climate Fund. *

[X] Yes - The Accredited Entity agrees that the information reported is disclosable.

[ ] No - The information reported is partly confidential. The disclosable version of the APR will be attached.

If you select the second option [No - The information reported is partly confidential. The disclosable version of the APR will be attached], please follow the below steps.
- Step 1: Fill in all the sections of the APR with disclosable information.
- Step 2: Save each section using the 'Open as PDF' function provided in the top-right corner. (Do NOT submit an APR at this step).
- Step 3: Attach all these disclosable six sections, including an additional section on COVID-19, to the attachment boxes below, which will be shown once you check the second option only.
- Step 4: Update all the sections of the APR below with non-disclosable information.
- Step 5: Submit the non-disclosable APR with an attachment of the disclosable APR in the PDF format.

1.2 Please indicate if this report has been shared with the relevant NDA(s) for this Funded Activity

Yes

Once the APR is created in the PPMS, please use the 'Open as PDF' function to download the report in PDF format and to share with relevant authorities (i.e. NDAs) before submission. Select 'Yes' only if shared to ALL the relevant NDA(s).

Please Indicate the date of submission to NDA(s)

2021-03-23

If the APR is submitted to multiple NDAs, please indicate the latest date of submission to NDA, and provide the other dates per NDA in the further explanation box below.

Please provide further explanation, if any:

1.3 Funded Activity Title (Project/Programme Title)

Climate Information Services for Resilient Development Planning in Vanuatu (Van-CIS-RDP)

(Information is locked for editing)

1.4 Funding Proposal Reference Number

FP035

(Information is locked for editing)

1.5 Board Meeting Number

15

(Information is locked for editing)

1.6 Accredited Entity contacts for this APR

Full Name

Secretariat for the Pacific Regional Environment Programme (SPREP)

E-mail Address

melaniek@sprep.org

Phone Number

+685 21929 ext 346

1.7 Executing Entity(ies)

Full Name of Executing Entity

Vanuatu Meteorological and GeoHazards Department (VMGD)

Full Name of Executing Entity

Secretariat for the Pacific Regional Environment Programme (SPREP)

1.8 Project Duration

From

2018-01-10

To

2022-01-10

1.9 Current Year of Implementation

2

Indicate the year number, e.g., '2'

1.10 Annual reporting period covered in this report

From

2020-01-01

To

2020-12-31

Confirmation and Acknowledgement of Information *

* This is a required question to submit section 1 of the Annual Performance Report (APR).

[X] The accredited entity hereby confirms that the information provided in section 1 is complete and ready for submission.

Section 2: Implementation Progress

Section 2: Implementation Progress

Please note that this is section 2 of the six Annual Performance Report (APR) sections. APR will be considered valid only after all the six sections and the additional section on COVID-19 are filled with relevant details.

2.1 Overall (summary) project progress

Overall Progress

The Project's implementation phase has continued to be challenging due to:
(a) continued delays in GCF approval of documentation responding to the FAA conditions. For example, the documentation was provided in early March however, continued requests for additional information, changing the interpretation of conditions and delays in the final approval saw delays until October
2020.
(b) delays in disbursement of funds to enable ongoing activity. For example, the third disbursement was not approved until October 2020, leading to delays
of all activities in the second half of the year.
(c) Vanuatu was impacted by Tropical Cyclone Harold in March 2020, including significant damage at one of the project's key sites in Santo. The project team was mobilised to assist with the recovery efforts, and internal travel restrictions impacted on the ability of the team to undertake on-ground activity.
(d) The COVID-19 pandemic has had significant impacts on projects in the Pacific region, due to ongoing border closures of all Pacific countries (not including repatriation flights). The inability of external partners and the Implementing Entity to travel to Vanuatu has restricted on-ground activity and management of the project to ensure continued effective implementation. Whilst virtual mechanisms have been put in place, these do have limitations as
to what can be achieved. The continued impacts of COVID-19 restrictions on travel in the region are continually monitored and activities adjusted.

However, despite these challenges results have been achieved, particularly in the first half of the year prior to the lack of funding impacting on activity roll-out. The second half of the year highlights the halting of implementation for most activities due to the lack of funds.

Implementation Achievements in reporting period

A summary of key achievements during the reporting period include:
 CSIRO have developed a conceptual modelling approach to enable the use of the CMIP projections at the island scale, where local bathymetry, dynamics and chemistry communicate how climate change will be felt at the local (coastal) scale. This work leverages “state of the art” model-ling work at CSIRO developed for the Great Barrier Reef and involved the development of an unstructured grid, using COMPAS (https://research.csiro.au/cem/software/ems/hydro/unstructured-compas/) for the eastern side of Santo. This is very exciting and novel allowing CSIRO to increase resolution to represent key and important processes, while capturing the link between the ocean and coast.
 Work on the long-term climate projections for Vanuatu has continued with analysis and preparation of updated national projections for rainfall and temperature commencing. Preliminary tropical cyclone synthetic track simulations have been generated, and modelling design and methodology for projections for extreme rainfall and extreme temperature have been developed.
 VMGD’s climate data has continued to be improved and upgraded through the data rescue, digitisation and homogenisation activities. The VMGD are being trained and mentored by the Bureau of Meteorology and are improving their internal capacity on data management e.g. initial training in data management was strongly attended by 14 participants with early feedback indicating the need and value of the training.
 A total of nine synoptic stations and two automatic weather station sites have been digitised during the reporting period. These key stations contribute to climate information services that are crucial for sectoral planning. The stations include; (a) Sola Meteo, (b) Pekoa, (c) Lonorore Airport AWS, (d) Lamap AWS, Bauerfield, (e) Port Vila AWS, (f) White Grass, (g) Anelghaohat, and (h) Saratmata Meteo.
 The Vanuatu Climate Services for Agriculture (VaCSA) agro-met service portal platform prototype (temporary URL: http://vacsa.epinet.kr:9091/login.do) has been established, with the Crop Climate Diary (CCD) incorporated. Based on the initial analysis on the weather observation and forecast information flow and the database structure at VMGD, the VaCSA database currently has access to one of the VMGD database for eight AWSs. It is now ready for new agro-met service contents to be added onto the VaCSA platform.
 The Crop Climate Diary (CCD) is being used in two field trial plots in Port Vila and Luganville. Target crops for VaCSA such as taro, cassava, yam, sweet potato, island cabbage were planted sequentially by DARD and VARTC on both field trial plots, respectively. The field trials are ongoing for now, and will generate modelling-quality agricultural data by the end of 2020, which will later be used for agromet modelling to develop agromet services on VaCSA.
 APCC has developed a software to produce high quality rainfall anomaly analysis for the AgroMet Bulletins, and has conducted a training on how to utilize this software. APCC has also conducted extensive digitization of soil maps for smart agriculture. Prior to this activity, Vanuatu only had access to printed soil maps. With the ouputs of this activity, Vanuatu will now have high quality digital GIS soil information.
 APCC developed the MonthlyAgMetBulletin generator to enable the manual production of monthly agro-met bulletin by VMGD and the agriculture sector coordinator without support from VaCSA IT system. The MonthlyAgMetBulletin generator produces high quality rainfall anomaly analysis for use in agro-met bulletins. This is an additional resource produced outside of the original workplan, and undertaken in response to restrictions of COVID-19

limiting APCC's ability to travel to Vanuatu.
 The ICT assessment of VMGD's capability has been completed with recommendations to strengthen both equipment and human capacity. These recommendations are now under initial implementation.
 The cost-benefit analysis on the Doppler radar was completed and submitted in July, thus meeting the final outstanding condition under the FAA.
 Collaborations aimed at raising awareness to address water safety issues during the current active La Nina event have been undertaken with the WASH programme. This has been particularly important given the recent flooding events in Sanma Province which saw 25 confirmed cases and five deaths due to leptospirosis over the past six months.
 Work has continued on the traditional knowledge data collection and collation of new traditional knowledge and monitoring of environmental indicators, animal and plant behaviour from existing sites. New traditional knowledge observations network where additional data can complement existing knowledge and information have also been established.

Delays and Challenges to Implementation

Key delays and challenges to the implementation include:
 Delays in GCF approval on submitted documentation pertaining to the FAA conditions.
 The cost-benefit analysis on the radar (Condition 9.02(e)) whilst completed on-time under the contract, delayed final approvals on FAA conditions.
 No funding disbursements have led to a halting of activities until such time as the GCF approval for meeting the FAA conditions and the 2019 APR, and subsequent release of funds.
 Tropical Cyclone Harold in March 2020 caused widespread damage and the implementation of State of Emergency conditions in Vanuatu. This limited travel, led to some damage of equipment under the project and diverted personnel from the project to assisting with the post-cyclone assessments.
 The COVID-19 pandemic has led to initially no internal travel, and continued no external travel to Vanuatu for over a year, leading to an inability of the technical delivery partners and the Implementing Entity to travel to Vanuatu to undertake on-ground activities with the team.
 Difficulties have been experienced with the on-ground project management. Various mitigation actions have been discussed with the Executing Entities and actions put in place to minimise impact and support the Executing Entities and PMUs.

Lessons Learnt

A key challenge has been the lengthy delays in approval from the GCF on the FAA conditions and the continual requests for further information, clarification of information and at times, the upgrading of the requirements under the conditions (e.g. the procurement of the radar is now dependent upon receipt of five quotes prior to the GCF approval of the procurement to go ahead). Furthermore, the delays experienced in the review and final approval of the annual report (of which disbursements are placed against) has also led to delays in funds being received. This has led to partners having to halt activities and move their staff onto other projects. With the receipt of the third disbursement, partners have had to remobilise staff which has taken time. Furthermore, there remain concerns around further delays in funding disbursements which will lead to continual hold-ups on implementation of activities. A lesson for the GCF is: (a) the need to ensure quick and effective approvals of necessary conditions and reports to ensure no delays in implementation are experienced and (b) consideration of funding disbursements to IAs not been linked to annual reports if approval delays are going to be experienced.

The project management of the project by the Executing Entities remains challenging due to inexperienced staff. For future projects, this should be mitigated against by ensuring there is a clear understanding of requirements of an EE/PMU and in ensuring the project management unit is experienced and has the capacity to undertake the tasks required.

The Mid-Term Review is scheduled for May-June 2021 with procurement of the review team currently underway. The MTR will focus on the execution of the project on-ground with the expectation to provide further recommendations as to strengthening the on-ground project management and implementation to ensure activities can be undertaken and achieve results within the remaining timeframe of the project.

Provide a narrative report describing the overall progress on the implementation of the funded activity, focusing on implementation achievements, delays, and challenges according to the planned activities. As relevant, include references to other sections of this report (including Annexes or Attachments). Include a description of key milestones of the funded activity achieved during this reporting period including any deviations from original expectations. Also, describe challenges encountered and actions undertaken to resolve these challenges, and lessons learned during the implementation, including issues related to non-compliance with GCF standards or conditions, if any. In parallel, include positive achievements and better-than-expected results. If any issues have arisen in the last twelve (12) months of implementation that may result in a change to the scope and/or timing of the project, please provide a description of those items and how they have impacted the implementation period and final targets. Kindly make sure that this section just gives an overall summary and doesn't have overlap with other sections.

2.2 Performance against the GCF investment criteria (summary)

The project is too early in its implementation phase to provide concrete progress and evidence against the GCF Investment Criteria as much of these relate to the end-of-project results. However, preliminary reporting is outlined below.

Provide a narrative report describing the progress on the funded activity's performance against the GCF investment criteria framework. The performance should be compared against the initial assessment provided in the Board-approved Funding Proposal (section E). The list of the investment criteria as per the current framework is provided below. For each investment criteria outlined below, please include an assessment of current status, changes, progress and impact of the project as well as any impact of project context on the project during this reporting period against the initial baseline scenario and planned activities as per the assessment presented in the approved Funding Proposal. This sub-section 2.2 is not applicable for REDD+ Results-Based Payments Projects. Please write 'Not Applicable' as the response.

Relevant Links

The GCF investment criteria framework

2.2.1 Impact Potential

Expected total number of direct and indirect beneficiaries, (reduced vulnerability or increased resilience); number of beneficiaries relative to total population (PMF-A Core 1), particularly the most vulnerable groups

Current Status: No change

Changes: The number of direct and indirect beneficiaries has been updated in the Project Logframe as part of the revised work programme and budget as per the FAA conditions. The revised direct and indirect beneficiaries improve alignment with activities, project sites and identified beneficiaries. The updated information on beneficiaries is available on the logical framework.

Progress and Impact: Activities have been halted in the second part of the year due to delays in the approval of submissions to meet the FAA conditions and funding disbursements. Therefore, there has been minimal to no progress during the reporting period.

Degree to which the activity avoids lock - in of long-lived, climate-vulnerable infrastructure

Current Status: No change

Changes: Initial implementation commenced.

Progress and Impact: The project is contributing towards this investment criteria through supporting climate information services to mainstream into key infrastructure policies and guidelines. Implementation has been delayed whilst awaiting approval of the submissions to meet the FAA conditions and funding disbursements.

Expected strengthening of institutional and regulatory systems for climate-responsive planning and development

Current Status: No change.

Changes: Initial implementation has commenced.

Progress and Impact: Whilst some initial actions have been undertaken i.e. dialogues with the Departmental stakeholders, much of the activity relating to the strengthening of institutional and regulatory systems has been delayed due to the delay in funding disbursement.

Expected increase in the generation and use of climate (and required associated) information in decision making

Current Status: No change

Changes: None.

Progress and Impact: This action is recognised as a longer-term outcome from the Project which aims to develop and strengthen climate information into decision-making.

Expected strengthening of adaptive capacity and reduced exposure to climate risk

Current Status: No change

Changes: None.

Progress and Impact: Given the status of the Project at the time of report submission, significant progress against this investment criteria has not occurred, however, it is acknowledged this will be a longer-term outcome of the Project as results start showing in the midpoint of implementation. Initial progress has been made in the development of tools and models aimed at strengthening adaptive capacity and reducing exposure to climate risk within Sectors e.g. the Crop Climate Diary (Activity 1.2.6), long-term climate projects (Activity 1.2.3), and mapping of 'hotspots' (Activities 1.2.4 and 1.2.5).

Expected strengthening of awareness of climate threats and risk reduction processes

Current Status: No change

Changes: Some initial awareness raising activities have been undertaken during site visits and discussions with the target sectors. However, it is too early to measure any ongoing impact at this stage.

Progress and Impact: Some work has been undertaken in discussions with Sectors to highlight the importance of climate information in decision-making. Furthermore, during the site assessments to detail the work programmes, stakeholder consultations were undertaken during which time, information sessions on climate threats and the use of climate information to better prepare communities was undertaken. Following the receipt of funds, this activity will commence full implementation particularly through the recent appointment of the community coordinator who is tasked with developing this area at the local community level.

2.2.2 Paradigm shift potential

Existence of a monitoring and evaluation plan and a plan for sharing lessons learned so that they can be incorporated within other projects

Current Status: Updated

Changes: M&E Plan is in development and will be completed by end March.

Progress and Impact: Work has commenced on developing the final M&E Plan for the project which is expected to be completed by end March 2021. Discussions have also continued with LORTA however, given the situation with the project, the LORTA approach to impact evaluation is deemed to be unsuitable for the project in its current state and the focus for M&E should be at the key result framework level in the next 18 months.

Arrangements that provide for long-term and financially sustainable continuation of relevant outcomes and key relevant activities derived from the project/programme beyond the completion of the intervention

Current Status: No change

Changes: None

Progress and Impact: There has been no further progress on this area since the six-monthly report (January – June 2020).

Extent to which the project/programme creates new markets and business activities at the local, national or international levels

Current Status: No change

Changes: None

Progress and Impact: The social and economics benefit assessment (Activity 2.3) will identify potential private investment in climate information services (refer above to update on progress and results to-date).

Scaling up the scope and impact of the intended project/programme without equally increasing the total costs of implementation

Current Status: No change

Changes: None

Progress and Impact: The project needs to be mobilised prior to any insights gained on the potential to upscale the project to other islands and villages in Vanuatu.

A theory of change for replication of the proposed activities in the project/programme in other sectors, institutions, geographical areas or regions, communities or countries

Current Status: No change

Changes: None

Progress and Impact: The theory of change provides a stronger Project framework and enables clearer messaging on the benefits and impacts of the Project – this will become important for future reporting and communication of efforts and impact.

2.2.3 Sustainable development potential

Degree to which the project or programme promotes positive environmental externalities such as air quality, soil quality, conservation, biodiversity, etc.

Current Status: Not applicable for this project

Changes: n/a

Progress and Impact: n/a

Potential for externalities in the form of expected improvements, for women and men as relevant, in areas such as health and safety, access to education, improved regulation and/or cultural preservation

Current Status: Not applicable for this reporting period

Changes: n/a

Progress and Impact: n/a

Potential for externalities in the form of expected improvements in areas such as expanded and enhanced job markets, job creation and poverty alleviation for women and men, increased and/or expanded involvement of local industries; increased collaboration between industry and academia; growth of private funds attracted; contribution to an increase in productivity and competitive capacity; improved sector income-generating capacity; contribution to an increase in energy security; change in water supply and agricultural productivity in targeted areas, etc.

Current Status: Not applicable for this reporting period

Changes: n/a

Progress and Impact: n/a

Explanation of how the project activities will address the needs of women and men in order to correct prevailing inequalities in climate change vulnerability and risks

Current Status: No change

Changes: Review remains in progress

Progress and Impact: The original Gender Action Plan is under review and seeks to ensure a better integrated approach to address the needs of men and women and ensuring the inequalities in climate change vulnerability and risks are being addressed. The development of the revised GAP has been delayed due to COVID-19 restricting travel into Vanuatu by the gender team to consult with communities and other relevant stakeholders. Plans are in place to appoint a local-based gender person to visit a selection of sites with the Community Coordinator and other relevant team members to undertake consultations – these will feed into the final gender action plan.

2.2.4 Needs of the recipient

Intensity of exposure to climate risks and the degree of vulnerability, including exposure to slow onset events
Size of population and/or social or economic assets or capital of the country exposed to climate change risks and impacts

Current Status: No change

Changes: n/a

Progress and Impact: Not applicable for this reporting period

Proposed project/programme supports groups that are identified as particularly vulnerable in national climate or development strategies, with relevant sex disaggregation

Current Status: No change.

Changes: No changes in this reporting period from the previous reporting period whereby updated sex disaggregation figures for target communities and Sectors were derived (see below).

Progress and Impact: The project is supporting climate information services in 12 communities in six provinces and across five priority development sectors (agriculture, fisheries, infrastructure, tourism and water). Figures on the number of direct and indirect beneficiaries including sex disaggregation have been updated into the Project's revised logframe (submitted to the GCF in February 2020) (refer 2.2.1 for revised figures). These figures will be used as the targets for the forthcoming monitoring and evaluation plan.

As outlined in this report, implementation has been delayed due to meeting the conditions of the FAA and receiving final approval from the GCF in releasing funds. Therefore, only site assessments and initial stakeholder engagement has been undertaken in order to develop the revised workplans. Once the approval has been received and funds disbursed, implementation of activities will be rolled out.

Level of social and economic development (including income level) of the country and target population (e.g. minorities, disabled, elderly, children, female heads of households, indigenous peoples, etc.)

Current Status: Not available at this time

Changes: n/a

Progress and Impact: n/a

Explanation of the existing barriers that create absence of alternative sources of financing and how they will be addressed

Current Status: No change

Changes: None

Progress and Impact: The case for investment in CIS, as a high return public good supporting resilient development is made throughout the project's original proposal, with some analysis suggesting an estimated benefit-cost ratio conservatively of 5.3:1, with an EIRR of 68%. The proposed activities and outcomes are well aligned with the objectives of the GCF and will address these barriers as detailed in the proposal. At this stage, and given the delay, in the implementation of the project, reporting against this investment criteria will occur closer to the mid-term point of the project.

Potential of the proposed programme or project to strengthen institutional and implementation capacity

Current Status: No change

Changes: None

Progress and Impact: A core element of the project is the capacity building and mentoring of VMGD and Sector personnel by the Delivery Partners (CSIRO, BOM and APCC) and by the Implementing Entity. This has been very effective to-date with specialised training workshops and ongoing mentoring being undertaken. Trainings / mentoring to-date have included:

 Data rescue, quality management practices, and broader WMO best practice data standards
 Data collection
 Use of climate tools in decision-making and planning
 Traditional knowledge collection, analysis and management
 Project and financial management

This has been successful in building the understanding of project personnel and stakeholders in these specific areas, leading to higher quality inputs being provided for activities and project management.

Furthermore, areas of strengthening institutional capacity are underway through activities including improvements to data portals and databases, updating VMGD's ICT infrastructure and software platforms, updating field trial standard operating procedures etc. This will lead to more experienced and skilled personnel, and stronger systems, in climate information and delivery.

2.2.5 Country Ownership

Programme or project contributes to country's priorities for low- emission and climate-resilient development as identified in national climate strategies or plans, such as nationally appropriate mitigation actions, national adaptation plans or equivalent, and demonstrates alignment with technology needs assessments, as appropriate

Current Status: No change

Changes: None

Progress and Impact: Project implementation has been delayed, however, with the meeting of the FAA conditions (October 2020) and subsequent release of funds, it is expected implementation will increase significantly in 2021. The outputs of the Project will contribute towards Vanuatu's priorities for low emission and climate resilient development via the following identified country strategies and plans:
 Vanuatu Framework for Climate Services (VFCS)
 National Sustainable Development Plan 2016 – 2030 (NSDP)
 Republic of Vanuatu National Climate Change and DRR Policy 2016 – 2030
 Vanuatu National Adaptation Programme of Action (NAPA)
 Republic of Vanuatu Second National Communication to the UNFCC (SNC)
 Vanuatu Meteorology and Geohazards Department Strategic Development Plan 2014 – 2023 (VMGD SDP)
 Pacific Roadmap for Strengthened Climate Services (PRSCS)
 Global Framework for Climate Services (GFCS)
 Vanuatu Agricultural Sector Policy 2014 – 2023 (VASP)
 Vanuatu Infrastructure Strategic Investment Plan 2015 – 2024 (VISIP)
 National Energy Roadmap 2016 – 2030 (NERM)
 Rural Road Access Strategy (RRAS) 2016
 Vanuatu Resilient Roads Manual (VRRM) 2014
 Vanuatu Resilient Roads Manual Design Guide
 Vanuatu Resilient Road Standards
 Vulnerability of Tropical Fisheries and Aquaculture to Climate Change
 Coastal Fisheries Strategy of Vanuatu, 2019
 Vanuatu National Fisheries Sector Policy 2016 - 2031
 National Ocean Policy 2016 (NOP)
 Vanuatu National Water Resource Strategy 2008 – 2018 (VNWS)
 Vanuatu Strategic Tourism Action Plan 2014-2018
 Vanuatu Tourism Action Program
 Provincial Tourism Plans
 Climate Change Adaptation in the Pacific Island Tourism Sector: Analysing the Policy Environment in Vanuatu
The forthcoming Monitoring and Evaluation Plan will identify and include monitoring and reporting tasks against relevant strategy outcomes as part of the Project's ongoing evaluation and reporting efforts.

Degree to which the activity is supported by a country's enabling policy and institutional framework, or includes policy or institutional changes

Current Status: No change

Changes: None

Progress and Impact: As seen in the indicator above, the project is well supported by Vanuatu's policy and institutional framework. The project has undertaken an early policy review within the target sectors (agriculture, fisheries, tourism, infrastructure and water) as part of the development of the Sector Action and Communication Plans. These in turn, have been utilised in developing more detailed work programmes for each Sector. Future work under the project will support Vanuatu's climate change country and sectoral objectives, as well as provide new information for use by policy and decision-makers.

Proponent demonstrates a consistent track record and relevant experience and expertise in similar or relevant circumstances as described in the proposed project/programme (e.g. sector, type of intervention, technology, etc.)

Current Status: No change

Changes: None

Progress and Impact: n/a

Proposal has been developed in consultation with civil society groups and other relevant stakeholders, with particular attention being paid to gender equality, and provides a specific mechanism for their future engagement in accordance with the Fund's environmental and social safeguards and stakeholder consultation guidelines. The proposal places decision-making responsibility with in-country institutions and uses domestic systems to ensure accountability

Current Status: No change

Changes: None

Progress and Impact: In late 2019 – early 2020, a series of stakeholder consultations were undertaken across the Sector-related project sites, and across the CIS communities targeted under the project. These consultations included stakeholder engagement and inputs into the future implementation plans of the Project, identified gender-related specifics and ensured the Project is building the platform at the sites from which to continue effective implementation of actions.

Furthermore, gender considerations are being incorporated across all activities under the gender action plan review which is ongoing (this has been delayed due to COVID-19 restricting travel both to Vanuatu and within Vanuatu). The revised GAP will provide the project team with a clear roadmap guiding all consultations both at Port Vila with Government and NGO stakeholders and in the Provinces within government, NGO and communities.

Lastly, the ESM Plan provides a roadmap of areas for focus throughout the life-of-project which has been implemented by the Executing Entities. This will be updated following an update to the Sector plans and the CIS community engagement plan.

2.2.6 Efficiency and Effectiveness

Proposed financial structure (funding amount, financial instrument, tenor and term) is adequate and reasonable in order to achieve the proposal's objectives, including addressing existing bottlenecks and/or barriers

Current Status: No change

Changes:

Progress and Impact: As per Clause 8(c) of the FAA, a revised workplan and budget was submitted to the GCF and approved in October 2020. The revised workplan and budget was required to further detail the project's proposed activities, outputs and deliverables, including a more detailed budget clearly outlining the level of financing required to achieve the proposal's objectives. The revised workplan and budget provides a clearly, laid out pathway forward for the project team to deliver upon the objectives and it ensures activities are adequately and appropriately funded. Discussions continue to be undertaken to continue to assess ongoing impacts of COVID-19 on the project – this is mainly related to the inability of partners (CSIRO, APCC, BOM and SPREP) to undertake on-ground activity.

Demonstration that the proposed financial structure provides the least concessionality needed to make the proposal viable

Current Status: No change

Changes: None

Progress and Impact: Refer above

Economic and financial rate of return with and without the Fund's support (i.e. hurdle rate of return or other appropriate/relevant thresholds)

Current Status: Not available

Changes: n/a

Progress and Impact: n/a

Description of financial soundness in the long term (beyond the Fund's intervention)

Current Status: No change

Changes: None

Progress and Impact: n/a

Explanations of how best available technologies and/or best practices, including those of indigenous peoples and local communities, are considered and applied

Current Status: No change

Changes: None

Progress and Impact: The Traditional Knowledge Strategy has been developed, however, additional work is continuing to ensure it is effectively integrated with the revised Sector plans and the to-be-developed community engagement plan (linking to the Community Climate Centres). Work on the implementation of the strategy has been limited during the reporting period due to the delays in project approval and funding disbursements.

2.3 Project Outputs Implementation Status

Use 'Add Row' button to add multiple outputs and/or activities reported against one output

Project Output Name

Output 1.1 Strengthened climate information services through improved data and interfaces

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.1.1: Improving the currency, functionality and visualization of climate data records for Vanuatu; Sub-activity 1.1.1.1. Update tropical cyclone and high-quality climate data for online Pacific Climate Change portals and VMGD centralised data management system (CliDE).

Status

Activity started - progress delayed

Implementation Progress

45 %

Progress for the relevant reporting period

Updates to the tropical cyclone portal continued throughout the reporting period. As a key component to the delivery of high quality data to the portals, it was identified that training would be required on data rescue, quality management practices and broader WMO best practice data standards. This was delivered by BOM as part of the broader 1.1.1 activity with follow up training originally planned for May 2020. This however was cancelled due to the COVID-19 pandemic, and BOM are exploring options for virtual or on-line training.

This activity was halted in the second half of 2020 due to delays in GCF approval on the FAA conditions and the subsequent delay in funding disbursements. The activity has been reactivated in early 2021 and future plans include online based learning due to ongoing impacts of COVID-19. The Bureau is well placed to deliver online based learning with this approach currently trialed by COSPPac and WMO CREWS PNG. This approach can be leveraged to avoid duplication. This activity will mostly be delivered as part of sub-activity 1.1.1.2. Once the data rescue and quality assurance is complete sub-activity 1.1.1.1 and 1.1.1.3 can be completed.

The training in data management in early 2020 was strongly attended with 14 participants (10 male, 4 female). Participants found the presentations and practical sessions to be interesting and easy to understand. Comments received included:

• This is very useful to climate staff'
• It is interesting to know the importance of QA & management.
• We identified gaps in our data management during these activities
• Learning and realising the importance of accurate data entry
• Very importance for all aspect of climatology
• A good start for us here at VMGD and we hope to include more staff (outer islands) observers in the workshop
• The training was excellent as some of us is new to data quality in meteorology. So this is a start of something exciting during Van-KIRAP project duration

A number of learnings and considerations for future workshops and data rescue/quality management work have emerged including:

• Installation or key upgrades to the climate database / software should be carried out prior to any training exercises that require access to these systems to allow for unexpected issues to be resolved and maintain a logical order to training.
• Training on data rescue / quality control needs to include components on data management and quality assurance, including understanding data and work flows and having standardised operating procedures (as was done during this training session), as it cannot be assumed that staff are familiar with these and understand their essential nature.
• Training materials were based on WMO guidelines and best practice.
• Staff turnover in the Pacific can be very high, emphasising the importance of regular training and refresher courses, providing training materials (such as copies of the presentations) for future reference and having easy to locate standard operating procedures and other relevant materials to ensure data quality standards and improved and maintained into the future.
• Complete software testing (including user testing) of systems installed by the BOM in the Pacific to help reduce bugs and ensure that the systems meet user requirements.

Risks, Assumptions, Issues & Dependencies
Data rescue conducted by VMGD is a key dependency to activities including 1.1.1.1, 1.1.1.2, 1.1.1.3, 1.1.2.1, 1.1.2.2, 3.2.1.1 and 3.2.1.2 among others. Data rescue work needs to be completed for prioritised stations (long records or key locations), then quality controlled, homogenised, followed by the calculation of WMO indices and upload to database and portals.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Undertake online based learning
Milestone #2: Complete data rescue work including quality control and homogenisation for prioritised stations
Milestone #3: Undertake calculation of WMO indices and upload to database and portals

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.1 Strengthened climate information services through improved data and interfaces

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Project Activity 1.1.1: Improving the currency, functionality and visualization of climate data records for Vanuatu; Sub-activity 1.1.1.2. Digitise historic climate records, enter into CliDE and quality assurance

Status

Activity started - progress on track

Implementation Progress

23 %

Progress for the relevant reporting period

This activity is well underway with the appointment of two climatologists who are responsible for the data rescue, digitisation and homogenisation, and subsequent training and commencement of the data rescue activities. The project has instituted a five stage process for the implementation of the data rescue and digitisation program.

The VMGD data team is being trained and mentored by the Australian Bureau of Meteorology (BOM) in data rescue and quality assurance techniques including: (a) Introduction to the key concepts of climate data management; (b) Climate data rescue techniques including locating and preserving climate records and maintaining inventories; (c) Introduction to key concepts of quality assurance and; (d) Climate data quality control including identifying and correcting suspect climate data.

Digitising data from synoptic stations and AWS's
Digitization work continued for the stations; (a) Sola Meteo, (b) Pekoa, (c) Longana Airport AWS, (d) Lamap AWS, Bauerfield, (e) Port Vila AWS, (f) White Grass and (g) Anelghaohat. Data rescue recently commenced at Saratamata station in September 2020 after the station has been down since 2018. Lamap records have also resumed data collections in October after the station was damaged by TC Harold in April 2020.

The climate parameters digitally coverted electronically into CLiDe include: air temperature (dry and wet bulb measurements); relative humidity (RH); atmospheric pressure; visibility as well as present and past weather to show how conditions on the site has evolved in the last 24 hours. These other climate variables are used to process quality assurance (QA) by way of re-affirmation of checks done on the main elements i.e rainfall and temperatures.

The data team has successfully electronically converted climate parameters into CLiDe including: air temperature (dry and wet bulb measurements); relative humidity (RH); atmospheric pressure; visibility as well as present and past weather to show how conditions on the site has evolved in the last 24 hours. These other climate variables are used to process quality assurance (QA) by way of re-affirmation of checks done on the main elements i.e rainfall and temperatures.. The progress of the digitisation work for the year is presented in the table below:

Table 1: Progress on digitisation work

Progress (%)
Station Name As at June 2020 As at December 2020
Sola Meteo 41.5% 83.2 %
Pekoa 58.4% 83.2%
Lonorore Airport AWS 60.4% n/a
Lamap AWS 26.2% 41.3%
Bauerfield 54.9% 83.7%
Port Vila 60.3% 87.5%
White Grass 48.9% 86.4%
Anelghaohat 54.9% 84.2%
Saratmata Meteo n/a 40.4%

In the first half of the year, more than 48,000 records from at least three (3) climate stations had been quality checked by the climatologist (data homogenisation). By the end of the reporting period work on the data homogenization and analysis included quality control checks for the most recent ten years of rainfall and temperature data for all Meteorological Stations. Approximately 12,000 records from at least two climate stations have been quality checked during the current six-month reporting period. These datasets cover the most recent ten years of rainfall, extreme maximum temperature and extreme minimum temperatures for Lamap and part of Bauerfield observation stations (refer table below for progress at each Station).

The quality controlled data sets covering rainfall, extreme maximum temperature and extreme minimum temperatures for (a) Sola, (b) Pekoa and (c) Aneityum observation stations are stored in the CLiDe Climate Database for future use in Activity 1.1.1.3.

The new quality controlled data sets have been incorporated into the existing CIS products eg the Vanuatu Climate Update. Recent VCU bulletins (see example in Figure 1 below) can be viewed on the following URL link:
https://www.vmgd.gov.vu/vmgd/index.php/climate/reports-and-summaries/vanuatu-climate-update.

Progress on data homogenisation

Station Name Progress (%) in years of overall dataset
Sola Meteo 53.8% (35 out of 65 years)
Pekoa 58.3% (35 out of 60 years)
Saratmata Meteo 15% (2 out of 13 years)
Lamap 18.9% (10 out of 58 years)
Bauerfield Meteo 29.7% (11 out of 35 years)
Port Vila AWS 20% (Rainfall data only available)
White Grass Meteo 3.2% (2 out of 62 years)
Anelghaohat Meteo 3.0% (2 out of 67 years)

Data Sorting and Updating
In early 2020 the data team supported the Climate Division with the reorganisation and cleaning of the National Climate Archives. The reorganisation of the paper records in the vault is to facilitate the smooth operation of the data digitisation process. The work includes sorting and updating of the archives inventory list; the prioritisation of key synoptic/climate stations and key climate parameters e.g rainfall, air temperature that will be the first priority. The key climate elements that are in the priority category are requisite for other activities that follow e.g Activity 1.1.1.3.

The National Climate Archives holds all historical climate records since 1890 from when climate observations began. The project team reorganised the filing and naming system of the climate archives to mirror BOM standards in data archiving and to provide a climate-controlled atmosphere in the vault. An air conditioning unit will be procured to ensure temperature consistency in the vault.

Archive Stocktake
In October 2020 the archive stocktake was completed – this was included in the BOM training on archival systems. The National Climate Archives comprises climate information occurring throughout Vanuatu from 1906 - 2018. Climate information from this period was manually recorded from observations in the form of observation field books, monthly registers, barographs, hydrographs, thermographs, anemographs, daily climatology and rainfall data.

Work on rearranging the archiving room was undertaken in 2015 including labelling of shelves, labelling of archive boxes and rearranging field books. However, a subsequent refurbishment of the archives in 2019 resulted in climate information being misplaced, incorrect labeling of the information, and climate information misplaced or grouped together. The work undertaken in 2020 on restoring the archives has resulted in recording, labeling and undertaking a stocktake of the inventory in the Archives.

Impact Database
An Impact Database was established to store data on past climate events and their impacts on Vanuatu. The improved format will assist the climate division, students, researchers, projects and other stakeholders in future research and will also assist in confirming past climate and weather events. The database is a work in progress and is still being populated.

Seasonal Forecast Bulletins
The work of managing climate data, and archival of data goes hand-in-hand with data requests from users of the raw data, and visualization of the data itself. During this period the team has worked on Efate island to provide monthly climate updates to stakeholders. This will further complement Activities 1.1.2 and 1.2.2 when it comes to transforming the bulletins into other forms of user interface platforms for the CIS tools.

Challenges to digitisation and homogenisaton of data
The process to digitise and homogenize historical data highlights a number of challenges including:

• Despite the data undergoing quality assurance checks in the CliDE database, the data has not been corrected or flagged, thus affecting the quality of data being used to prepare climate data requested by clients. These datasets will undergo a homogenised process using the R-software and associated statistics analysis. Training in this was scheduled for 2020 however, due to the COVID-19 travel restrictions, this was unable to take place. This training for VMGD staff is required before the project can institutionalise the new data processing procedure into the system. Additionally, new standard operating procedures for this process will need to be incorporated into the Climate Manual.
• Data is not always available in the database or still requires digitisation. This becomes a challenge as clients either need to wait for the data or digitize it themselves.
• There are occasions where AWS and manual weather observations highlight large differences in rainfall records. The challenge is to recognise when one of these two stations commence recording faulty measurements/readings.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Undertake online based learning
Milestone #2: Complete data rescue work including quality control and homogenisation for prioritised stations

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.1 Strengthened climate information services through improved data and interfaces

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.1.1: Improving the currency, functionality and visualization of climate data records for Vanuatu; Sub-activity 1.1.1.3. Updated standardised WMO climate extreme indices

Status

Activity not yet due

Implementation Progress

2 %

Progress for the relevant reporting period

The activity will upgrade the Vanuatu climate extremes components hosted on the Pacific Climate Change Data Portal and with the new data new climate extreme indices tailored for each sector is developed to detect climate change viariations. The new homogenised data updates all relevant to climate extreme indices are updated and available for Vanuatu.

As part of improving the currency, functionality and visualisation of climate data records for Vanuatu, once the records have been digitised, extending the records available, WMO climate extreme indices will be calculated which will provide information on variability and change of climate extremes (rainfall and temperature) in Vanuatu. Following WMO best practice, this will be done for stations with long enough records and in key areas for the five priority sectors. As part of this work, input has been sourced on priority stations and regions for delivery partners and VMGD to ensure this is captured.

Sub-activities 1.1.1.2 will need to be mostly completed before calculation of the indices should commence to ensure most data is included in the calculation of WMO indices and subsequent services underpinned by the data planned in the project (noting the update can be rolled forward, and done concurrently with sub-activity 1.1.1.2 but will mean less data is included in the update).

To progress this further, a face to face workshop and training for VMGD staff on the methodology and theory was planned for the second half of 2020 or early 2021 depending on SOE lockdown protocols to progress this key activity. Given the continued restrictions, alternative options such as online training is being considered.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Online training for data management

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.1 Strengthened climate information services through improved data and interfaces

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.1.2: Building and strengthening user interfaces to support CIS Decision-making; Sub-activity 1.1.2.1. Upgrade VMGD IT platform including computing hardware and software

Status

Activity started - progress on track

Implementation Progress

15 %

Progress for the relevant reporting period

This activity supports the development of the existing central VMGD ICT infrastructure and software platform which links all incoming and outgoing climate information services (CIS) and early warning services (EWS) information and products.

The activity commenced with a one-off assessment of the ICT platform within VMGD, including computing hardware and software. The objective of the ICT assessment was to undertake needs and specification assessment, recommend uplift options and develop requisite programmes, installation of equipment, equipment budget (costings) to ensure requisite hardware is in place. Hardware will also allow for requisite information and knowledge data storage to be accessible via various interfaces.

The final report was submitted to the PMU in June 2020 and provides recommendations on VMGD IT platform. The assessment covered a number of areas which includes: (a) ICT Personnel; (b) Software Development; (c) Software depository; (d) Data Governance; (e) Backup; (f) Archival; (g) Current Infrastructure/software; (h) Future state; (i) Website for CLEWS/CIS. The assessment report proposed the following recommendations for (a).'Future Infrastructure state' and (b). 'Software Development'. This includes:

a. Future Infrastructure state
The ICT hardware equipment recommended to support the future infrastructure state are out-lined in the following table.

ITEM Qty COST
FX2 chassis 1
FN2210s aggregators 2
FC640 Server Nodes 3
350F SAN with 50TB Storage
Routers
Firewall Appliance
Tape Backup
Total Cost $150,000

b. Software development
Recommendations for software development include:
• A VMGD source code repository (e.g. Gitlab) to be established and all developers should be encouraged to use this.
• An architectural "Community of Practice" or committee be formed and they consult and recommend on best practices for software development. This may include the technical stack, coding standards and other issues related to good software hygiene.
• Core software stacks be prescribed and appropriate staff are given training and support in developing skills in these software stacks.
• Developers be provided with training in modern software development including test driven development and agile programming.
• Where software is developed to be deployed into production, it is to be cognisant of three environments - development environment, staging environment and production environment.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Procurement of the ICT equipment including development of the term of reference and specifications for equipment.
Milestone #2: nstallation of the ICT equipment, and appropriate training of VMGD ICT staff.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.1 Strengthened climate information services through improved data and interfaces

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.1.2: Building and strengthening user interfaces to support CIS Decision-making; Sub-activity 1.1.2.2. Technical support for VMGD in developing CLEWS-based software application development and ground-truthing CLEWS and outreach to Next/End-Users

Status

Activity started - progress on track

Implementation Progress

20 %

Progress for the relevant reporting period

The BOM has been providing key technical support and information to VMGD (in consultation with project management) to ensure the project is supported in the delivering of range of activities. To support VMGD long term capability there was a need identified to uplift ICT capabilities. The BOM provided its experts to asses VMGD requirements and current ICT capability to identify needs and gaps and how to address these to ensure VMGD has a fit for purpose ICT capability able to support Climate Information Services.

The assessment evaluated and established ICT / CLEWS baselines and provided recommendations on the development and application of CLEWS-based software for the project. The report provides recommendation for 11 different ICT areas ranging from upstaffing, utilisation of cloud technologies, training, observations, automation, documentation of services and processes as well as hardware requirements (refer above sub-activity).

The assessment report noted that VMGD has a relatively small staff for the number of systems that are required to be maintained. The staff appear to be highly skilled and competent across a number of skill sets. Whilst there is some overlap across skill sets and system knowledge, it was noted there needed to be consideration of building skill sets for overlap in core areas to ensure any gaps (e.g. through leave, sickness or resignations) are covered adequately to enable critical systems to continue to be online effectively. The assessment report recommended the following actions for consideration:

a. VMGD are to consider increasing the number of IT staff to ensure current systems are adequately resourced, and to ensure succession planning is in place to cover staff absences or resignations.
b. VMGD to consider the employment of at least one DevOps engineer. The role would require a specialist who has development and system administration expertise.

The assessment report also recommended training for suitable IT staff in the following technologies (a) Virtualisation; (b) Cloud technologies and (c) Containerisation (eg Docker). In addition the report goes further to suggest other divisions of VMGD would benefit from more IT literate trainings such as knowledge and skills in (a) Programming - Python has been found to be a particularly useful skillset for developing small models, automating tasks, data transformation and generating products; and (b) Operating systems skills - Linux skills (e.g. learning Bash and understanding Linux) has proved to be useful to staff at the Australian Bureau of Meteorology. The assessment also discussed uplift options for the VMGD website for CIS (and CLEWS).

The report also highlighted the need for a review of operations. For example, it was noted there is currently a lot of content on the CIS pages that is manually generated and delivered. Much of this could be partially or fully automated. The report recommended VMGD review and consider which components could be easily automated to reduce the need for staff to manually update. The short to long-term implementation moving forward will be guided by the assessment report and its recommendations in alignment with budget and procurement considerations.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Ongoing training and mentoring by BOM as required.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.1 Strengthened climate information services through improved data and interfaces

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.1.2: Building and strengthening user interfaces to support CIS Decision-making; Sub-activity 1.1.2.3. Vanuatu Climate Futures portal for delivery of climate change projections

Status

Activity started - progress on track

Implementation Progress

15 %

Progress for the relevant reporting period

The preliminary planning and design for the proposed Van KIRAP portal (also referred to previously as working title Vanuatu Climate Futures portal) has been undertaken and completed. This includes the development and demonstration of a beta-version portal construct to describe the operational architecture and likely functionality of the portal.

The portal design is being developed using an agile approach which is considered useful for software development activities of this type. It will also provide the Van KIRAP project with the flexibility to target the sector needs as these might vary over the course of the project. The approach requires early user engagement (emphasis on co-design/co-production between the CSIRO DP team and target users) on the priority sectoral requirements for the CIS Portal, with development concentrating on operational workflows which can be deployed linking portal development to sectoral and other end-users early in the project for feedback. A detailed report is available outlining the approach and key design criteria for the development of the CIS Portal, plus an overview of the beta version portal.

In the second half of the year, the activity was halted due to lack of funding, however, planning and design of the Van-KIRAP portal continues to be in progress with the intention to quickly re-engage with SPREP, VMGD and sectoral stakeholders in Vanuatu for next steps in relation to the design and building of tasks outlined in the CSIRO work plan. This process is also leveraging separate and new CSIRO capability and investment (i.e. above and beyond existing CSIRO contractual co-investment obligations to the project) into parallel development of the new INDRA Pacific digital climate intelligence platform. The potential use of the new INDRA Pacific back-end technical architecture for Van-KIRAP is being explored including the ability to leverage CSIRO's new partnership with MicroSoft for enhanced access to MS Azure cloud computing and data storage capability. This has potential implications for significantly enhancing the functionality and utility of the Van KIRAP portal during the project's out years.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Develop beta version VCF portal IT platform (Version 1) including base level features and functionality for preliminary end-user testing
(a) Re-engage stakeholders to develop the design and building of tasks connected to the portal.
(b) V1.1 user testing completed and results/feedback integrated into design criteria for (V1.2) VCF portal development

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.1: Upgrading and expanding the Vanuatu observational networks; Sub-Activity 1.2.1.1. Enhancing stream monitoring capabilities in the Sarakata River catchment

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

The enhancement of stream monitoring capabilities is integrated to the Water Sector case study (refer Activity 2.1.4). The site assessment results were incorporated into the Water Sector Plans and implementation workplans for the project. Ongoing activity has been delayed in 2020 due to negotiations to meet the conditions of the FAA and therefore approval of ongoing funding disbursements. In addition, Cyclone Harold in March and the subsequent State of Emergencies implemented for both Cyclone Harold and the COVID-19 pandemic, have impacted on the ability of the team to progress further with the implementation of this activity. However, in readiness for the project becoming fully effective, the team has continued to work on defining equipment specifications for the automatic river monitoring gauges. The specifications have been endorsed by the Director of DoWR and VMGD.

The sector team has been undertaking consultations to gather and process the required approvals through 'prior consent forms' for the river monitoring gauges for the Sarakata River. These are to be in place prior to procurement of the equipment.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Procurement and installation of equipment to commence the data collection linked to the development of the Flood Management Plan (Activity 2.1.4).

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.1: Upgrading and expanding the Vanuatu observational networks; Sub-Activity 1.2.1.2. Ocean monitoring for CLEWS enhancement and inundation modelling

Status

Activity started - progress delayed

Implementation Progress

13 %

Progress for the relevant reporting period

The assessment findings recommended the installation of at least two ocean buoys with radio receiving equipment inside selected fisheries locations of the Fisheries Case Study. Discussions with suppliers of the equipment have taken place to ascertain an understanding of the technologies which are available and their capability, including how the equipment might complement VMGD. The decision was made to procure six compact SOFAR Spotter Buoys which will provide the same data requirements needed for climate and ocean modelling, in contrast to the larger more expensive buoys initially proposed. The recommended equipment is also more suitable for the capabilities of VMGD and Vanuatu Fisheries Departments. The new ocean observation data streamed from the new instruments will inform the further re-development of the Vanuatu Oceans Outlook bulletin (refer below).

The sites include (a) Naone on Maewo island; (b) Toman on Malekula island; (c) Votlo on Epi island and (d) Port Resolution on Tanna island. The installation of the ocean monitoring equipment will collect data to show influences of climate and ocean changes to fisheries resources. The activity will also contribute to sub-activity 1.2.5.2 Undertaking preliminary climate hotspotting for coastal areas eg coral bleaching and more. The four sites were selected based on thermal histories and climate projections by Maynard et al (2018) report.

The consultations undertaken with local fisheries communities in the selected site above, show great interest in the establishment of marine protected areas (MPAs) (either customary local tabu areas or formal CCAs) as a mechanism for protecting fisheries habitats and fish populations to support recruitment of fish stocks in adjacent areas that are impacted by marine heatwaves and coral bleaching. To monitor the health of the reef ecosystem, fish catch data will be collected using an e-monitoring toolkit.

In addition to the procurement of the ocean monitoring equipment, excellent progress has been made with the development of the Vanuatu Ocean Outlook Bulletin which has a special focus on fisheries, ocean monitoring, sea levels, coral reefs, shipping and ocean ENSO. The bulletin provides the user with localised information on:

• ocean and tide information,
• current and projections on sea surface temperatures (SST),
• sea level outlook,
• coral reef stress (coral bleaching alerts),
• monthly chlorophyll and
• convergence zone location.

The bulletin also provides information on moon phases that links to fisheries activities and seasonal rising of certain fish species. The ocean bulletin uses information from the Pacific Ocean Portal http://oceanportal.spc.int/portal/ocean.html and has been in the pipeline for a number of years now. The climatologists within the Climate Division are responsible for the compilation and release of this product on a monthly basis. This is disseminated alongside other VMGD CIS products such as the VCU as a package and it is received by more than 500 people on email, 1000 people on Facebook and about 500 online via the VMGD website.

The continued activities for this will link up with Activity 1.2.2.1 (not started yet) and will further review the content, communication but also the application and usage of the information for decision making. Decision support tools will also be developed on the sector side to receive, process and convert information into early warning and early action.

The lastest ocean outlook is found at this URL link:
https://www.vmgd.gov.vu/vmgd/images/climate-media/docs/Vanuatu_Ocean_Outlook/Vanuatu_Ocean_Outlook_July_2020.pdf

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Procurement and installation of equipment.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.1: Upgrading and expanding the Vanuatu observational networks; Sub-Activity 1.2.1.3. Expanding Vanuatu's rainfall monitoring system

Status

Activity started - progress delayed

Implementation Progress

13 %

Progress for the relevant reporting period

This activity has started with the land survey, assessment of physical locations for the installation of new automatic weather systems (AWS x 8), automatic rainfall gauges (ARGs x 8) in all six provinces of Vanuatu in late 2019. The VMGD engineers and instrument technicians grouped into three assessment teams and ventured out to different regions to meet reporting timelines. The main objective of the assessment was to confirm availability of land for the installations of the new equipment as well as conducting community consultations with local stakeholders eg village chiefs, area administrators, community rainfall observers and more. A criteria for the selection of sites was developed to guide the assessment team.

This includes and was not limited to the following criteria details:

1. Site to be on government land (or lease) and there are no land ownership challenges/issues on its accessibility and use.
2. Utilise Government existing centers or sites e.g. GPS sites belonging to the Land Survey Department
3. Collate new data from 'black observation holes' to support sector case studies
4. Must complement existing network coverage and expand data streams from new locations; not to duplicate data collected from nearby observations sites
5. To revive a 'silent' station recommended by VMGD as a 'hotspot' and to extend climate data series, weather forecasting priority area e.g. airports and sector relevant sites e.g. coffee plantations, etc.
6. To upgrade an existing 'manual observation site' into automatic status
7. Site to generate new data streams to assist in the verification of climate prediction models and seasonal forecasts
8. Site selected in accordance with Van-KIRAP Environmental Social Safeguards Management Plan (EMSP), and it will not have any detrimental environmental implications and social harm
9. At least one site located in each of the 6 provinces
10. Site within priority water catchment area in Vanuatu and support hydrological assessment for PWD and DoWR
11. Site to complement existing and new AWS site - expand rainfall observations site
12. Upgrade an existing manual 'Vanuatu Rainfall Network' site that is manned by a community volunteer. Automate the data capture and communication processes.

The result of the site assessments show that the following sites are suitable for the installation of the new AWS and ARGs. The teams were also able to obtain signatures of local land owners indicating their support for the activity. The following sites have been recommended by the VMGD for this activity.

Auto raingauge (ARG) site Province
1. Brenwe river, Malekula Malampa Province
2. North Tanna Tafea Province
3. Tegua, Torres Islands Torba Province
4. Vunasbev, South East Santo Sanma Province
5. Ipota Airport, Erromango Tafea Province
6. Talise Maewo (hydro) Penama Province
7. Aniwa, (area council) Tafea Province
8. Sarakata river Sanma Province

The Brenwe river, Malekula island, Sarakata, Santo island and Talise, Maewo island ARG sites will provide new data on the climate of the region, augment existing gaps in the VMGD rainfall observations network and well as to support the nearest hydropower station operations in Malekula by providing near-real time data and statistics for planning and management of water supply. It also supports the activities in the Agriculture case study on food security and agromet research.

The aim at each site is as follows:

* The North Tanna, Tanna island and Aniwa island ARG will replace and extend an existing rainfall site currently operating as a manual observations site. This improves the frequency in which rainfall data will be collected and therefore the resolution of the data improves.
* The Tegue, Torres Island ARG is a key location for monitoring climate and rainfall regimes.
* The Vunasbev ARG will generate new data to support the Water sector case study and development in general in the Sarakata but also improve the resolution and frequency of rainfall data in the area.
* Ipota Airport ARG in Erromango will provide new rainfall data that will enhance the understanding of Vanuatu’s seasonal rainfall variability. The location sits within an improving agriculture region. Data from this ARG will also assist in the day to day management of airport operation in Erromango.

The assessment findings confirms that the following locations meet the criteria for the installation of the AWS

AWS Sites Province
1. Loh Torba Province
2. Loltong, Pentecost Penama Province
3. Lambubu, West Malekula Malampa Province
4. Olal, North Amryum Malampa Province
5. Rovoliu, NW Epi Shefa Province
6. Dillons Bay, West Erromango Tafea Province

7. North Tanna Tafea Province
8. VARTC, Luganville, Santo Sanma Province
9. Lajmoli Airport Sanma Province

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Finalise land agreements with assistance of Department of Lands, Department of Local Affairs.
Milestone #2: Procurement of and supply of the ARGs
Milestone #3: Installation and commissioning of the ARGs

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.1: Upgrading and expanding the Vanuatu observational networks; Sub-Activity 1.2.1.4. Expanding Vanuatu's EWS capability

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

This activity includes the procurement and installation of a weather radar system subject to submission of a Cost-benefit Analysis (CBA). The CBA is a disbursement condition linked to the third disbursement as per the FAA. The activity is on track.

In March, a consultancy agreement was awarded to the New Zealand-based, National Institute of Water and Atmospheric Research (NIWA) to conduct the CBA with focus on (a) Comparison of weather radar systems currently available on the market (i.e. S-band, C-band and X-band etc) and their capability; (b) Assessment of the technical, financial capacity of the Vanuatu Meteorology and Geohazards Department in the sustainability aspect of the weather radar system and (c) Detailed report on the proposed revenue streams that the weather radar system can contribute to and support the maintenance and upkeep of the equipment.

The NIWA consultants were not able to travel to Vanuatu to meet national stakeholders face to face and collect data/reports to inform the CBA due to travel restrictions imposed by the COVID-19 state of emergency. The PMU carried out the consultation instead and was a key priority from March to June period. More than 20 agencies were surveyed including the main target sectors users namely (a). Agriculture; (b). Fisheries; (c). Infrastructure; (d). Tourism and (e). Water. In excess of 50 VMGD and sector reports and publications were collated online and sourced locally and handed over to NIWA to complete the assessment. The assignment to collect data was an enormous and difficult task; as the information required was sparce, inaccessible and not systematically stored on government portals eg NAB; Government websites or INFORM Environmental Portals. Weekly online meetings were conducted between NIWA and the PMU to stocktake and progress the CBA in accordance to the desired timelines.

The CBA was submitted in July 2020 and approved by the Green Climate Fund, however, additional caveats for final approval are to be met before any procurement is undertaken.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Preparation of report on existing infrastructure support for radar
Executing Entity is to prepare a report for submission to IA outlining existing infrastructure and necessary platforms for the installation of the radar. The report is to provide details of timelines if infrastructure and platforms are to be put in place, and evidence of budgetary appropriations in which these will be funded through. Depending on the results of the report, a decision will then be made to move to the next step of the process which is the obtainment of five quotes for the C-Band radar.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.2: Improved utility and function of seasonal climate forecasts; Sub-activity 1.2.2.1. Develop new seasonal impact forecasts for priority sectors

Status

Activity not yet due

Implementation Progress

20 %

Progress for the relevant reporting period

Seasonal forecasts will require the updated climate data records to integrate with the seasonal forecast and provide localised information thus this activity is dependent on the delivery of Activity 1.1.1.

User requirements from previous Van-KIRAP workshops identified user requirements which have been followed up as part of starting up this sub-activity, namely VMGD identifying the need for average rainfall and temperature gridded maps. As part of providing VMGD with S2S climate products from ACCESS-S (dynamical climate model) for the development of new impact based forecasts, the BOM have included gridded rainfall and temperature products as part of re-designed WMO GPC LRFs Portal. S2S maps of rainfall and temperature are now available to VMGD at global, regional and national levels.

Current project delays, provide some opportunities to possibly integrate new modelling developments and data options such as reanalysis data including Bureau of Meteorology Atmospheric high-resolution Regional Reanalysis for Australia (BARRA) which include Vanuatu in it's domain. This dataset is being considered as part of the data and model sourcing.

Future work will include sourcing user requirements from the five priority sectors and aligning them to the capabilities to progress the prototyping and development of new impact based forecasts.

Note: Seasonal forecasts will require the updated climate data records to integrate with the seasonal forecast and provide localised information thus this activity is dependent on the delivery of Activity 1.1.1.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Data collection: ACCESS-S seasonal forecasts, high quality station datasets
Milestone #2: Sourcing user requirements from the five priority sectors and aligning them to the capabilities to progress the prototyping and development of new impact based forecasts.
Milestone #3: Downscaling of rainfall and temperatures seasonal forecasts (i.e. temperature can encompass mean or min or max)
Milestone #4: Integrating new downscaled seasonal forecasts with sector-needs to develop new impact seasonal forecasts

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.2: Improved utility and function of seasonal climate forecasts; Sub-activity 1.2.2.2. New downscaled datasets developed and interfaced with sector-defined CIS

Status

Activity not yet due

Implementation Progress

10 %

Progress for the relevant reporting period

Initial scoping of sector specific requirements has been planned, initially through feedback provided during review workshops and by collaborating with delivery partners who began sector specific in-country workshops. Requirements based on previous project work done in partnership between COSPPac and Vanuatu sector has also been used to inform project sub activity scoping.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Future steps will include more detailed requirements around sector needs. These will be combined with aligned activities (such as impact based forecast and traditional knowledge where relevant) to leverage learnings and reduce meetings for in-country sectors and users. This work will help to progress development while waiting for climate data sets to be updated which will be integral to developing downscaled datasets by integrating seasonal model forecasts with 1.1.1.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.3: Long-term projections for key climate variables and climate extremes for Vanuatu; Sub-activity 1.2.3.1. Developing multi-model projections for key climate variables in Vanuatu

Status

Activity started - progress on track

Implementation Progress

15 %

Progress for the relevant reporting period

The collective scope of work for sub-activities 1.2.3.1, 1.2.3.2, 1.2.3.3 and 1.2.3.4, has been consolidated into an integrated body of work around planning, design and production to deliver an interim suite of CIS deliverables across all sub-activities. In this context it should be noted that there is a high level of inter-dependency between the technical specifications of these sub-activities at this early stage of the project. Consolidated progress across the four relevant sub-activities is reported here accordingly.

Results from the initial six-months work were presented in February 2020 at the Santo Workshop and included results of analyses which were undertaken following the feedback from VMGD, SPREP PMU and Sectors in the 1st Technical Engagement Workshop in September 2019, in Port Vila and in the Virtual Workshop in December 2019. Ideas and examples on how VMGD and sectors could use the results were also demonstrated and discussed.

The results include:

1. User needs identified: Projections information which are required by VMGD and Sectors are: national projections for air temperature and rainfall (the mean, ex-treme or threshold), drought projections, and tropical cyclone for 2030, 2050, 2070 and 2090.
2. Analyses of historical temperature and rainfall for the whole Vanuatu and for six climate stations, to provide context for the long-term projections. The results show positive trends in the mean air temperature and no clear trends in annual rainfall in Vanuatu since mid 20th Century. The annual rainfall is highly variable.
3. Analyses of modelled temperature for the whole Vanuatu from 1900 to the fu-ture. The results show that observed temperature positive trend to date is con-sistent with the projection, suggesting the projection is a good guide to what is happening, noting that the natural variability (dips and peaks) from year to year are expected. The average of all models for Vanuatu suggest the average temperature for 2020-2040 will be warmer than the 1986-2005) baseline.
4. Projections for drought: The results indicate that extreme drought frequency will stay the same up to 2050 and become more frequent after that.
5. Proof of concept for developing and presenting projections for tropical cyclone re-lated wind speed and extreme rainfall.
6. Evaluation of global gridded data against station data, as a context for devel-oping future climate datasets. It was found that global gridded data (WorldClim and Princeton) temporal pattern are the same with those of station data even though the value could slightly differ. On this basis and on the non-existence of Vanuatu gridded data set, this study used the WorldClim data for developing future climatol-ogy data set for Vanuatu.
7. Historical and future climatology datasets for temperature and rainfall. This in-cludes gridded data set for Vanuatu and tabular data set for seven stations across Vanuatu.
8. Examples of potential use of projection information for assessing impact of projected rainfall and temperature on climate-suitability for Kava, coffee and dry land taro. Potential use for assessing future flow and/or soil erosion for Sarakata river, if data and modelling capability available, were also demonstrated.

The Santo workshop evolved around a series of questions to ascertain needs and requirements from stakeholders, and develop an understanding of climate projections. The initial question on “why do we need climate projections?” stimulated thinking around how VMGD or Sectors might benefit from the information developed through the project. For example, a water sector representative replied, “climate projections are needed to do long-term planning”, while the agriculture sector personnel mentioned the information is useful for exploring adaptation e.g. finding plants which are more tolerant to higher temperatures and wetter conditions.

The group discussed “how were climate projections developed?” using an analogue of how population projections are usually developed. This was to raise awareness about various factors affecting projections. Future condition will depend on how these factors are going and hence there is some level of uncertainty in any type of projections (be it population projections or climate projections). The users need to be aware and need to include all the range of uncertainties when they plan to use climate projections developed from this project. Users also need to consider projections of other variables (e.g. population projections).

Stakeholders were provided with examples of results described in a form of data sets that can be used for subsequent analyses. For example, monthly rainfall data for Pekoa station, for present and future. Also shown were results presented in figures such as the near future and long-term projections of temperature for Vanuatu as a whole. Not only was this was to gauge users’ understanding about the results but also to gain feedback on how results could be presented in simple and effective ways. These learnings are crucial in guiding the subsequent research design and work plan to be conducted in the next three years.

Finally examples were shown on how the projection information could be used for the agriculture sector (i.e. to estimate impacts on climate suitability for Kava, dry land Taro and Arabica coffee, identified in the 1st Technical Workshop), for all sectors (e.g. tropical cyclone induced wind speed and extreme rainfall as well as drought), for water and tourism sectors (e.g. estimate of low and high flow for Sarakata river, soil erosion over the river catchments which are important to water supply and/or the “blue lagoon” location).

The workshop was well received with feedback received to strengthen the design including:
• The communication for long-term projections needs to target policymakers. This differs to the monthly bulletin which requires short-term forecasts.
• The drought projections could be shown in maps for Tourism operators, in print or in the Portal. Drought definition needs to be aligned with VMGD’s definition.
• If possible, rainfall projection analyses for drought and heavy rainfall be conducted for three main regions of Vanuatu (north to south).
• The Agro-Met bulletin would like to include the projections for temperature, drought, water level, and rainfall as well as climate suitability for coffee, kava and cocoa.
• The water department’s current priority is water supply – not river water level. If the required data and hydrological model are available, the

project could assess the impact of climate projections on water supply. The analyses could also link wa-ter levels to energy power for Luganville in the longer term (next 50 years).
• Dam designs need to be economically viable. The projected changes in drought duration might be useful for assessing potential economical impact.
• Projections on human comfort (wet bulb temperature) could be useful for the Tourism sector
• The projections information could be included as part of reviewing provincial plan-ning for tourism.

The two-way discussion between the researchers and the users as well as among users in the workshop facilitated social learning, including improved understanding of all dimensions of the project. The feedback received will be taken into account in the next phase of project implementation.

During the second half of the year, the activity was halted due to funding delays, however, it recommenced in the latter part of the year with the following undertaken:

• User experience feedback received in the Luganville workshop in February 2020 was collated and considered into the subsequent analyses.

• Collaboration with the Pacific NextGen Projections Project (funded by the Australian Government through the Australia Pacific Climate Partnership/APCP) to analyse and prepare updated national projections for rainfall and temperature for Vanuatu has started. The NextGen Project is undertaking the work for 14 countries across the Pacific region. This collaboration is important to ensure consistency in methodology and results with other partner Pacific Island countries.

• Preliminary tropical cyclone synthetic track simulations have been generated. These simulations were conducted using the NCEP2 reanalysis data from 1979-2020. Example of the 50 strongest synthetic Tropical Cyclones passing within 200 km of Port Vila, the largest city of Vanuatu located in the island of Efate.

• Modelling design and methodology for projections for extreme rainfall and extreme temperature have been developed, by considering user feedback received at the provincial workshop in Santo in February 2020. The Activity team aims to develop projections for the return value (e.g. 1 in 20 years event) for selected extremes variables, i.e:

• Annual hottest, annual lowest
• TXx = monthly maximum value of daily maximum temperature
• TNn = monthly minimum value of daily minimum temperature
• RX1day = maximum one-day precipitation (highest pr amount in one-day period)

• Ongoing support to sector coordinators in developing case studies has been provided e.g. detailed inputs and feedback to the latest draft of each sector's case study plan.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Note: These milestones also relate to Sub-Activities 1.2.3.2, 1.2.3.3 and 1.2.3.4

Milestone #1: Engage and outreach to target Next/End-Users (i.e. VMGD and the five sectors) to communicate and gain feedbacks on the preliminary results.
Milestone #2: Refine analyses for developing projections as necessary. This will include the development of preliminary knowledge products to be integrated into CIS and on-going consultation with VMGD and the sectors to ensure relevance and practical usefulness of the outputs from this Activity.
Milestone #3: Contribute to the VMGD's delivery for the outreach and associated training (i.e. Delivery of targeted training and on-the-job support for application of CIS) as needed.
Milestone #4: Conduct analysis, as per modelling design defined in 5.5.1b, to develop tailored application-ready climate change data sets for each of the selected variables.
Milestone #5: provide climate change data sets and support Next/End-Users (i.e. VMGD and the five sectors) for demonstrating the use of climate change data sets in a climate change impacts/vulnerability/risks assessment as part of the sector-base case study as necessary, subject to the focus/scope/scale of the sector-base case study.
Milestone #6: Consider users feedback and refine analyses for developing tailored projections data sets as necessary to ensure relevance and practical usefulness of the outputs from this Activity.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

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Project Activity Name

Activity 1.2.3: Long-term projections for key climate variables and climate extremes for Vanuatu; Sub-activity 1.2.3.2. Downscaled projections ground-truthed and outreach to target next/end users

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

The collective scope of work for sub-activities 1.2.3.1, 1.2.3.2, 1.2.3.3 and 1.2.3.4, has been consolidated into an integrated body of work around planning, design and production to deliver an interim suite of CIS deliverables across all sub-activities. In this context it should be noted that there is a high level of inter-dependency between the technical specifications of these sub-activities at this early stage of the project. Consolidated progress across the four relevant sub-activities is reported here accordingly.

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Key milestones and deliverables for the next reporting period

Note: These milestones also relate to Sub-Activities 1.2.3.2, 1.2.3.3 and 1.2.3.4

Milestone #1: Engage and outreach to target Next/End-Users (i.e. VMGD and the five sectors) to communicate and gain feedbacks on the preliminary results.
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Milestone #6: Consider users feedback and refine analyses for developing tailored projections data sets as necessary to ensure relevance and practical usefulness of the outputs from this Activity.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.3: Long-term projections for key climate variables and climate extremes for Vanuatu; Sub-activity 1.2.3.3. Apply Global Climate Model projections to observed datasets

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

The collective scope of work for sub-activities 1.2.3.1, 1.2.3.2, 1.2.3.3 and 1.2.3.4, has been consolidated into an integrated body of work around planning, design and production to deliver an interim suite of CIS deliverables across all sub-activities. In this context it should be noted that there is a high level of inter-dependency between the technical specifications of these sub-activities at this early stage of the project. Consolidated progress across the four relevant sub-activities is reported here accordingly.

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4. Projections for drought: The results indicate that extreme drought frequency will stay the same up to 2050 and become more frequent after that.
5. Proof of concept for developing and presenting projections for tropical cyclone re-lated wind speed and extreme rainfall.
6. Evaluation of global gridded data against station data, as a context for devel-oping future climate datasets. It was found that global gridded data (WorldClim and Princeton) temporal pattern are the same with those of station data even though the value could slightly differ. On this basis and on the non-existence of Vanuatu gridded data set, this study used the WorldClim data for developing future climatol-ogy data set for Vanuatu.
7. Historical and future climatology datasets for temperature and rainfall. This in-cludes gridded data set for Vanuatu and tabular data set for seven stations across Vanuatu.
8. Examples of potential use of projection information for assessing impact of projected rainfall and temperature on climate-suitability for Kava, coffee and dry land taro. Potential use for assessing future flow and/or soil erosion for Sarakata river, if data and modelling capability available, were also demonstrated.

The Santo workshop evolved around a series of questions to ascertain needs and requirements from stakeholders, and develop an understanding of climate projections. The initial question on “why do we need climate projections?” stimulated thinking around how VMGD or Sectors might benefit from the information developed through the project. For example, a water sector representative replied, “climate projections are needed to do long-term planning”, while the agriculture sector personnel mentioned the information is useful for exploring adaptation e.g. finding plants which are more tolerant to higher temperatures and wetter conditions.

The group discussed “how were climate projections developed?” using an analogue of how population projections are usually developed. This was to raise awareness about various factors affecting projections. Future condition will depend on how these factors are going and hence there is some level of uncertainty in any type of projections (be it population projections or climate projections). The users need to be aware and need to include all the range of uncertainties when they plan to use climate projections developed from this project. Users also need to consider projections of other variables (e.g. population projections).

Stakeholders were provided with examples of results described in a form of data sets that can be used for subsequent analyses. For example, monthly rainfall data for Pekoa station, for present and future. Also shown were results presented in figures such as the near future and long-term projections of temperature for Vanuatu as a whole. Not only was this was to gauge users’ understanding about the results but also to gain feedback on how results could be presented in simple and effective ways. These learnings are crucial in guiding the subsequent research design and work plan to be conducted in the next three years.

Finally examples were shown on how the projection information could be used for the agriculture sector (i.e. to estimate impacts on climate suitability for Kava, dry land Taro and Arabica coffee, identified in the 1st Technical Workshop), for all sectors (e.g. tropical cyclone induced wind speed and extreme rainfall as well as drought), for water and tourism sectors (e.g. estimate of low and high flow for Sarakata river, soil erosion over the river catchments which are important to water supply and/or the “blue lagoon” location).

The workshop was well received with feedback received to strengthen the design including:
• The communication for long-term projections needs to target policymakers. This differs to the monthly bulletin which requires short-term forecasts.
• The drought projections could be shown in maps for Tourism operators, in print or in the Portal. Drought definition needs to be aligned with VMGD’s definition.
• If possible, rainfall projection analyses for drought and heavy rainfall be conducted for three main regions of Vanuatu (north to south).
• The Agro-Met bulletin would like to include the projections for temperature, drought, water level, and rainfall as well as climate suitability for coffee, kava and cocoa.
• The water department’s current priority is water supply – not river water level. If the required data and hydrological model are available, the

project could assess the impact of climate projections on water supply. The analyses could also link wa-ter levels to energy power for Luganville in the longer term (next 50 years).
• Dam designs need to be economically viable. The projected changes in drought duration might be useful for assessing potential economical impact.
• Projections on human comfort (wet bulb temperature) could be useful for the Tourism sector
• The projections information could be included as part of reviewing provincial plan-ning for tourism.

The two-way discussion between the researchers and the users as well as among users in the workshop facilitated social learning, including improved understanding of all dimensions of the project. The feedback received will be taken into account in the next phase of project implementation.

During the second half of the year, the activity was halted due to funding delays, however, it recommenced in the latter part of the year with the following undertaken:

• User experience feedback received in the Luganville workshop in February 2020 was collated and considered into the subsequent analyses.

• Collaboration with the Pacific NextGen Projections Project (funded by the Australian Government through the Australia Pacific Climate Partnership/APCP) to analyse and prepare updated national projections for rainfall and temperature for Vanuatu has started. The NextGen Project is undertaking the work for 14 countries across the Pacific region. This collaboration is important to ensure consistency in methodology and results with other partner Pacific Island countries.

• Preliminary tropical cyclone synthetic track simulations have been generated. These simulations were conducted using the NCEP2 reanalysis data from 1979-2020. Example of the 50 strongest synthetic Tropical Cyclones passing within 200 km of Port Vila, the largest city of Vanuatu located in the island of Efate.

• Modelling design and methodology for projections for extreme rainfall and extreme temperature have been developed, by considering user feedback received at the provincial workshop in Santo in February 2020. The Activity team aims to develop projections for the return value (e.g. 1 in 20 years event) for selected extremes variables, i.e:

• Annual hottest, annual lowest
• TXx = monthly maximum value of daily maximum temperature
• TNn = monthly minimum value of daily minimum temperature
• RX1day = maximum one-day precipitation (highest pr amount in one-day period)

• Ongoing support to sector coordinators in developing case studies has been provided e.g. detailed inputs and feedback to the latest draft of each sector's case study plan.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Note: These milestones also relate to Sub-Activities 1.2.3.2, 1.2.3.3 and 1.2.3.4

Milestone #1: Engage and outreach to target Next/End-Users (i.e. VMGD and the five sectors) to communicate and gain feedbacks on the preliminary results.
Milestone #2: Refine analyses for developing projections as necessary. This will include the development of preliminary knowledge products to be integrated into CIS and on-going consultation with VMGD and the sectors to ensure relevance and practical usefulness of the outputs from this Activity.
Milestone #3: Contribute to the VMGD's delivery for the outreach and associated training (i.e. Delivery of targeted training and on-the-job support for application of CIS) as needed.
Milestone #4: Conduct analysis, as per modelling design defined in 5.5.1b, to develop tailored application-ready climate change data sets for each of the selected variables.
Milestone #5: provide climate change data sets and support Next/End-Users (i.e. VMGD and the five sectors) for demonstrating the use of climate change data sets in a climate change impacts/vulnerability/risks assessment as part of the sector-base case study as necessary, subject to the focus/scope/scale of the sector-base case study.
Milestone #6: Consider users feedback and refine analyses for developing tailored projections data sets as necessary to ensure relevance and practical usefulness of the outputs from this Activity.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.3: Long-term projections for key climate variables and climate extremes for Vanuatu; Sub-activity 1.2.3.4. Synthesis and report application-ready data in context of risk assessments for sectors, outreach to next / end users

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

The collective scope of work for sub-activities 1.2.3.1, 1.2.3.2, 1.2.3.3 and 1.2.3.4, has been consolidated into an integrated body of work around planning, design and production to deliver an interim suite of CIS deliverables across all sub-activities. In this context it should be noted that there is a high level of inter-dependency between the technical specifications of these sub-activities at this early stage of the project. Consolidated progress across the four relevant sub-activities is reported here accordingly.

Results from the initial six-months work were presented in February 2020 at the Santo Workshop and included results of analyses which were undertaken following the feedback from VMGD, SPREP PMU and Sectors in the 1st Technical Engagement Workshop in September 2019, in Port Vila and in the Virtual Workshop in December 2019. Ideas and examples on how VMGD and sectors could use the results were also demonstrated and discussed.

The results include:

1. User needs identified: Projections information which are required by VMGD and Sectors are: national projections for air temperature and rainfall (the mean, ex-treme or threshold), drought projections, and tropical cyclone for 2030, 2050, 2070 and 2090.
2. Analyses of historical temperature and rainfall for the whole Vanuatu and for six climate stations, to provide context for the long-term projections. The results show positive trends in the mean air temperature and no clear trends in annual rainfall in Vanuatu since mid 20th Century. The annual rainfall is highly variable.
3. Analyses of modelled temperature for the whole Vanuatu from 1900 to the fu-ture. The results show that observed temperature positive trend to date is con-sistent with the projection, suggesting the projection is a good guide to what is happening, noting that the natural variability (dips and peaks) from year to year are expected. The average of all models for Vanuatu suggest the average temperature for 2020-2040 will be warmer than the 1986-2005) baseline.
4. Projections for drought: The results indicate that extreme drought frequency will stay the same up to 2050 and become more frequent after that.
5. Proof of concept for developing and presenting projections for tropical cyclone re-lated wind speed and extreme rainfall.
6. Evaluation of global gridded data against station data, as a context for devel-oping future climate datasets. It was found that global gridded data (WorldClim and Princeton) temporal pattern are the same with those of station data even though the value could slightly differ. On this basis and on the non-existence of Vanuatu gridded data set, this study used the WorldClim data for developing future climatol-ogy data set for Vanuatu.
7. Historical and future climatology datasets for temperature and rainfall. This in-cludes gridded data set for Vanuatu and tabular data set for seven stations across Vanuatu.
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The Santo workshop evolved around a series of questions to ascertain needs and requirements from stakeholders, and develop an understanding of climate projections. The initial question on “why do we need climate projections?” stimulated thinking around how VMGD or Sectors might benefit from the information developed through the project. For example, a water sector representative replied, “climate projections are needed to do long-term planning”, while the agriculture sector personnel mentioned the information is useful for exploring adaptation e.g. finding plants which are more tolerant to higher temperatures and wetter conditions.

The group discussed “how were climate projections developed?” using an analogue of how population projections are usually developed. This was to raise awareness about various factors affecting projections. Future condition will depend on how these factors are going and hence there is some level of uncertainty in any type of projections (be it population projections or climate projections). The users need to be aware and need to include all the range of uncertainties when they plan to use climate projections developed from this project. Users also need to consider projections of other variables (e.g. population projections).

Stakeholders were provided with examples of results described in a form of data sets that can be used for subsequent analyses. For example, monthly rainfall data for Pekoa station, for present and future. Also shown were results presented in figures such as the near future and long-term projections of temperature for Vanuatu as a whole. Not only was this was to gauge users’ understanding about the results but also to gain feedback on how results could be presented in simple and effective ways. These learnings are crucial in guiding the subsequent research design and work plan to be conducted in the next three years.

Finally examples were shown on how the projection information could be used for the agriculture sector (i.e. to estimate impacts on climate suitability for Kava, dry land Taro and Arabica coffee, identified in the 1st Technical Workshop), for all sectors (e.g. tropical cyclone induced wind speed and extreme rainfall as well as drought), for water and tourism sectors (e.g. estimate of low and high flow for Sarakata river, soil erosion over the river catchments which are important to water supply and/or the “blue lagoon” location).

The workshop was well received with feedback received to strengthen the design including:
• The communication for long-term projections needs to target policymakers. This differs to the monthly bulletin which requires short-term forecasts.
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The two-way discussion between the researchers and the users as well as among users in the workshop facilitated social learning, including improved understanding of all dimensions of the project. The feedback received will be taken into account in the next phase of project implementation.

During the second half of the year, the activity was halted due to funding delays, however, it recommenced in the latter part of the year with the following undertaken:

• User experience feedback received in the Luganville workshop in February 2020 was collated and considered into the subsequent analyses.

• Collaboration with the Pacific NextGen Projections Project (funded by the Australian Government through the Australia Pacific Climate Partnership/APCP) to analyse and prepare updated national projections for rainfall and temperature for Vanuatu has started. The NextGen Project is undertaking the work for 14 countries across the Pacific region. This collaboration is important to ensure consistency in methodology and results with other partner Pacific Island countries.

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• RX1day = maximum one-day precipitation (highest pr amount in one-day period)

• Ongoing support to sector coordinators in developing case studies has been provided e.g. detailed inputs and feedback to the latest draft of each sector's case study plan.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Note: These milestones also relate to Sub-Activities 1.2.3.2, 1.2.3.3 and 1.2.3.4

Milestone #1: Engage and outreach to target Next/End-Users (i.e. VMGD and the five sectors) to communicate and gain feedbacks on the preliminary results.
Milestone #2: Refine analyses for developing projections as necessary. This will include the development of preliminary knowledge products to be integrated into CIS and on-going consultation with VMGD and the sectors to ensure relevance and practical usefulness of the outputs from this Activity.
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Milestone #5: provide climate change data sets and support Next/End-Users (i.e. VMGD and the five sectors) for demonstrating the use of climate change data sets in a climate change impacts/vulnerability/risks assessment as part of the sector-base case study as necessary, subject to the focus/scope/scale of the sector-base case study.
Milestone #6: Consider users feedback and refine analyses for developing tailored projections data sets as necessary to ensure relevance and practical usefulness of the outputs from this Activity.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.4: Risk-based coastal and other climate hazard analysis and mapping; Sub-activity 1.2.4.1. Mapping climate hazard 'hotspot' exposure

Status

Activity started - progress delayed

Implementation Progress

15 %

Progress for the relevant reporting period

The collective scope of work for sub-activities 1.2.4.1 and 1.2.4.2 has been consolidated into an integrated body of work around planning, design and production to deliver an interim suite of CIS deliverables across all sub-activities for purposes of the interim six-month work plan. In this context it should be noted that there is a high level of inter-dependency between the technical specifications of these sub-activities at this early stage of the project. Consolidated progress across the two relevant sub-activities is reported here accordingly.

Results from the six-months work presented at the February 2020 Workshop in Santo included results of design and preliminary analyses which were undertaken following the feedback from VMGD, SPREP PMU and sectors in the 1st Technical Engagement Workshop in September 2019, in Port Vila and in the Virtual Workshop in December 2019. Ideas and examples on how VMGD and sectors could use the results were also demonstrated and discussed.

The overall goals of the CSIRO-led sea level rise and coastal hazards activity is to provide:

• updated sea level rise scenarios, ultimately CMIP6-derived;
• detailed wave climate information; and
• coastal extreme water levels calculator combining sea level, waves and tides.

These will be delivered at national level, and include a baseline (current climate) scenario and a number of future scenarios. Also, targeted inundation and erosion hazard analyses, using high-resolution numerical modelling, will be undertaken at targeted study sites.
To support these overall goals, the following have been completed to support the project:
• National scale baseline wave climate analysis, using the CSIRO/Australian Bureau of Meteorology Wave Hindcast (1980-2020);
• Analysis of national scale CMIP5-based sea level rise projections;
• Preliminary analysis of national scale tides (TPXOv9) and historical sea level variability (ECMWF ORAS4);
• Extreme sea level baseline (current climate) calculator for a number of locations just offshore from east coast Espiritu Santo and Port Vila; and
• Development of preliminary unstructured mesh numerical modelling grid for the east coast of Espiritu Santo, to support high-resolution numerical modelling for both Activity 1.2.4 and 1.2.5.

In the second half of the year, the activity was halted due to delays in the funding disbursements. With the recommencement of the activity in November, a priority has been towards fulfilling underlying data requirements to inform and verify both national-level and targeted study site coastal hazard modelling (sub-activities 1.2.4.1 and 1.2.4.2, respectively). Progress has included:

• Identifying and working with a supplier for 10m spatial resolution satellite-derived bathymetry and related merged bathymetric data for all of Vanuatu. These datasets are required to underpin both sub-activities as well as Activity 1.2.5 and are a national-level Van KIRAP deliverable in its own right. This work has been commissioned to ensure the data products are fit-for-purpose and are scheduled for delivery in March 2021.

• As part of the coordination/working group for Van-KIRAP-related ocean instrumentation, activity team members have worked towards finalising the selection and budgeting of ocean instruments to be purchased through Van-KIRAP. These instruments will play an important role towards model calibration and verification of the coastal hazard modelling and analysis outputs that will inform the CIS products.

• Additionally, extraction and analysis of global climate model (GCM) derived changes to extreme wind-wave heights, from the Coordinated Ocean Wave Climate Project (COWCLIP), has been initiated, in preparation for future hazard modelling and analysis.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Preliminary extreme sea-level projection datasets developed, including methods to incorporate tropical cyclone track, intensity and frequency data, modified as appropriate, and reported
Milestone #2: Methods for modeling inundation at coastal risk “hot spot” locations using extreme sea-level projections, topography/bathymetry and in situ wave/sea level observations developed and reported
Milestone #3: Support training, outreach and sector-based case study provided as appropriate
Milestone #4: Approach for incorporating sea level extremes/coastal hazards data as CIS into the Vanuatu Climate Futures Portal defined

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.4: Risk-based coastal and other climate hazard analysis and mapping; Sub-activity 1.2.4.2. Developing projected extreme sea level probabilities for designated coastal 'hotspots'

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

Note: These milestones also relate to Sub-Activities 1.2.3.2, 1.2.3.3 and 1.2.3.4

Milestone #1: Engage and outreach to target Next/End-Users (i.e. VMGD and the five sectors) to communicate and gain feedbacks on the preliminary results.
Milestone #2: Refine analyses for developing projections as necessary. This will include the development of preliminary knowledge products to be integrated into CIS and on-going consultation with VMGD and the sectors to ensure relevance and practical usefulness of the outputs from this Activity.
Milestone #3: Contribute to the VMGD's delivery for the outreach and associated training (i.e. Delivery of targeted training and on-the-job support for application of CIS) as needed.
Milestone #4: Conduct analysis, as per modelling design defined in 5.5.1b, to develop tailored application-ready climate change data sets for each of the selected variables.
Milestone #5: provide climate change data sets and support Next/End-Users (i.e. VMGD and the five sectors) for demonstrating the use of climate change data sets in a climate change impacts/vulnerability/risks assessment as part of the sector-base case study as necessary, subject to the focus/scope/scale of the sector-base case study.
Milestone #6: Consider users feedback and refine analyses for developing tailored projections data sets as necessary to ensure relevance and practical usefulness of the outputs from this Activity.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Refer to the milestones outlined in Sub-Activity 1.2.4.1.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.5: Vulnerability mapping of the coastal zone in Vanuatu; Activity 1.2.5.1. Develop biogeochemical and hydrodynamic model for coastal areas of Vanuatu

Status

Activity started - progress delayed

Implementation Progress

15 %

Progress for the relevant reporting period

The collective scope of work for Sub-activities 1.2.5.1 and 1.2.5.2 has been consolidated into an integrated body of work around planning, design and production to deliver an interim suite of CIS deliverables across all sub-activities for purposes of the interim six-month work plan. In this context it should be noted that there is a high level of inter-dependency between the technical specifications of these sub-activities at this early stage of the project. Consolidated progress across the two relevant sub-activities is reported here accordingly.

Results from the six-months work presented at the February 2020 Workshop in Santo included results of design and preliminary analyses which were undertaken following the feedback from VMGD, SPREP PMU and sectors in the 1st Technical Engagement Workshop in September 2019, in Port Vila and in the Virtual Workshop in December 2019. Ideas and examples on how VMGD and sectors could use the results were also demonstrated and discussed.

In summary this includes:
• An initial assessment of the projected changes from the 5th and 6th Coupled Model Intercomparison Project (CMIP) was completed for ocean acidification, sea surface temperature and other climate variables. While many of the CMIP6 modelling groups have yet to upload their model simulations, an initial assessment of the suitability of these and other important datasets against existing CMIP5 simulations was undertaken. One major difference between these projections is the sensitivity to climate between the models i.e. the change in surface air temperature per unit of change in atmospheric CO2 concentration. This means CMIP6 particularly under higher emissions scenarios, show a greater warming than models with similar CO2 levels in CMIP5, suggesting particularly under high emissions changes will be felt soon.

• It was found that while the results showed some improvement in the representation of large-scale climate, overall, there was not a marked increase in skill in CMIP6 over CMIP5. This means, unfortunately many of biases seen in CMIP5 remain in CMIP6 e.g. the location of the Warm Pool. This has implications for Vanuatu in terms of the interpretation of projected changes in variables such projecting rain-fall. Equally challenges remain around representing and simulating the individual is-lands of Vanuatu, as many of these are significantly smaller than the 1-degree x 1-degree resolution associated with CMIP. One major improvement in CMIP6 over CMIP5 is in the number of models that represent ocean chemistry, allowing a bet-ter estimate of the projected mean state and the variability associated with this.

• CSIRO have developed a conceptual modelling approach to enable the use of the CMIP projections at the island scale, where local bathymetry, dynamics and chem-istry communicate how climate change will be felt at the local (coastal) scale. This work leverages “state of the art” modelling work at CSIRO developed for the Great Barrier Reef. This involved the developed an unstructured grid, using COMPAS (https://research.csiro.au/cem/software/ems/hydro/unstructured-compas/) for the eastern side of Santo. This is very exciting and novel allowing CSIRO to increase resolution to represent key and important processes, while capturing the link be-tween the ocean and coast. This model would be improved with higher resolution better bathymetry and staged approaches of satellite and LIDAR would be ideal. There is also a need to bring together all existing in-situ historical data on ocean temperature, fish catch, ocean to test and validate the models. This work also highlights the need for ongoing and future observational data e.g. buoys, and the need to link to information from all the sectors.

During the July - December period the team has been developing, sourcing and refining the bathymetry at Santo ahead of commencing the pilot simulations for developing coral bleaching risk datasets and CIS product outputs with and for sectors. The team has also been exploring the best modelling framework to implement in other regions. This has included back-office work quantifying the computational requirements, digital architecture, post processing and model evaluation needs for providing the technical configuration for the proposed risk assessments and the generation of CIS product outputs for relevant sectors. To ensure the data is available for this assessment they have been working closely with VMGD around the procurement and deployment of instrumentation. This procurement is yet to be fully finalised due to the time taken to develop the portfolio of instrument needs and deployment plans to align with needs of the sectoral case studies and thereby to address the needs of multiple uses including sectors and VMGD.

The team have also undertaken further consultation with other domain experts in the field to ascertain what other relevant initiatives are underway in Australia and the Pacific that could potentially be leveraged through Van-KIRAP, particularly in relation to the development of projections-based tools for generating CIS products for informing adaptation planning to mitigate future climate risks from marine heatwaves; highly relevant to the fisheries and tourism sectors.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Develop pilot model simulations for Santo.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.5: Vulnerability mapping of the coastal zone in Vanuatu; Sub-activity 1.2.5.2. Develop ocean acidification and marine impact projection maps

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

The collective scope of work for Sub-activities 1.2.5.1 and 1.2.5.2 has been consolidated into an integrated body of work around planning, design and production to deliver an interim suite of CIS deliverables across all sub-activities for purposes of the interim six-month work plan. In this context it should be noted that there is a high level of inter-dependency between the technical specifications of these sub-activities at this early stage of the project. Consolidated progress across the two relevant sub-activities is reported here accordingly.

Results from the six-months work presented at the February 2020 Workshop in Santo included results of design and preliminary analyses which were undertaken following the feedback from VMGD, SPREP PMU and sectors in the 1st Technical Engagement Workshop in September 2019, in Port Vila and in the Virtual Workshop in December 2019. Ideas and examples on how VMGD and sectors could use the results were also demonstrated and discussed.

In summary this includes:
• An initial assessment of the projected changes from the 5th and 6th Coupled Model Intercomparison Project (CMIP) was completed for ocean acidification, sea surface temperature and other climate variables. While many of the CMIP6 modelling groups have yet to upload their model simulations, an initial assessment of the suitability of these and other important datasets against existing CMIP5 simulations was undertaken. One major difference between these projections is the sensitivity to climate between the models i.e. the change in surface air temperature per unit of change in atmospheric CO2 concentration. This means CMIP6 particularly under higher emissions scenarios, show a greater warming than models with similar CO2 levels in CMIP5, suggesting particularly under high emissions changes will be felt soon.

• It was found that while the results showed some improvement in the representation of large-scale climate, overall, there was not a marked increase in skill in CMIP6 over CMIP5. This means, unfortunately many of biases seen in CMIP5 remain in CMIP6 e.g. the location of the Warm Pool. This has implications for Vanuatu in terms of the interpretation of projected changes in variables such projecting rain-fall. Equally challenges remain around representing and simulating the individual is-lands of Vanuatu, as many of these are significantly smaller than the 1-degree x 1-degree resolution associated with CMIP. One major improvement in CMIP6 over CMIP5 is in the number of models that represent ocean chemistry, allowing a bet-ter estimate of the projected mean state and the variability associated with this.

• CSIRO have developed a conceptual modelling approach to enable the use of the CMIP projections at the island scale, where local bathymetry, dynamics and chem-istry communicate how climate change will be felt at the local (coastal) scale. This work leverages “state of the art” modelling work at CSIRO developed for the Great Barrier Reef. This involved the developed an unstructured grid, using COMPAS (https://research.csiro.au/cem/software/ems/hydro/unstructured-compas/) for the eastern side of Santo. This is very exciting and novel allowing CSIRO to increase resolution to represent key and important processes, while capturing the link be-tween the ocean and coast. This model would be improved with higher resolution better bathymetry and staged approaches of satellite and LIDAR would be ideal. There is also a need to bring together all existing in-situ historical data on ocean temperature, fish catch, ocean to test and validate the models. This work also highlights the need for ongoing and future observational data e.g. buoys, and the need to link to information from all the sectors.

During the July - December period the team has been developing, sourcing and refining the bathymetry at Santo ahead of commencing the pilot simulations for developing coral bleaching risk datasets and CIS product outputs with and for sectors. The team has also been exploring the best modelling framework to implement in other regions. This has included back-office work quantifying the computational requirements, digital architecture, post processing and model evaluation needs for providing the technical configuration for the proposed risk assessments and the generation of CIS product outputs for relevant sectors. To ensure the data is available for this assessment they have been working closely with VMGD around the procurement and deployment of instrumentation. This procurement is yet to be fully finalised due to the time taken to develop the portfolio of instrument needs and deployment plans to align with needs of the sectoral case studies and thereby to address the needs of multiple uses including sectors and VMGD.

The team have also undertaken further consultation with other domain experts in the field to ascertain what other relevant initiatives are underway in Australia and the Pacific that could potentially be leveraged through Van-KIRAP, particularly in relation to the development of projections-based tools for generating CIS products for informing adaptation planning to mitigate future climate risks from marine heatwaves; highly relevant to the fisheries and tourism sectors.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Develop pilot model simulations for Santo.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.6: Developing tailored Agro-met predictions for target cropping systems; Sub-activity 1.2.6.1. Develop Agro-met information portal including new on-line IT infrastructure and software (VaCSA prototype)

Status

Activity started - progress delayed

Implementation Progress

25 %

Progress for the relevant reporting period

VaCSA is the primary source for CIS for the Agriculture case study and the validation of VaCSA based on the case study is therefore critical. Development of a fully functional VaCSA operational system was temporarily placed on hold at the end of 2019, primarily due to GCF fund disbursement delays and uncertainty around the disbursement timeline. However, APCC has already made significant progress in developing the VaCSA prototype, which contains a well-structured database for real-time weather data from VMGD's eight Automatic Weather Stations (AWSs) and for agricultural data collected using the Crop Climate Diary (CCD) from field trial plots.

The VaCSA prototype can be accessed through the following temporary URL: http://vacsa.epinet.kr:9091/login.do, with the Crop Climate Diary (CCD) incorporated. Based on the initial analysis on the weather observation and forecast information flow and the database structure at VMGD, the VaCSA database currently has access to one of the VMGD databases for eight AWSs. It is now ready for new agro-met service contents to be added onto the VaCSA platform.

High-resolution climate data development procedures
As CIS for agriculture requires high resolution climate information to deal with farm scale decision making, APCC is developing high resolution, grided, climate observation data by merging satellite, observation, and reanalysis data though the state-of-the-art agromet data assimilation. The resulting historical data will be used to tailor the climate information resulting from the Van-KIRAP to the agromet information to support local-scale agricultural decision makings.

Pacific Island countries, including Vanuatu, face the threat of climate change. In particular, the agricultural sector is expected to suffer from a decrease in crop yield due to salinization of groundwater due to sea level rise and lack of agricultural water due to drought. To respond appropriately to this climate change situation, it is necessary to prepare long-term measures such as sustainable agriculture.

In Vanuatu, there were only six weather observation stations collecting climate data for the past 30 years. It is impossible to provide high-resolution agricultural climate information services across Vanuatu using this limited climate data. Therefore, APCC generated climatological grid observation data (CGO) using data assimilation techniques. The climate variables generated using the CGO include air temperature and precipitation with a daily tem-poral scale from 1998-2019. This high-resolution climate data was developed to serve as a climate database for agricultural climate services in VaCSA.

High-resolution climate data overview
APCC has developed the high-resolution climate data to serve as the basic information needed to inform national-level agro-met services. This high-resolution climate data will be employed to support local-scale agricultural decision-making. Developing this high-resolution climate data consists of three processes: (1) database construction of raw satellite rainfall estimates (SRE); (2) bias-correction of raw SRE; and (3) statistical spatial downscaling and validation of SRE.

In the first half of the year, APCC constructed the raw SRE for precipitation, performed bias-correction to improve the accuracy of SRE, and produced the early product of SRE. By the end of 2020, the raw satellite data and bias-correction method will be improved, and statistical spatial downscaling will be carried out to produce the final SRE product.

Future application plan
Based on high-resolution historical climate data, various agromet indices (drought, flooding, pest/disease, heat/cold stresses, productivity) serviced through VaCSA can be produced. The high-resolution grid climatology for the agromet indices can be calculated, and based on this data, the relative risk of the current and future agromet index can be provided. The resulting high-resolution, grided, agromet indices using weather observations and fore-casts will be able to provide information to inform location-specific agromet services to farmers in Vanuatu.

The high-resolution grid climatology for the agromet indices can be used as a basis for spatially showing regional agricultural climate risks over the past 30 years. The hot spot analysis result on the map for agricultural climate risks in Vanuatu will be used to increase the awareness of agricultural stakeholders on the various risks that the agricultural sector has experienced in the past. Also, the relatively vulnerable areas identified for specific climate risks will be prioritized for the project-based intervention through targeted agromet services through VaCSA.

Due to the delay of the third disbursement of the GCF fund and current COVID-19 situation, the development of the Vanuatu Climate Services for Agriculture (VaCSA) agro-met service portal platform (temporary URL: http://vacsa.epinet.kr:9091/login.do) has temporarily ceased. As a risk management tactic to support agromet bulletin production for the agriculture sector case study, APCC developed the Monthly AgMetBulletin generator to enable the manual production of monthly agro-met bulletin by VMGD and the agriculture sector coordinator without support from VaCSA IT system. The Monthly AgMetBulletin generator produces high quality rainfall anomaly analysis for use in agro-met bulletins. As a continuous effort to upgrade the generator, APCC has updated it by adding the temperature variable to be able to produce temperature-related agromet indices using the generator. Although the development of this software was not in the initial Van-KIRAP work plan, but came up as an alternative to VaCSA, we now believe that it can provide additional benefits as an additional resources by equipping Vanuatu stakeholders the technical capacities required for the manual production of the agro-met bulletin.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Develop and add function 1: weather and climate information from VMGD connected to VaCSA
Milestone #2: Develop and add function 2: decision support tool incorporating traditional knowledge
Milestone #3: Develop and add function 3: farming activity decision support in the form of a crop yield simulator"
Milestone #4: Develop and add function 4: early warning system for agricultural weather and climate extremes based on VMGD weather extreme early warning information
Milestone #5: Develop Agro-Met bulletin

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.6. Developing tailored Agro-met predictions for target cropping systems; Sub-activity 1.2.6.2. Collecting, modeling, analysis and reporting of agro-met data to determine optimal agriculture crop planning options

Status

Activity started - progress delayed

Implementation Progress

35 %

Progress for the relevant reporting period

An agricultural climate risk profile for Vanuatu has been prepared as a part of the agriculture sector scoping and baseline assessment efforts of Van-KIRAP project, which works to understand the present and potential climate risks in the agricultural sector in Vanuatu and any relevant climate services to cope with the climate risks. The main objective of this pro-file is to provide background information regarding climate-related risks due to climate change and risks from extreme weather and climate events, to define a baseline capacity and the needs for climate services for agriculture in Vanuatu, to increase the awareness of present and future risks, and to provide potential solutions to the identified risks in the agriculture sector. The agriculture climate risk profile will incorporate the new findings from the Agriculture Sector Action Plans prepared by Van-KIRAP. The preparation of Vanuatu agricultural climate risk profile is underway, and will be completed by the end of 2020.

APCC has also developed a software to produce high quality rainfall anomaly analysis for the AgroMet Bulletins, and has conducted a training on how to utilize this software during the trip to Vanuatu in January - February 2020. APCC has also conducted extensive digitization of soil maps for smart agriculture. Prior to this activity, Vanuatu only had access to printed soil maps. With the outputs of this activity, Vanuatu will now have high quality digital GIS soil information.

Development of Agro-Met Bulletin Generation Software
The Monthly Agro-Met Bulletin software was developed to increase the technical capacity of Vanuatu stakeholders for agro-met bulletin production. The Monthly Agro-Met Bulletin software enables the manual production of the monthly agro-met bulletin by local partners without support from an IT system such as VaCSA and even without internet connection. This indicates that the Monthly Agro-Met Bulletin software is a stand-alone tool that can be used under any unexpected IT issues, thus reducing dependence on internet-based, high technology systems.

Although the development of this software was not in the initial Van-KIRAP work plan, it was identified as an essential component for the project due to the recent COVID-19 situation, which has delayed the development of VaCSA system. This software was originally developed to temporarily replace the postponed development of the VaCSA system. However, after seeing the results, it is believed that it can provide additional benefits as an additional resources by equipping stakeholders with the technical capacity required for the manual production of the monthly agro-met bulletin. In this regard, this stand-alone software needs to be continuously updated irrespective of the VaCSA system development. They can be developed in parallel as an alternative risk management option.

Following a simple operational procedure and through an easy-to-use graphical user interface, users will be able to easily produce essential agro-met indices and other related contents for the monthly bulletin. The software generates outputs in the form of images or tables, which can directly be copied and pasted onto the agro-met bulletin template without additional processing.

The agro-met bulletin software was developed using the R package for users to be able to easily produce information utilizing the software. This software can be technically divided into a variable input section and a model execution section. The software is very simple in that the user simply selects the corresponding target year and month, then clicks the “Run VaCSA Modeling” button. The user is required to select three “inputs”: project directory selection, target year, and target month. When the user clicks the “run VaCSA modeling” button after selecting the inputs, the entire internal process is automatically executed. A simple tutorial on how to utilize the software, as well as a description of the algorithm used in the program, is available and was utilized during the training program for VMGD and DARD staff conducted during the trip to Vanuatu (28 January 2020 – 8 February 2020).

Agro-Met Bulletin SOPs Developed and Training Programs Conducted
For the field trials to collect necessary agricultural data for the modelling of agro-met data, the APCC team installed two temporary agro-met sensors with data loggers (“agro-met stations”), in Port Vila at DARD and in Luganville at VARTC. These agro-met stations were installed within 50 meters of experimental plots, and will be utilized to collect hourly data on rainfall, temperature, relative humidity, leaf wetness, and soil moisture for the nearby field trials. Unfortunately, after Tropical Cyclone Harold, reports indicate that these agro-met stations are no longer functioning properly. Further to this, due to COVID-19, the team is unable to go to the field to assess the damage and remedy the situation.

During a mission to Port Vila on 1-7 Feb, 2020, the APCC team collaborated with Mr. Pakoa Leo, Van-KIRAP Agriculture Sector Coordinator, to improve the field trial SOP drafted in 2019, to reflect the crops that have been planted and will be planted in the near future in the Port Vila trial sites. During this trip, the team interviewed local data collectors who will support Pakoa Leo for the field trials to assess their qualitification for the work. The local data collectors, under the supervision of Mr Leo, play key roles in conducting the farm activities required for the field trials with multiple crops. During this trip, another training was conducted on how to collect data using Crop Climate Diary (CCD) to make sure the data collection and uploading on VaCSA system goes well.

Vanuatu digital soil map construction for smart agriculture: GIS-based digital soil distribution
The production of digital GIS soil information, which is essential for the efficient use of agricultural water, can accelerate the realization of smart agriculture in the Vanuatu region. The ‘Office de la recherche scientifique et technique outremer (ORSTOM)’ of France created a soil distribution plot for the New Hebrides archipelago (Vanuatu) in the 1970s. However, the soil distribution map created at that time is printed on a paper map, so accessibility is low and utilization in application fields is low. APCC intends to create a digitalized GIS soil distribution map with work commencing in this area.

In the second half of the year, an agricultural climate risk profile for Vanuatu has been prepared as a part of the agriculture sector scoping and baseline assessment efforts of Van-KIRAP project. The agricultural climate risk profile helps to understand the present and potential climate risks in the agricultural sector in Vanuatu and any relevant climate services to cope with the climate risks, and will be used as a reference for the preparation of agriculture sector case study in 2021.

Since October 2019, CCD has been used in two field trial plots in Port Vila and Luganville. Target crops for VaCSA such as taro, cassava, yam, sweet potato, island cabbage were planted sequentially by DARD and VARTC on both field trial plots, respectively. The field trials are ongoing for now, and will generate modelling-quality agricultural data, which will later be used for agromet modelling to develop agromet services on VaCSA. A high resolution, grided, climate observation data is being developed by merging satellite, observation, and reanalysis data though the state-of-the-art data assimilation techniques. The resulting historical data will be used to tailor climate information to local-scale agricultural decision makings. Knowledge products such as additional decision tree for tomato and pest and disease management options for multiple pests and diseases are drafted to be used in the agriculture case study in 2021.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Agro-data and Met-data collection for selected crops at selected sites
Milestone #2: Generation of high resolution weather and climate data for the base of national level agro-met services
Milestone #3: Agromet Bulletin Stakeholder Workshop
Milestone #4: Combining traditional knowledge and science-based climate smart practices for agriculture decision tree
Milestone #5: Research on agro-met relationships between crops and climate variables
Milestone #6: Develop new agro-models and algorithms based on collected data and knowledge

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.6: Developing tailored Agro-met predictions for target cropping systems; Sub-activity 1.2.6.3. Undertaking field trials and validation prior to incorporation into DSS delivery platforms, ground-truthing and outreach with target Next/End-Users

Status

Activity started - progress delayed

Implementation Progress

5 %

Progress for the relevant reporting period

The crop trial was initiated to fulfill three important aims related to understanding the impact of climate variability on crop production systems. These aims included:

- understanding the physiological responses of selected crops to existing environmental drivers (climate, soil and nutrient interactions);
- developing the capacity to model selected crop and cropping system responses using a process-based crop model; and
- providing agriculturally-translated information to support using the crop model from weather and climate information from VMGD.

The trials in Port Vila and Luganville in Vanuatu has collected measurements regarding biomass accumulation and allocation priorities to above and below ground parts and canopy development for the selected crops. These data have been used to calibrate the existing process-based crop models (DSSAT, APSIM etc).

Since October 2019, the VaCSA Crop Climate Diary (CCD) has been used in two field trial plots in Port Vila and Luganville. For the field sites, target crops for VaCSA such as taro, cassava, yam, sweet potato, island cabbage were planted sequentially by DARD and VARTC on both field trial plots, respectively. The field trials are ongoing for now, and will generate modelling-quality agricultural data by the end of 2020, which will later be used for agromet modelling to develop agromet services on VaCSA. CIS for agriculture requires high resolution climate information to deal with farm decision making, for which we are developing a high resolution, grided, climate observation data by merging satellite, observation, and reanalysis data though the state-of-the-art agromet data assimilation. The resulting historical data will be used to tailor climate information to local-scale agricultural decision makings.

Additional training regarding the use of CCD was conducted in Feb 2020 to the Van KIRAP agricultural coordinator (Mr. Pakoa Leo) who governs all the field trials at DARD and VARTC. APCC has also selected Local Data Collectors (2 located in Port Vila, and 2 located in Luganville) to assist with data collection necessary to move the project forward.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Field trial champions identified
Milestone #2: Develop field trial Standard Operating Procedures (SOPs)
Milestone #3: VaCSA and Agromet Bulletin Training Program
Milestone #4: Conduct field trials with champion farmers and extension officers

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 1.2. Research, modelling and prediction to support CIS tools and uptake

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 1.2.6: Developing tailored Agro-met predictions for target cropping systems; Sub-activity 1.2.6.4. Develop the crop-climate diary customised for agro-met data collection

Status

Activity started - progress delayed

Implementation Progress

70 %

Progress for the relevant reporting period

The Crop Climate Diary has been successfully developed and is being used to collect agricultural data on the field trial plots in Port Vila and Luganville. The CCD has data analysis functions for each trial site based on the weekly and monthly data collection activities. CCD will automatically collect the nearest weather station data based on the planting and harvesting dates of the trial sites and calculate important agromet indices such as growing degree days (GDD) and accumulated rainfall (ARF). All the weather data and the weekly and monthly survey data can be downloaded in an Excel format, so that the users can analyse the data by themselves for subsequent crop modelling and other applications.

The android-based Crop-Climate Diary (CCD) App developed in this project is used to collect data related to crop growing in fields. There are limits to using online map services like Google maps in the app due to the poor wireless internet environment in Vanuatu. There-fore, APCC has produced an offline map that can use map service offline. In order to find the site more easily and conveniently, a map service using satellite imagery such as Google Maps' satellite maps is needed. So, the offline map was produced by using ESA (European Spatial Agency) Sentinel-2A/B satellite imagery with 10m spatial resolution. Al-so, Sentinel-2 satellite imagery has been restored using state-of-the-art AI (Artificial Intelligence) techniques in order to produce more precise high-resolution satellite images. In addition, GIS (Geospatial Information System) techniques has been used to develop an offline map service for the App. This has been incorporated into the CCD and is currently being utilized for data collection by the Local Data Collectors mentioned in sub-activity 1.2.6.3.

Currently CCD is housed in the VaCSA prototype system, where real-time weather observation data from eight AWSs of VMGD are fed into CCD through the prototype database of VaCSA. CCD has been demonstrated to the Agricultural Coordinator and partners in Port Vila and Luganville with subsequent on-site training on how to collect agricultural data using a mobile device and how to upload the data to VaCSA database through and wifi connection. Nevertheless, continuous training for local coordinators and partners, which was necessary to facilitate the data collection activity using CCD, has been delayed due to the COVID-19 situation.

Development and experiment of a prototype algorithm for developing weight estimation algorithm based on a crop area:
APCC has also developed a prototype algorithm for developing weight estimation based on a crop (e.g. taro, cassava) area. The crop weight is calculated using an image taken by a tablet instead of an electronic scale, and has been integrated into the CCD app. Prior to the experiment on Vanuatu local crops, a prototype algorithm was developed and evaluated using sweet potatoes which can be bought in South Korea.

For measuring the weight of a crop using image processing techniques, the method of calculating a crop area and converting it to weight using the calculated area is used. Camera lens distortion and geometry corrections are required in order to calculate the crop area using a camera image. Real distance and area estimations are possible using the corrected image and a regression equation is used to convert the estimated area of the crop into its estimated weight.

The activity has been delayed in the second half of the year due to funding delays and COVID-19 restrictions.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Continue to update the Crop Climate Diary.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 2.1 - CIS implemented within target sectors

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 2.1.1: Investigating the climate sensitivity, potential impacts and vulnerability of food crops in Vanuatu to secure future food security

Status

Activity started - progress delayed

Implementation Progress

25 %

Progress for the relevant reporting period

The agricultural case study progressed in the first half of the year with the site assessments completed and initial activities underway in partnership with APCC. The site assessments were undertaken at nine sites and will directly benefit more than 245 farmers:

 Northcentral and northeast Tanna: Support coffee production (10 farmers) and food crop productions (50 farmers)
 North Malakula: Support cocoa production& coconut production (10 farmers)
 East Santo (VARTC): Support food crop and cash crop production (50 farmers)
 Efate (Port Vila): Support food crop production and kava production (50 farmers)
 Central Pentecost: Support kava production (10 farmers)
 Northwest and South Epi: Support cocoa, onion and food crop production (20 farmers)
 LOH in the Torres Group: Support agricultural crop production (5 farmers)
 Vanualava in the Banks Group: Support food crops and kava production (20 farmers)
 West and north Erromango: Support food crops and kava production (10 farmers)

The outcome of the assessment found that the two most critical climate impacts that must be addressed within the case study are; (a) changing rainfall patterns, and (b) increasing temperature. To assist in providing effective information to assist farmers with managing crops and livestock under climate impacts, the activity will focus upon: (a) demonstration with field trials the use of CIS to make informed farm decisions couple with traditional knowledge (TK) at the sector and community levels, and; (b) undertake a threshold analysis using a climate model for cash and food crops on the identified sites within the country to look at the suitability of growing conditions related to temperature, rainfall, humidity, and other climate variables under future climate change.

In the first quarter of the year, two field trial sites were established at the DARD Tagabe HQ in Port Vila, and the Vanuatu Agriculture Research Institute (VARTC) in East Santo. APCC has installed an agromet weather station at each site, which will provide climate measurements required for the demonstration exercise and collecting, modeling, analysis and reporting of agro-met data to determine optimal agriculture crop planning options (Activity 1.2.6) implemented by APCC. The new data sets that are generated by the agromet stations include:

a) Hourly observations for rainfall (in millimeters)
b) Hourly observations for air temperatures (in degree Celsius)
c) Hourly observations for wind (speed and direction in mph)
d) Hourly observations for soil temperature (in degree Celsius)
e) Hourly observations for soil moisture (volumetric percentage)

The observations stream directly into the APCC Crop Climate Diary (CCD) App and tablets have been provided to DARD officers for the ongoing crop monitoring and input of agriculture information. Trainings and mentoring have been provided by APCC to seven DARD staff (4 males and 3 females) in the use of the CCD App in February 2020. A follow-up training was conducted for three VARTC staff (1 male and 2 female) in late June following Severe Tropical Cyclone Harold. The follow-up training was delivered by the Agriculture sector coordinator and targeted Ms. Florian Lawak (Head of Root crop section), Lilly Fatdal (Head of Horticulture section) and Ricky Max (local data collector).

The on- ground climate observations from the agromet station will be assimilated with other data e.g. satellite, reanalysis data to produce a tailored local climate information to inform local agriculture decision making. It is also supporting the field trials on selected crops eg taro, cassava, yam, sweet potato, island cabbage which have been planted at Tagabe, Efate island and VARTC, Santo island. The weather instrument was not affected by cyclone Harold however an early failure in the batteries caused disruption in the data communication to the CCD App but no data losses occurred.

Continued activities will include the (a) continuation of the on-the-field data collection from the two existing field trials sites; (b) finalise the development and process for issuance of the new Agromet bulletin to target farmers; (c) establish at least 1-2 other field trial sites in the northern and southern part of Vanuatu to compare with existing sites in the central part of the island chain.

For the second half of the year, the activity has been delayed due to funding delays, however, data collection from the agricultural demonstration sites and maintenance of the trial plots has continued throughout the reporting period. The maintenance of the plots has been challenging due to the limited resources available.

Since the declaration of the current La Nina event in early September 2020, the Department of Agriculture and Rural Development (DARD) has worked closely with VMGD to prepare monthly climate updates (e.g. VCU and Agro-Met Bulletin), weather advisories and to undertake cyclone preparedness. Public events including the ‘Christmas in the Park’ celebrations and Vanuatu LDC graduation day have been useful forums to highlight these materials to the public.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Sub-activity 2.1.1: Establishment of demonstration plots for food crops in order to show the use of CIS at the community level
Milestone #1: Establishment of demonstration plots for food crops in order to show the use of CIS at the community level

Sub-activity 2.1.2: Conduct threshold analysis of crops using climate models
Milestone #2: Commence arrangements to conduct threshold analysis of crops using climate models

Sub-activity 2.1.3: Develop CIS tools, products and information for the target sector
Milestone #3: Work with APCC to test the Crop Climate Diary at demonstration sites

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 2.1 - CIS implemented within target sectors

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 2.1.2: Improving food security in Vanuatu by using climate information to prepare for and respond to temperature impacts on coastal fisheries

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

Assessment of the sites has been undertaken by the Fisheries Coordinator and staff of the Vanuatu Fisheries Department (VFD). The assessment objective was to undertake baseline evaluation and determine suitable sites for the installation of the ocean monitoring equipment. In addition, stakeholder consultations with local fisheries communities were undertaken in order to understand the community needs, and how communities receive and utilise climate information services, and what on-ground activities would best benefit the communities.

The assessment findings recommended the installation of at least two ocean buoys with radio receiving equipment inside selected fisheries locations of the Fisheries Case Study. The sites include (a) Naone on Maewo island; (b) Toman on Malekula island; (c) Votlo on Epi island and (d) Port Resolution on Tanna island. The installation of the ocean monitoring equipment will collect data to demonstrate influences of climate and ocean changes to fisheries resources. The activity will also contribute to sub-activity 1.2.5.2 undertaking preliminary climate hotspotting for coastal areas e.g coral bleaching and more. The four sites were selected based on thermal histories and climate projections by Maynard et al (2018) report.

During the stakeholder consultations with local fisheries communities there was demonstrated interest in the establishment of marine protected areas (MPAs) (either customary local tabu areas or formal CCAs) as a mechanism for protecting fisheries habitats and fish populations to support recruitment of fish stocks in adjacent areas that are impacted by marine heatwaves and coral bleaching. To monitor the health of the reef ecosystem, fish catch data will be collected using an e-monitoring toolkit.

In April 2020, the Fisheries Coordinator resigned from the project after being accepted by the Vanuatu Public Service Commission (PSC) to take a senior role within the Vanuatu Fisheries Department. The recruitment and selection of a replacement has just being finalised with the new incumbent commencing in January 2021.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Activity 2.1.2.1: Establish management plans for community MPAs
Milestone #1: Community consultations
(a) Undertake community consultations at sites in Efate, Toman Island, Aneityum island and South east Epi
(b) Undertake baseline data collection at sites
(c) Establish tabu eria (CBFM areas)
(d) Develop and commence implementation of e-monitoring
(e) Commence development of the Community Management Plans

Sub-activity 2.1.2.2a: Responding to Marine thermal stress event
Milestone #2: Developing climate data for fisheries hotspots
(a) Identify and establish coral reef monitoring sites at Efate, Toman Island, Aneityum island and South east Epi
(b) Establishment of a community monitor to log catch from each site through an e-reporting tool
(c) Deployment of temperature and pH loggers at monitoring sites
(d) Historical data collection: Questionnaire developed and surveys undertaken; Data analysed; Data report
(e) Undertake community awareness and information sessions
(f) Procure and deploy ocean buoys

Sub-activity 2.1.2.2b: Building knowledge to respond to extreme climate events
Milestone #3: Community monitoring programme established at Efate, Toman Island, Aneityum island and South east Epi
(a) Community information and awareness on climate change and impacts on marine resources
(b) Implementation of Vanuatu Community Marine Monitoring Toolkit and TAILS

Sub-activity 2.1.2.3: Develop alternative food preservation methods
Milestone #4: Establishment of storage facilities at Efate, Toman Island, Aneityum island and South east Epi
(a) Undertake scoping at sites
(b) Establish collaboration Fisheries bodies in communities
(c) Establish collaboration Fish Market Committee
(d) Facilitate training of Fish Market Committee in operations
(e) Procure and install cold storage facilities
(f) Facilitate training of Fish Market Committee on cold storage facilities

Sub-activity 2.1.2.4: Community engagement and awareness
Milestone #5: Raising community awareness of CIS
(a) Review existing CIS materials
(b) Undertake sectoral information workshops
(c) Undertake community information sessions

Sub-activity 2.1.2.5: Training and Capacity Building
Milestone #6: Training and capacity building within sector
(a) Undertake technical trainings on pH meter calibration, climate adaptation techniques, advanced GIS and model projections.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 2.1 - CIS implemented within target sectors

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 2.1.3: Upgrade the standard infrastructure design in the Vanuatu Public Works Department using climate data on low–lying 'hotspot' and coastal erosion areas

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

Site assessments have been conducted by the Infrastructure Sector Coordinator and Public Works engineers on four sites identified in three Provinces for the on-ground application and demonstration of CIS (refer Table 1). All of the identified sites are in coastal or low-lying areas subject to flooding and inundation. Infrastructure at these sites is often impacted during extreme events, e.g. heavy rainfall and storms, with vehicle access cut-off making it hard for end users to reach commercial centres or markets. The site selection took into consideration the following factors:

 The nature of structure in terms of size how big and wide
 The location of the sites in coastal or low –lying areas
 The population in surrounding areas that access the structured daily and how they will be affected during climate event. In the past, there have been periods, when people have been cut off from commercial centres because access wasn't possible due to a climate event, e.g. flooding.

Identified sites for the Infrastructure case study include:

Province Infrastructure Focus Status
Efate Mele Bridge Completed
Teuoma Bridge Design phase
Tanna Lowantom Bridge Completed
Malekula Sarmet Brdige Under construction

Whilst the initial focus of the case study is only on the four sites, the information obtained and application of the decision support systems and tools, will enable the PWD to replicate the methods across to other sites as necessary.

The finding of the site assessments has led to the formulation of the draft Infrastructure Sector Plan, which will undertake core activities aimed at developing support tools (e.g. models on risk-based coastal and hazard mapping, vulnerability of coastal zones, seasonal climate forecasts and long-term projections), and improving the ability of decision-makers within the Public Works Department to plan for, and respond to, short-and-long term impacts of climate variability and change on infrastructure within Vanuatu.

Procurement is underway for the LiDaR and drone technology to collect bathymetry and topographic data required to support the mapping and modelling.

Due to delays in funding, the focus for the second part of the year has been on finalising the technical specifications of equipment and capacity building. In September, the Infrastructure Sector Coordinator attended a Geospatial Information System (GIS) training workshop facilitated by UNITAR/UNOSAT on Advanced Training on Earth Observation and Geospatial Information Technology Applications for Climate Resilience. The training covered aspects including:

• Climate related disaster assessment
• Advising communities prone to disaster during heavy rain or cyclone
• Advising decision makers on the affected populated area during a disaster event.

This training workshop complements the work of the Infrastructure sector under Van KIRAP particularly relating to the climate resilient design of culverts and bridges. Newly acquired GIS tools and skills from the training will be applied to this work.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Developing climate data for "hotspots"
(a) Finalise procurement of equipment
(b) Commence bathymetric and topographic data collection from sites

Milestone #2: Update design standards for infrastructure e.g. road structures, bridges, culverts and seawalls
(a) Commence review of the design standards

Milestone #3: Training and capacity building of PWD personnel
(a) Undertake trainings in climate information services, and data collection and data management

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 2.1 - CIS implemented within target sectors

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 2.1.4: Increasing climate resilience in flood prone areas - Sarakata Flood Plain

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

The site is located on the Island of Espiritu Santo, Sanma Province, within the Sarakata River flood plain. The area encompasses the Luganville central business district and extends to adjacent suburbs on the flood plain. Luganville is the second largest town in Vanuatu and hosts a population of approximately 15,000 people.

The Sarakata pilot area is an existing priority for the Department of Water Resources (DoWR) to revive its hydrological station(s). Ultimately, the case study is intended to support climate information initiatives such as Flood Early Warning Systems. In the medium to long term perspective, the DOWR plans to support decision-making in the area council and municipality with localized climate projections, flood models and identifying flood prone areas, and a support tool to response to flooding events in the future.

The site assessment (including identification of key priorities) and consultations with local stakeholders for the Sarakata flood plain was conducted in October 2019. Progress has been made on defining equipment specifications for the automatic river monitoring gauges with these to be procured following the release of the next funding tranche. Further actions will be undertaken following reassessment of work programmes in line with COVID-19 restrictions.

The Sector has been working closely with the WASH programme to address water safety issues during the current active La Nina event. This has been particularly important given the recent flooding events in Sanma Province which saw 25 confirmed cases and five deaths due to leptospirosis over the past six months. Additional awareness events relating to water safety undertaken during the reporting period to provide more emphasis and awareness of climate impacts on potential water sources included:

• The National Climate Change Week (12-16 October): dissemination of information and materials on water and climate change and water preparedness under La Nina events.
• Implementation of the Drinking Water Safety and Security Plan took place in November and December 2020 for urban and rural water supply systems in; Lakatoro - Malekula, Saratamata - Ambae, Laone - Maewo and Big Bay Bush - Malekula.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Sub-activity 1.2.4.1a: Enhancing stream monitoring capabilities in the Sarakata River catchment
Milestone #1: Data collection and analysis
(a) Finalise river monitoring gauge procurement and installation
(b) Commence data analysis and upload into the CLEWS
Deliverable #1:
(a) Monitoring Reports

Sub-Activity 2.1.4.1b: Develop and implement a Flood Management and Response Plan for the Sarakata catchment
Milestone #2: Flood Management Plan
(a) Develop community consultation plan and undertake community consultations to identify community approaches to flood mitigation
(b) Review existing flood mitigation guidelines
(c) Undertake flood management and response training
Deliverable #2:
(a) Commencement of development of flood management plan

Milestone #3: Flood early warning system
(a) Undertake data collection, monitoring and analysis
(b) Commence groundwater and flood analysis
(c) Commence early development of the flood hazard map (Q4)

Sub-Activity 2.1.4.2: Undertake groundwater modelling to support Urban Water Management
Milestone #4: SANMA Integrated Water Resources Management Committee
(a) Establish IWRM Committee and workplan
Deliverable #4:
(a) Terms of reference, workplan and minutes of meetings

Milestone #5: Groundwater Mapping and Monitoring
(a) Undertake groundwater mapping and monitoring training
(b) Upgrade existing monitoring boreholes to developed standards
(c) Commence groundwater data analysis
(d) Commence groundwater piezometric mapping

Sub-Activity 2.1.4.3: Develop and disseminate CIS tools and information
Milestone #6: Develop and disseminate CIS
(a) Commence Water Sector Climate Information Services Needs Assessment
(b) Commence review of Water Sector Existing Awareness & Communication Plans
(c) Undertake the Community Projects Needs Assessment

Sub-Activity 2.1.4.4: Training and capacity building of the Department of Water Resources personnel
Milestone #7: Training and capacity building
(a) Integrated Flood Management & Response Plan training
(b) Flood Early Warning System training
(c) Hydrology and groundwater modelling capacity building activities
(d) Training of DWR personnel on data monitoring, collection, analysis and collation

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 2.1 - CIS implemented within target sectors

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 2.1.5: Minimizing the impacts of climate variability and change on tourism development through supporting adaptation

Status

Activity started - progress delayed

Implementation Progress

12 %

Progress for the relevant reporting period

Site assessments including stakeholder consultations were conducted in East Santo (September 2019) and Port Resolution, Tanna island (October 2019) – both islands are key tourism destinations within Vanuatu. Stakeholder consultations were undertaken with 20 tourism operators in East Santo and 15 operators in Port Resolution. The consultations were aimed at:

 introducing the project and its objectives
 engaging with capable hotel operators who are interested in participating in the case study
 collecting baseline information
 investigating, identifying and confirming suitable sites for the demonstration of the use of CIS for tourism planning and operations
 seek consent for the project to operate by the traditional Chiefs or landowners. Land clearances have been signed with the local land owners in the two case study sites. A consent form has been signed by traditional Chiefs or landowners.

The eastern Coast of Santo (Sanma Province) is selected as a common case study site where all five sector coordinators are working together in assessing the impacts of climate change. The Island of Santo is located approximately 308 kilometres from Port Vila on Efate Island. The main tourist sites are currently under threat to sea level rise, drought, flooding, storm surges and other climate change related issues. The case study sites are located approximately an hour's drive from Luganville Town.

Port Resolution (Tafea Province) is the second case study site located on the east coast of Tanna. Tanna Island is in the south of Vanuatu approximately 228 kilometres (35 minute flight) from Efate Island. The Island hosts the active and accessible Yasur volcano, authentic culture and other attractions.

During the visits, nine tourism operators have expressed a willingness to participate, and a communication process was agreed to, illustrating the approach for how CIS will be delivered to the target tourism operators (refer Figure 1). The tourism operators have encouraged the use of the main focal points (e.g Provincial Tourism Office based in Santo) to assist with information awareness and dissemination of products and tools.

A follow-up workshop was conducted in collaboration with CSIRO in Santo (February 2020). The CSIRO climate modelling team inspected the East Santo site and confirmed the high rates of coastal erosion at the site. The erosion has already impacted the foundations of some of the tourism bungalows near the water and the encroachment of the rising seas will mean economic losses to the tourism operators and the local community livelihood. The team considered this site as a priority for the detailed climate change projections/modelling that will be undertaken by CSIRO. A climate impact assessment will be undertaken and a range of possible solutions to address the accelerated erosion in the area will be provided and worked through with operators.

In the remainder of 2020 and early 2021, the following activities will commence: (a) developing the climate impact assessment for East Santo and Tanna; (b) review, package and tailor existing climate information for local tourism operators; (c) undertake Information sessions for local tourism operators demonstrating how to use existing climate information in their business planning and (d) establish an early warning system for tourism operators.

Cyclone Harold assistance
In April following tropical cyclone Harold, the Tourism Sector Coordinator provided assistance to the Tourism Team to assess the damage on the tourism sector and to assist with the Post Disaster Needs Assessment and Finalisation of the Tourism Recovery Plan (incorporating both Cyclone Harold and COVID-19).

In the period from July - December, consultations with tourism operators commenced to update operators on the project and available climate information services, as well as seeking their endorsement to be part of the Project's sector case study. In addition, the tourism sector coordinator has undertaken a number of capacity building and awareness events including:

• Participation on the JICA CBCRP / Pacific Climate Change Center (PCCC) Virtual Training on Climate Science. The regional training covered topics on the observed climate change and future climate projections, enabling a greater understanding of how climate change projection information can be mainstreamed into national and provincial policies and plans to mitigate the lasting impacts of climate change.
• Support was provided by the sector coordinator to the Department of Tourism, National Tourism Forum held at the Chief's Nakamal. The meeting involved over 50 tourism stakeholders within the six Provinces of Vanuatu and focuses on sustainable tourism. The Van-KIRAP Tourism Action Plan and implementation timelines was discussed and widely supported by the participants and sector stakeholders.
• A presentation was provided to approximately 40 staff from the Department of Tourism at their staff retreat. Emphasis was made on the need for respective tourism staff to understand the Tourism Sector Implementation Plan and include activities in their respective work programs. Follow-up consultations were undertaken to ensure activities under the tourism workplan are aligned with sector priorities.
• The project contributed towards a presentation for the Seventh Pacific Islands Climate Outlook Forum (PICOF-7) on Vanuatu's experience with regards to climate outlooks and the tourism sector. The Van-KIRAP presentation generated dialogue and interest amongst the 100 attendees, particularly with regards to the traditional knowledge component and the tailored climate bulletins (prototypes) developed to manage climate risks in the sector.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-

expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Increasing the uptake of climate information services in the tourism sector
(a) Undertake review of existing CIS tools and repackage to suit the needs of tourist operators
(b) Undertake information awareness sessions on CIS information and tools with tourist operators

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 2.1 - CIS implemented within target sectors

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 2.1.6 Site Assessments

Status

Completed

Implementation Progress

100 %

Progress for the relevant reporting period

The site assessments were undertaken in the last quarter of 2019 under the six-monthly workplan, designed to meet the conditions of the FAA. The site assessments included sites for both the Sectoral case studies and the community engagement.

Details of the assessments on the Sector case studies is detailed in the above activities. For the community engagement, a total of 16 site assessments were completed - 12 original site assessments and an additional four sites (utilised as additional options in case of land disputes etc). The sites visited were:

Climate center site Province Comments
1. Sola, Vanua Lava Islands Torba Province Co-locate with provinvial emergency operating center; Meet all selection criteria; Department of Local affairs recommend this site
2. Loh Island Torba Province Co-locate with VCAP building
3. Saratamata, Ambae island Penama Province VMGD office is located here serving local communities in this region. Meet all selection criteria
4. Melsisi, Pentecost island Penama Province North Pentecost and will co-locate with Provincial Emergency Operating Centre Meet all selection criteria
5. Lakatoro, Malekula island Malampa Province South West Malekula, Co-locate with Area Secretary in this area. Department of Local Affairs recommends this site. Meets all selection criteria
6. Wintua, Malekula island Malampa Province Co-locate with Wintua Island Council
7. Lamap, Malekula island Malampa Province South of Malekula islands. Meet all selection criteria
8. Olal, Abryum island Malampa Province North of Abryum islands. Meet all selection criteria
9. Rovo bay, Epi island Shefa Province Possible to have one in Tongoa/Emae. Site assessment will be required for the sites
10. Rovoliu, Epi island Shefa Province Meet all selection Criteria, co-locate with Rovoliu area council. Area Secretary exists
11. Dillons bay, Erromango islands Tafea Province South Erromango
12. Ipota, Erromango islands Tafea Province Co-locate with Ipota Agriculture field assistance office
13. Isangel, Tanna island Tafea Province Co-locate with Isangel Agriculture office / Provincial Headquarters
14. Aneityum island Tafea Province Meet all selection criteria
15. Luganville, Santo Island Sanma Province South Santo. Co-locate with Vanuatu Agricultural Research Training Center (VARTC)
16. Nakere, Santo Island Sanma Province South Santo

The aim of the site assessments was to undertake detailed assessment of proposed Climate Centres and report on land ownership, building current condition, refurbishment, information resourcing, CIS use and applications, community activities etc. A set of criteria was also development by the PMU to guide the evaluation. The criteria details include but not limited to the following:

Criteria Details
1. Must be an existing facility/building in good working condition
2. Must be secured and build in accordance with the Vanuatu Building Code and meet all Health and Safety Working Conditions requirements
3. At least two Community Climate Change established in each of the six Provinces of Vanuatu
4. Ability to service multiple villages and therefore a substantial population in the Province
5. Must be in close proximity to sector case study sites and/or instrument sites
6. Must be in proximity to vulnerable hotspot locations (e.g. drought prone areas)
7. Maximising social equity and inclusion (as per the project ESMP and Gender Action Plan)
8. Recognized and performing functions that aligns with work of Government through the Disaster Management Office (NDMO) and the Department of Local Affairs (DLA)

Key outcomes of the site assessments include the confirmation of all sites to be utilised as community climate centres (CCC). The conditions of the sites and assets thereon differs and the reports provide site specific recommendations on improvements that is required to meet the desired CCC functions.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

n/a

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 2.2: CIS is incorporated into community practices

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 2.2.1: Establishing community CIS sites

Status

Activity started - progress delayed

Implementation Progress

5 %

Progress for the relevant reporting period

Initial site assessments were undertaken in late 2019 and next steps identified. Whilst the activity was placed temporarily on hold in 2020 until the Community Coordinator was recruited, initial actions have been undertaken in preparation for the rollout including:

(a) The section criteria for the Climate Focal Points has been developed (refer Table below).
(b) In late 2019, the proposed sites for community climate centres and focal points were assessed and identified after consultations with the Department of Local Affairs (DLA) and the Disaster Management Office.

Climate Focal Points Selection Criteria:
1. A volunteer nominated by the Chief and has a good standing in the community
2. Has strong communication skills in English, Bislama and one other language (French)
3. An active member of a community council or network (e.g. volunteer rainfall network (VRN), climate change and disaster committee (CCDC), environmental council Red Cross volunteer, provincial officers
4. Self motivated and ability to motivate/mentor others
5. Has a basic understanding of climate and weather
6. Maximising social equity and inclusion
7. Reside within the community for the full duration of the project

The role of the Climate Focal Point will support on-going training and support, communications with the Community Coordinator and sector coordinators and, undertake overall coordination of local stakeholders and the dissemination of information. In addition, the focus will be on ensuring community-based development incorporates and applies CIS in appropriate ways and will support and employ existing government communications channels for the receiving and re-distribution of CIS to sectors and community users at provincial level. This will be strengthened by establishing new and/or enhancing existing community centres as a hub for climate information and knowledge sharing.

The assessment reports for all 16 Climate Centres were submitted in early 2020. The assessments were conducted in parallel with the assessment of the Climate Focal points (CFP). The main outcome of the assessment indicated that in all the CCC sites, at least two Climate Focal Points have been identified. The people identified are trusted volunteers that are already entrenched in the community. Some are currently Community Climate Change and Disaster (CCCD) volunteers, Area Council and Provincial Officers, Vanuatu Rainfall Network (VRN) volunteers or similar.

The Climate Focal Points will be working alongside the Community Coordinator who will be recruited in the second half of 2020 to develop the work plans for this activity as well as working with the PMU to implement it. Contracts with all Climate Focal Points will be developed to govern the implementation of the roles and responsibilities of the CFP.

Community Coordinator Recruitment
The tender for the recruitment of a Community Coordinator to undertake the planning and implementation of core activities linking climate information services to communities in the six Provinces was undertaken in the latter part of 2020. The Coordinator will commence in early 2021.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Community Engagement Strategy and Action Plan
(a) Develop Community Engagement Strategy and Action Plan
(b) Commence implementation of actions identified in the Action Plan

Milestone #2: Establishment of community level CIS
(a) Establish four sites in two Provinces (Sanma and Torba)
(b) Establish climate centres at sites and the community champions and networks

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 2.3: A socio-economic benefit analysis for Vanuatu using the customised Pacific CIS cost-benefit Framework is produced

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 2.3.1: Undertake a socio-economic benefit analysis for Vanuatu using the customized Pacific CIS Cost-benefit Framework

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

Climate change poses a number of significant threats to the socio-economic development of Vanuatu. Sector specific impacts, human health issues, extreme events all threaten the welfare and resilience of Vanuatu. For this activity a key assumption which will be tested is that science-based CIS used as an evidence base for sectoral decision-making to mitigate sovereign/sub-sovereign physical climate change risk will generate tangible (measurable) on-ground benefits to Vanuatu, compared to the counter-factual where CIS are not used to inform decision-making by sectors.

Results to date include the following:
• Developed a workflow for the analysis of climate change impacts, and inclusion of these impacts into the Global Trade and Environment Model (GTEM), and Global Trade and Analysis Project (GTAP) Model where appropriate.
• For the tourism sector, performed an econometric analysis of the longitudinal effects of climate change, in particular tropical cyclones, on-demand for tour-ism services, visiting friend and relatives (VFR), immigration and work arrivals. The result is a stochastic model of tropic cyclone impacts, that can take in future tropical cyclones and other climate change factors, and estimate the changes in tourism demand.
• Estimated the productivity changes that occur in the agricultural sector from FAO and regionalised climate data, following the methodologies in Cai et al. 2016 and Porfirio et al. 2018. A household and national level metrics of projected self-sufficiency for agricultural sustainability in Vanuatu has also been developed.
• Explored foreign direct investment (from the WTO data) into infrastructure in Vanuatu, and the occurrence of tropical cyclones, and changes in environmental conditions. A second-order econometric model that estimates the short impacts and long term benefits of infrastructure investment is currently under development. The effect of proposed infrastructure investments on improved infrastructure is also being explored.
• Developed a methodology and set of dashboard indicators for socio-economic impacts including changes in macroeconomic conditions include (but not limited to) GDP, Terms of Trade, Investment and Savings, sector output (agriculture, services, infrastructure, among others), changes in consumption and prices bundles, and changes in foreign aid demand.

The results from progress up to February 2020 were presented to a stakeholders workshop in Santo with a focus on how VMGD and the target Sectors could use the results.

The activity has been delayed in the second half of the year due to funding delays. With the recommencement in November, the team has scoped out the first cohort of macro-economic analysis to be undertaken for this Activity, including requisite methods (using GTEM-growth model as per outcomes of six month interim work plan) and CIS data outputs. In addition, the actual analysis has been initiated as follows:

• Estimate macro-economic impacts of climate change in Vanuatu based on agreed, globally consistent emissions scenario analysis (RCPs and SSPs aligned with Activity 1.2.3) :
o at economy and selected sectoral scale (latter subject to available data)
o for specified climate variables and perturbations/shocks, and
o with sensitivity analysis compared against appropriate climate counterfactual(s)

Delivery of appropriately curated (QAQCd) data set comprising relevant model output in form of macro-economic indicators/metrics, and associated metadata and documentation in agreed digital format, will form the basis of the first cohort of data to (i) inform first iteration of CIS products for June 30 milestone reporting, and (ii) inform baseline data for the Van KIRAP project M&E analysis and reporting.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Develop Version1.0 (V1.0) SEB database framework (system design and beta version operational system)

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 3.1. Traditional knowledge is incorporated into climate information services in Vanuatu

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 3.1.1: Integrating Traditional Knowledge into CIS tools and information

Status	Implementation Progress
Activity started - progress on track	25 %

Progress for the relevant reporting period

Progress on this activity has been steadily progressing with assistance from BOM and SPREP, with the initial focus on building capacity within the VMGD traditional knowledge unit and assisting in the development of the Traditional Knowledge Strategy and Workplan. During the October 2019 visit, consultations with all traditional knowledge stakeholders were undertaken to inform the strategy development. An initial draft was developed during time, with a final draft submitted in early 2020 following inputs from Sectors and VMGD. Further work to incorporate the science, sectoral and community approaches, as well as linkages to the communication and engagement work, and gender action plan will need to be considered in the remaining period of 2020.

The strategy provides a guiding framework for the project to build on best practices from the COSPac Program, and to continue to ensure its processes and lessons learnt are carried forward in this project. It outlines plans to enhance TK capacity within VMGD encompassing all aspects into CIS tools, that involves all delivery partners and NGOs Implementation will start in the second half of 2020. The Traditional Knowledge Strategy focuses on three main objectives:
a) Continue the collection of traditional knowledge from existing sites.
b) Establish new traditional knowledge sites where additional data can complement existing knowledge and information.
c) Develop and tailor sectoral relevant traditional knowledge information and CIS to minimise the climate risks associated with climate variability and long-term climate change.

Following the assessment of the traditional knowledge sites in 2019, new sites to include in the traditional knowledge component have been proposed:

a. North Efate, Efate island (Shefa Province)
b. Makira, Sheperds island (Shefa Province)
c. West Coast, Santo island (Sanma Province)
d. East Malo, Malo island (Sanma Province)

Activities underway include:

 The traditional knowledge database management is on-going.
 There are four islands nominated as TK collection sites: Ureparapara (Torba province) whole Island; Pentecost Island (Penamana province), northern part; Malekula Island (Malampa province), central part including Uripiv and Uri Islands and; Tanna Island (Tafea province), southern part. TK indicator inspections have continued only on Efate island due to funding delays. The expansion of the TK networks has been delayed due to limited funding. However, connections to TK data collectors have been maintained via phone call reports. TK collection in the remaining provinces of Sanma (Santo / Malo) and Shefa province (Efate / Sheperds) will be undertaken following the third disbursement.
 There has been continued collection and collation of new traditional knowledge and monitoring of environmental indicators, animal and plant behaviour from existing sites. This information was used for the verification of the climate bulletins e.g. Vanuatu Climate Update – which were issued during the reporting period. The traditional knowledge indicators collection is on-going via informal discussions, collection during awareness programs and, from social media post from the Vanuatu Agromet Facebook page. Quarterly monitoring on traditional knowledge indicators for the dry season, wet season and tropical cyclones from each Province is on-going.
 The Vanuatu Rainfall Network (VRN) is used by TK to collect the climate impacts from the areas every quarter. After each weather phenomena event, phone calls to the VRN are made to obtain their TK observations.
 Established new traditional knowledge observations network where additional data can complement existing knowledge and information. Planned activities to expand traditional knowledge observation sites in Efate (Pemana Province) and in Santo (Sanma Province) has been delayed due to delays in the disbursement of funding.
 TK climate products e.g. brochures and posters, have been developed and translated into three languages mainly for SHEFA province.
 Developed and tailored sectorial relevant traditional knowledge information and CIS to minimise the climate risks associated with climate variability and long-term climate change. This included a number of traditional knowledge awareness and outreach activities over the reporting period including the development and distribution of 300 copies (100 in English, 100 in Bislama and 100 in French) of a traditional knowledge brochure and distributed within the off-shore islands from Efate. Traditional knowledge brochures were also distributed to visiting schools as part of the World Meteorological Day celebrations.
 Participation at the following occurred during the reporting period: Vanuatu Nation-al Arts Festival (NAF) in Malekula; Slow Food Festivals (SFF), in Maewo Island; Early Action Rainfall watch (EAR), Port Vila and; National Outlook Forum (NCOF), Port Vila.
 The Tourism, Fisheries and Agriculture monthly bulletins have incorporated a traditional knowledge section.
 In March, the Traditional Knowledge Officer was a guest of the Vanuatu Broadcasting Telecommunication Corporation (VBTC) to discuss the importance of traditional knowledge activities in Vanuatu and its contributions to the impacts posed by a changing climate. The program was well-received with more than 20 listeners calling in and participating in the Q&A, as well as providing contributions to the traditional knowledge discussions.
 Other traditional knowledge outreach activities were undertaken within Efate including discussions during programmes on the Vanuatu Broadcasting Television Corporation (VBTC) radio talk back shows. VBTC Radio Announcer Ronsly Lowenbu hosted three TK radio talk-back shows for Van-KIRAP featuring Albert Willy, the Van-KIRAP TK Officer and Allan Rarai, the Acting Director, VMGD. The radio programme generated a lot of interest from listeners from across Vanuatu.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Recruitment of the second traditional knowledge officer
Milestone #2: Undertake training of the traditional knowledge and Vanuatu Rainfall Network volunteers on traditional knowledge data collection, recording and reporting
Milestone #3: Establishment of 1-2 new traditional knowledge sites.
Milestone #4: Undertake data collection from new sites.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 3.2. Development of CIS tools and information products

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 3.2.1: Developing CIS tools and information products for target end-users; Sub-activity 3.2.1.1. Customising CIS decision support systems (DSS) for target sectors and communities

Status

Activity not yet due

Implementation Progress

5 %

Progress for the relevant reporting period

As with sub-activity 3.2.1.2, this activity is a 'whole-of-project' approach. Due to delays in project commencement, and the need to progress the technical aspects of the project in order to develop the DSS, this activity is not expected to be fully operational until the mid-point of the project. However, there has been some early progress on the development of tools including:

 A draft prototype for an Agromet bulletin from the Department of Agriculture and Rural Development has been developed and is in the process of gathering feedback.
 Two draft prototype Tourism climate bulletins have been developed by VMGD for feedback and inputs from the tourism sector.
 A set of initial prototypes has been developed incorporating climate information science with traditional knowledge (as part of Activity 3.1.1) which could be used for communication purposes to drive greater engagement with the community on preparedness and responses to climate extremes. By combining traditional knowledge indicators with climate science the aim is to promote and protect traditional knowledge and drive uptake of planning and preparedness activities. The prototypes include:

• Tropical Cyclone season preparedness and seasonal indicators
• Drought seasonal forecasts/early warnings and traditional knowledge indicators
• Changing tides and sea level
• Cool/dry season impacts and preparedness
• Warm/wet season impacts and preparedness

The next steps will include sourcing broader input from the Van-KIRAP project team, particularly the traditional knowledge expertise in Vanuatu and SPREP.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Work to continue on the development of CIS information and DSS as the tools emerge from the Project activities.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 3.2. Development of CIS tools and information products

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 3.2.1: Developing CIS tools and information products for target end-users; Sub-activity 3.2.1.2. Suite of forecast-based CIS ground-truthed, operationalised and outreached with Next/End-Users

Status

Activity not yet due

Implementation Progress

5 %

Progress for the relevant reporting period

Initial activity has commenced focusing upon the incorporation of traditional knowledge into climate information, and subsequent tools and products. Scoping of initial traditional knowledge information included the potential use of Apps for capturing local traditional knowledge indicators which could assist in developing a database of traditional knowledge indicators which could be used as indicators for groundtruthing as well as an outreach mechanism for end users. Scoping meetings with App developers Earthwatch have been undertaken, with the goal to augment an App called ClimateWatch. It is anticipated the App could be used to: (i) capture traditional and local knowledge, and (ii) be incorporated with climate data to assist the Vanuatu traditional knowledge lead with a simplified platform from which to demonstrate information back to communities, and to receive and access information in real-time. Work on scoping effective ways to groundtruth and operationalise traditional knowledge CIS will continue to be integrated with user needs and requirements.

Scoping of initial traditional knowledge information was also undertaken. This included the potential use of apps for capturing local traditional knowledge indicators which could help to build up a database of traditional knowledge indicators and also be used as indicators for groundtruthing as well as an outreach mechanism for end users. This included scoping and evaluating meeting with app developers Earthwatch to augment an app called ClimateWatch. This app could be used to capture traditional and local knowledge, be incorporated with climate data to assist the Vanuatu traditional knowledge lead to integrate with communities and provide them with an easy way to not only feed information in, but also receive and access information. Work on scoping effective ways to groundtruth and operationalise traditional knowledge CIS will continue to integrate with user needs and requirements.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Work to continue on the development of CIS information and DSS as the tools emerge from the Project activities.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 3.3. Implementing knowledge management, engagement and outreach across Sectors and Communities

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 3.3.1: Knowledge management, communication and outreach

Status

Activity started - progress delayed

Implementation Progress

5 %

Progress for the relevant reporting period

This activity has been delayed whilst the conditions of the FAA have been met. With the recent approval by the GCF, recruitment for a long-term, local communications specialist commenced with an expected start date in June/July 2021. The appointment will trigger the full implementation of actions under this activity.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Finalise appointment of the Communication Coordinator
Milestone #2: Development of the Communication and Engagement Strategy
Milestone #3: Implementation of actions identified under the Strategy

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 4.1. Institutional capacity to implement CIS across sectors strengthened

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 4.1.1: Strengthening CIS coordination and response mechanisms for target sectors

Status

Activity started - progress delayed

Implementation Progress

10 %

Progress for the relevant reporting period

As outlined in the 2019 APR, the policies for the five target sectors (agriculture, fisheries, infrastructure, water and tourism) were reviewed as part of the overall activity to develop Sector Action and Communication Plans. These plans have been completed and guided the detailed development of the Sector work programmes.

The policy review also highlighted areas of opportunities whereby the Project could contribute towards the higher sectoral goals (and this will be a focus for the forthcoming monitoring and evaluation plan) as well as identifying gaps in how climate information is managed and distributed throughout each Ministry.

The next step identified in this activity is to develop a decision support tree for each Sector, identifying the entry points for climate information, the responsibilities within the Ministry and the pathways for dissemination and uptake within the Ministry, and from there, out to each sector on-ground. The activity will also closely integrate with the Sectoral case studies, communication and engagement work and the community engagement work area. Further detail will be developed in 2021 following the recruitment of the Communication Coordinator and Community Coordinator.

The sector CIS Training Manual has been completed and will be delivered to all targeted sectors from 2021 onwards. The manual has been designed to assist facilitators from the Meteorology backgraound to educate all sectors on weather, climate variability and climate change. The aim is to have all five sectors understand climate and its impacts, be able to recognize slow onset of phenomena e.g. drought, inform VMGD on which information and format/medium is relevant for their target audience, so that one can make informed decisions ahead.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Commence the development of the CIS decision-support tree for each sector identifying the entry points for climate information, the responsibilities within the Ministry and the pathways for dissemination and uptake within the Ministry, and from there, out to each sector on-ground
Milestone #2: Review of existing CIS for Sectors and upgrade tools and information available.
Milestone #3: Conduct information and training sessions.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 4.1. Institutional capacity to implement CIS across sectors strengthened

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 4.1.2: Building institutional and project capacity in Monitoring and Evaluation, Environmental and Social Safeguards and Gender

Status

Activity started - progress delayed

Implementation Progress

15 %

Progress for the relevant reporting period

The Project will be reviewing the ESM Plan in 2021 following the approval by the GCF on the FAA conditions, and a revision of workplans with detailed information on the implementation of activities e.g. sector case studies (this level of detail was not available under the original ESS assessment).

The Project has continued to communicate with LORTA regarding the impact evaluation methodology, however, following the recent decision for the Project to fund any such evaluations, it has been agreed the Project needs to consider this methodology in-line with its overall monitoring and evaluation requirements. To this end, a Monitoring and Evaluation Framework and Plan will be developed which will consider the best way forward for the Project to meet all of the monitoring and evaluation requirements. A terms of reference has been completed and it is expected the procurement for an M&E specialist to work with the project team will be undertaken in September / October.

The Gender Assessment was completed in early 2020. The Assessment will guide next steps in developing a revised Gender Action Plan (GAP). However, due to COVID-19 impacts, this has been delayed. Plans are in place to source in-country support to undertake the field component in the first half of 2021, with the results to feed into the draft Action Plan.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Review the ESM Plan and upgrade as required. Conduct training in ESS monitoring and reporting.
Milestone #2: Finalise the Gender Strategy and Action Plan and undertake training of project personnel in implementation, monitoring and reporting.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 4.2. Training of personnel leads to strengthening of institutional capacity

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 4.2.1: Training packages building knowledge and skills in meteorology and climate tools

Status

Activity started - progress delayed

Implementation Progress

5 %

Progress for the relevant reporting period

A training needs analysis (TNA) was conducted in October 2019 to establish: (i) gaps in knowledge and skills – noting relevant professional competencies required by VMGD personnel; (b) what training is required, and; (c) identification of recipients for the training and mentoring programmes.

The assessment focused on formal and informal (on-the-job) training, and mentoring and secondment trainings. The TNA report outlines a number of prioritised trainings for VMGD staff. These training needs range from technical meteorological / climate training to upskilling the technical staff. In addition, project management training was highlighted as a significant gap.

Following the submission of the Assessment Report, training opportunities, packages etc will be identified and developed as appropriate with the training programme to be developed and completed for implementation commencing in 2021.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Develop training programme

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 4.2. Training of personnel leads to strengthening of institutional capacity

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 4.2.2: Establishing a mentoring programme to strengthen capacity and knowledge

Status

Activity started - progress on track

Implementation Progress

5 %

Progress for the relevant reporting period

Whilst the formal mentoring programme is yet to be developed and implemented, mentoring and building the capacity of project team members has commenced through on-going interactions between the Implementing Entity and the project team on project management, workplanning and budgeting and effective roll-out of activities,. Additionally, the technical partners (APCC, BOM, CSIRO) have also continued to provide ongoing support through their respective activites (refer to the above activity updates).

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

Milestone #1: Develop mentoring programme

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

Project Output Name

Output 5.1. Project objectives achieved through effective project management

The output name should match with the output reported in the sub-section 2.4.3. If you have multiple activities to be reported against one output, you need to write down the same output name for every activity.

Project Activity Name

Activity 5.1.1 PMU established and providing overall management and coordination of Project activities

Status

Activity started - progress on track

Implementation Progress

36 %

Progress for the relevant reporting period

The Project has established two project management units (SPREP and VMGD) with five staff. The management arrangements relating to the PMU are under review by the Implementing Entity with discussions to take place in Q4 of 2020 to finalise the best working arrangements for the project i.e. co-location, roles and responsibilities. This is particularly important given the Project Manager vacancy. This position is being filled by the Technical Officer with support from the SPREP Administration / Finance Officer. Given the budgetary constraints the position will continue to be filled by the Technical Officer in the acting capacity. The Implementing Entity's Project Coordination Unit who will continue to build capacity within the PMU's and support the Technical Officer and project team. This includes on-the-job training in project management and financial management, provision of advice and guidance and providing overarching guidance and decision-making on strategic matters as the project moves forward.

The PMUs continue to support the Project throughout the reporting period as a conduit for on-ground activities, providing data collection support and working with Sectors and Delivery Partners to deliver on activities and seek inputs into activities being undertaken remotely. The PMU was instrumental in providing support to NIWA in collecting data and information necessary for the finalisation of the cost-benefit analysis on the radar.

The Administrative and Financial Officer travelled to Apia, Samoa in February to attend the SPREP Induction Course and receive training on SPREP's Financial (TechOne) and Project Management System (PMIS). In that time the COVID-19 state of emergency for Samoa was declared and immediate closure of borders was in place. The unforeseen lockdown and the extension of Samoa's SOE will not allow the officer to return to base of operation in Vanuatu. Daily allowances to support her extended stay will have an impact on the PMU budget. At the time of finalising this report, the Officer has returned to Vanuatu on a repatriation flight, however, there will be a requirement to seek contingency funding to cover the unexpected expenses from the lockdown due to an already constrained project management budget.

A number of project management tools were developed and given to the staff for the management and coordination of the project. Training was conducted by the Acting Manager for the PMU on the use of the following tools. This includes:

(a) Contract Management and Tracking tool
(b) 2021 Events planner and progress tracking tool
(c) Inventory of CIS users and contact details

The Technical Finance Administration (TFA) Officer received training from the IA on the new procurement templates and financial reporting. The TFA officer has provided training and support to the VMGD Finance officer in meeting their financial obligations. This is important to ensure high quality reports are submitted on a timely manner.

The Project Steering Committee (SC) and Technical Working Group (TWG) did not meet during the reporting period due to continued work on finalising GCF disbursement conditions and workplans, and COVID-19 restrictions.

Provide an updated progress on this project activity for the relevant reporting period, including delays and issues encountered, key milestones reached, and lessons learned, including issues related to non-compliance with GCF standards or conditions, vis-à-vis expectations, if any. In parallel, include positive achievements and better-than-expected results.

Key milestones and deliverables for the next reporting period

1. Continued management of the Project and Project activities.
2. Six-month reports.
3. Steering Committee meetings and minutes.
4. Technical Working Group meetings and minutes.
5. M&E Plan developed and implemented.

Please include a list of key milestones and deliverables expected to be executed in the next reporting period.

2.4 Progress Update on the Logic Framework Indicators

Values of Baseline, mid-term target and final targets should be the same from the approved funding proposals unless calculation methodologies were revised in agreements with the GCF. Please attach a supporting document(s) describing the calculation methodology of the current value of all the indicators in Section 6; the indicators cover core, impact, outcome, and output levels. If there is a change in the methodology, you need to include clear justifications for the change and changed values as compared to the previous year.

This sub-section 2.4 is not applicable for REDD+ Results-Based Payments Projects. Please write 'Not Applicable' as the response.

2.4.1 Core Indicators

Select applicable core indicators

- [ ] Mitigation Core Indicator 1 - Tonnes of carbon dioxide equivalent (tCO2eq) reduced as a result of GCF funded project/programme
- [ ] Mitigation Core Indicator 2 - Cost per tCO2eq decreased for GCF funded project/programme
- [ ] Mitigation Core Indicator 3 - Volume of finance leveraged by GCF funding (Disaggregated by public/private source)
- [X] Adaptation Core Indicator 1 - Direct Beneficiaries of GCF funded project/programme
- [X] Adaptation Core Indicator 2 - Indirect Beneficiaries of GCF funded project/programme
- [X] Adaptation Core Indicator 3 - Number of total beneficiaries relative to total population

Adaptation Core Indicator 1 - Direct Beneficiaries of GCF funded project/programme (Units: number of individuals and percentage %)

Please provide ex-post 'Current Value' on a cumulative basis. Please note that the values should be based on total funding (GCF funding and co-financing).

Baseline	**Baseline (% of female)**
0	0 %
Current Value	**Current Value (% of female)**
433	27 %
Mid-term Target	**Mid-term Target (% of female)**
13585	46 %
Final Target	**Final Target (% of female)**
53362	48 %

Remarks (including changes, if any)

Adaptation Core Indicator 2 - Indirect Beneficiaries of GCF funded project/programme (Units: number of individuals and percentage %)

Please provide ex-post 'Current Value' on a cumulative basis. Please note that the values should be based on total funding (GCF funding and co-financing).

Baseline	**Baseline (% of female)**
0	0 %
Current Value	**Current Value (% of female)**
0	0 %
Mid-term Target	**Mid-term Target (% of female)**
68114	49 %
Final Target	**Final Target (% of female)**
272459	49 %

Remarks (including changes, if any)

Activities targeting indirect beneficiaries have yet to commence

Adaptation Core Indicator 3 - Number of total beneficiaries relative to total population (Units: percentage %)

Please provide ex-post 'Current Value' on a cumulative basis. Please note that the values should be based on total funding (GCF funding and co-financing).

Share of direct beneficiaries relative to total population

Baseline	Current Value	Mid-term Target	Final Target
0 %	0.16 %	31 %	72 %

Share of female direct beneficiaries relative to total population

Baseline (female)	Current Value (female)	Mid-term Target (female)	Final Target (female)
0 %	0.04 %	25 %	25 %

Share of indirect beneficiaries relative to total population

Baseline	Current Value	Mid-term Target	Final Target
0 %	0 %	25 %	100 %

Share of female indirect beneficiaries relative to total population

Baseline (female)	Current Value (female)	Mid-term Target (female)	Final Target (female)
0 %	0 %	25 %	100 %

Remarks (including changes, if any)

2.4.2 Impact Indicators

Select applicable impact indicators

- [ ] M1.1 Tonnes of carbon dioxide equivalent (tCO2eq) reduced or avoided as a result of increased low-emission energy access and power generation
- [ ] M2.1 Tonnes of carbon dioxide equivalent (tCO2eq) reduced or avoided as a result of increased access to low-emission transport
- [ ] M3.1 Tonnes of carbon dioxide equivalent (tCO2eq) reduced or avoided as a result of buildings, cities, industries and appliances
- [ ] M4.1 Tonnes of carbon dioxide equivalent (tCO2eq) reduced or avoided as a result of sustainable management of forests and conservation and enhancement of forest carbon stocks
- [X] A1.1 Change in expected losses of lives and economic assets due to the impact of extreme climate-related disasters in the geographic area of the GCF intervention
- [ ] A1.2 Number of males and females benefiting from the adoption of diversified, climate resilient livelihood options (including fisheries, agriculture, tourism, etc.)
- [ ] A1.3 Number of Fund funded projects/programmes that supports effective adaptation to fish stock migration and depletion due to climate change
- [ ] A2.1 Number of males and females benefiting from introduced health measures to respond to climate-sensitive diseases
- [X] A2.2 Number of food secure households (in areas/periods at risk of climate change impacts)
- [ ] A2.3 Number of males and females with year round access to reliable and safe water supply despite climate shocks and stresses
- [ ] A3.1 Number and value of physical assets made more resilient to climate variability and change, considering human benefits (reported where applicable)
- [ ] A4.1 Coverage/scale of ecosystems protected and strengthened in response to climate variability and change
- [ ] A4.2 Value of ecosystem services generated or protected in response to climate change

A1.1 Change in expected losses of lives and economic assets due to the impact of extreme climate-related disasters in the geographic area of the GCF intervention (Units: multiple, as applicable)

Please provide ex-post 'Current Value' on a cumulative basis.

Select Units (as many as possible)

- [X] Persons
- [X] Economic Assets
- [ ] Other

Unit - Persons

Baseline	Current Value	Mid-term Target	Final Target
11	0	0	0

Unit - Economic Assets

Currency: USD

Baseline	Current Value	Mid-term Target	Final Target
144200000	0	0	

Remarks (including changes, if any)

Targets for end of project are:
(a) Up to 50% reduction in cost of loss and damage to agricultural sector at household level and up to 5% reduction in loss of GDP at national economy scale
(b) 50% reduction in cost of loss and damage to tourism sector

A2.2 Number of food secure households (in areas/periods at risk of climate change impacts) (Unit: number of individuals/households, % percentage, select as many as applicable)

Please provide ex-post 'Current Value' on a cumulative basis.

Select applicable units

- [ ] Persons
- [X] Households

Unit - Households

Please provide ex-post 'Current Value' on a cumulative basis.

Baseline	**Baseline (% of female-headed households)**
0	%
Current Value	**Current Value (% of female-headed households)**
0	%
Mid-term Target	**Mid-term Target (% of female-headed households)**
888	%
Final Target	**Final Target (% of female-headed households)**
1777	%

Remarks (including changes, if any)

2.4.3 Project/Programme-level Outcome & Output Indicators

Please provide ex-post 'Current Value' on a cumulative basis. If you have multiple outputs to be reported against one outcome, you need to write down the same outcome name for every output. Likewise, if you have multiple indicators to be reported against one output, you need to write down the same output name and corresponding outcome name for every indicator.

Use 'Add row' button to add multiple outcomes, outputs and/or indicators.

Results Area Type	**Outcome Name**
Please select	

Output Name (under the afore-mentioned outcome)

Please write 'Not Applicable' if the below-mentioned indicator is to be reported directly at the outcome level.

Indicator Name

Unit

Baseline	**Current Value**	**Mid-term Target**	**Final Target**

Remarks (including changes, if any)

2.5 Report on changes during implementation (include actual and expected changes)

The project has undergone revisions to meet Conditions under the FAA, in particular condition 8(c) requesting a revised workplan and budget. These documents, along with a revised logframe, key results framework and theory of change (amongst other documentation) were submitted to the GCF in early March 2020. The revised project documentation not only meet the conditions stipulated in the FAA, but also provide a clearer roadmap for project implementation and illustrate greater integration across activities. Full implementation of the workplan will commence in Q4 onwards following final approval from the GCF and release of the funding tranche (third disbursement).

In addition to the changes to the project workplan and budget, the impacts of COVID-19 will be felt in the forthcoming months due to travel restrictions into Vanuatu. This will place limitations on the technical delivery partners and in-country project personnel to work face-to-face in delivering on the project's objectives. Planning is underway to limit the impacts of COVID-19 on the project with activities to be restructured / phased to enable either desktop work to progress, undertake remote training and mentoring, or support of project activities through other mechanisms (e.g. greater reliance on in-country personnel to undertake activities on behalf of delivery partners). However, it should be noted that these mechanisms are not optimal particularly on the activities whereby the external expertise is greatly needed prior to any on-ground implementation (i.e. Sector case study application). The situation will continue to be assessed and updates provided.

Describe changes to the project during the reporting period. In particular, the report should cover elements such as change of beneficial ownership structure, management changes of the Accredited Entity, policies and other elements relevant for the project, and any other material change that could influence the overall outcome of the project.

2.6 Implementation challenges and lessons learned

Challenge encountered

Delays in approval on key documentation to meet the conditions of the FAA by the GCF has also led to delays in funding disbursements, leading to a halt in on-ground activities.

Further delays were experienced in approval of the 2019 APR. The APR was submitted in early March 2020 however was not approved until October. Given the disbursements rest with approval of the APRs, any lengthy delay in the GCF review and approval is detrimental to ongoing implementation.

Describe the challenge faced during the last twelve (12) months of implementation that may result in a change to the scope and/or timing of the project; please provide a description and how they have impacted the implementation period and final targets.

Challenge type

Operational

Impact on the project implementation

High

Measures adopted

Documentation supporting the meeting of all FAA conditions (except CBA on the radar) was submitted in early March 2020. The IA has responded to continual requests for information or changes to the original conditions.

The APR was submitted on time to the GCF.

Lesson learned and other remarks

The approval process from the GCF has hindered progress in 2020 and led to delays in the disbursement of funds – this has effectively halted the project for six – eight months. There requires a clear approval process and timeline from the donor.

The lengthy approval process was further exacerbated by the delays in reviewing and approving the APR. Given the eight months from submission to approval of the release of the disbursement, this led to the project being halted and no effective implementation of activities able to take place. It also led to Delivery Partners halting their activities and moving their staff onto other projects.

Challenge encountered

Delays to project implementation make it difficult to manage staffing and resourcing with shifting timelines. This also has budgetary implications.

Describe the challenge faced during the last twelve (12) months of implementation that may result in a change to the scope and/or timing of the project; please provide a description and how they have impacted the implementation period and final targets.

Challenge type

Operational

Impact on the project implementation

High

Measures adopted

1. Revised the workplans and budgets in-line with the conditions of the FAA. Workplans are now detailed and align with the project objectives.
2. Work programmes are being updated to take into account delays in approval and funding disbursement, and COVID-19 impacts.
3. Partner staff have been remobilised

Lesson learned and other remarks

1. Require flexibility to adjust work programmes as required, noting that as timeframe of approval has increased, activities under delivery partners and other on-ground activities have had to be halted due to funding constraints.
2. Projects require consistent and quick approval processes.
3. Different methods for funds disbursement are required i.e. should not be linked to approval of APRs if this is going to take lengthy periods.

Challenge encountered

Travel restrictions as a result of COVID-19 has affected IA, Delivery Partner and consultants travel to Vanuatu to undertake activities, supervisory missions etc.

Describe the challenge faced during the last twelve (12) months of implementation that may result in a change to the scope and/or timing of the project; please provide a description and how they have impacted the implementation period and final targets.

Challenge type

Operational

Impact on the project implementation

High

Measures adopted

1. PMU leading on data and information collection on behalf of consultants and delivery partners.
2. Planning for implementation of activities is being undertaken to take into account of travel restrictions, what can be done remotely etc.
3. Support (i.e Vanuatu personnel) to undertake on-ground actions on behalf of consultants (e.g gender stakeholder consultations) and delivery partners is being explored.
4. Activities such as training on data quality management and data rescue (originally scheduled for May) could not be conducted due to international travel restrictions. Virtual trainings and mentoring in data collection are being explored.

Lesson learned and other remarks

1. The situation with the COVID-19 pandemic has affected travel globally and despite considerations of risks in the risk management plan, the type of challenges being experienced currently were not known, particularly the length of time and the impact it has.
2. Capacity building of local partners for the necessary technical aspects should be prioritized in the initial stage of project to minimize the impact from this unexpected travel ban due to crisises.

Challenge encountered

Inexperienced executing entities / project management units has led to challenges with on-ground implementation

Describe the challenge faced during the last twelve (12) months of implementation that may result in a change to the scope and/or timing of the project; please provide a description and how they have impacted the implementation period and final targets.

Challenge type

Operational

Impact on the project implementation

High

Measures adopted

The IA has held numerous discussions with the Executing Entities to move the project forward and put in place effective project management arrangements. Some of the planned mitigation actions have not come to fruition and therefore seeking other solutions.

Lesson learned and other remarks

There is a need to properly assess the capacity of executing entities and to ensure the project management unit is composed of suitable and experienced personnel.

Challenge encountered

A lack of experience in financial management (budgeting, reconciling, reporting) leading to lengthy delays in receipt of satisfactory information and reports.

Describe the challenge faced during the last twelve (12) months of implementation that may result in a change to the scope and/or timing of the project; please provide a description and how they have impacted the implementation period and final targets.

Challenge type

Financial

Impact on the project implementation

Minor/Solved

Measures adopted

The Implementing Entity has revised all reporting templates and provided extensive training on financial requirements (which is continuing through life-of-project). The training has led to improved understanding of requirements and reporting.

Lesson learned and other remarks

1. Experienced project management personnel are essential for effective on-ground implementation and reporting.
2. Capacity can be limited and additional resources and time is required to train and mentor project personnel to bring up the level of skills needed to undertake project management.

Challenge encountered

VMGD's technical capacity on project management, upgrading and improving meteorological operations and CIS is limited.

Describe the challenge faced during the last twelve (12) months of implementation that may result in a change to the scope and/or timing of the project; please provide a description and how they have impacted the implementation period and final targets.

Challenge type	Impact on the project implementation
Operational	Moderate

Measures adopted

1. The project review recommended the two PMUs from the executing entity partners SPREP and VMGD merge into a single unit to lead the project.
2. SPREP recognises the real need to build the capacity of VMGD and parts of the Government of Vanuatu to strengthen both implementation and sustainability of project. The international delivery partners (CSIRO, BoM and APCC) play a critical role and have within their workplans training and mentoring for project sector and vmgd staff. The planned review also will seek sought to improve the coordination of training and workshops for sector and vmgd staff to maximise impact, reach and for greater operational efficiency.
3. International consultants to be procured during the lifetime of the project will also be requested to include a local consultant, further building capacity in Vanuatu and retention of skills and knowledge.
4. SPREP will also have a greater hands-on mentoring role to support VMGD particularly with managing the project as well as providing technical assistance with climate change and meteorology services.

Lesson learned and other remarks

1. Experienced project management personnel appointed to the Executing Entities is critical to successful execution of projects.
2. A single PMU for the project rather than split PMUs (SPREP and VMGD) would have been a more effective arrangement. The project needs a manager with strong project management experience to not only coordinate and track progress but to also direct and lead at all levels of the project.
3. Partnerships and managing relationships are critical to the success of a project and face-to-face engagements seem to be most effective.
4. People also learn and operate at different speeds and in different ways, so it is important to recognise this if the intention is to also empower the country to have ownership, lead and carry on the interventions post project.

Confirmation and Acknowledgement of Information *

* This is a required question to submit section 2 of the Annual Performance Report (APR).

[X] The accredited entity hereby confirms that the information provided in section 2 is complete and ready for submission.

Section 3: Financial Information

Section 3: Financial Information

Please note that this is section 3 of the six Annual Performance Report (APR) sections. APR will be considered valid only after all the six sections and the additional section on COVID-19 are filled with relevant details.

3.1 Approved Budget for entire project period as per FAA

Currency

usd

(Information is locked for editing)

GCF Funding (Equity)

GCF Funding (Grants)

18 106 905

(Information is locked for editing)

GCF Funding (Guarantees)

GCF Funding (In-kind)

GCF Funding (Loans)

GCF Funding (Results-Based Payment)

3.1.1 Total GCF Funding

18 106 905

(Information is locked for editing)

Please confirm if the afore-mentioned values are different as per your knowledge.

No differences to be reported.

3.2 Co-financing

Currency

usd

(Information is locked for editing)

Co-financing (Equity)

Co-financing (Grants)

3 682 000

(Information is locked for editing)

Co-financing (Guarantees)

Co-financing (In-kind)

Co-financing (Loans)

Co-financing (Results-Based Payment)

3.2.1 Total Co-financing

3 682 000

(Information is locked for editing)

Please confirm the afore-mentioned values are different as per your knowledge.

Yes, there are some differences.

Please explain the differences.

The Project budget was revised in 2019 (submitted in early 2020) as part of the FAA conditions. The revised budget was approved by the GCF with a revised co-financing amount of USD 1,746,992.

3.3 Disbursements Details (Cumulative to this reporting period)

3.3.1 Total GCF Disbursement

5 083 398

(Information is locked for editing)

Currency

usd

(Information is locked for editing)

GCF Equity Disbursement

GCF Grants Disbursement

5 083 398

(Information is locked for editing)

GCF Guarantees Disbursement

GCF In-kind Disbursement

GCF Loans Disbursement

GCF Results-Based Payment Disbursement

Please confirm the afore-mentioned values are different as per your knowledge.

No differences to be reported.

3.3.2 Co-Financing Disbursement

644 950.64

Provide the cumulative amount of disbursements from the start of implementation to the end of this reporting period. Indicate '0' if no amount is disbursed yet.

Choose currency

USD

3.3.3 Total Project Disbursement

5 728 313.64

Provide the cumulative amount of disbursements from the start of implementation to the end of this reporting period. Indicate '0' if no amount is disbursed yet.

Choose currency

USD

Please provide comments on sub-section 3.3, if any.

3.4 Expenditure details (Cumulative to this reporting period)

Choose currency

Please select

GCF Equity Expenditures

Provide the cumulative amount of expenditures from the start of implementation to the end of this reporting period. Indicate '0' if no amount is disbursed yet.

GCF Grants Expenditures

2 449 356.80

Provide the cumulative amount of expenditures from the start of implementation to the end of this reporting period. Indicate '0' if no amount is disbursed yet.

GCF Guarantees Expenditures

0

Provide the cumulative amount of expenditures from the start of implementation to the end of this reporting period. Indicate '0' if no amount is disbursed yet.

GCF Loans Expenditures

Provide the cumulative amount of expenditures from the start of implementation to the end of this reporting period. Indicate '0' if no amount is disbursed yet.

3.4.1 GCF Expenditures

3 899 807.90

Provide the cumulative amount of expenditures from the start of implementation to the end of this reporting period. Indicate '0' if no amount is disbursed yet.

3.4.2 Co-financing Expenditures

644 950.64

Provide the cumulative amount of expenditures from the start of implementation to the end of this reporting period. Indicate '0' if no amount is disbursed yet.

3.4.3 Total Project Expenditures

4544758.54

Please provide comments on sub-section 3.4, if any.

Under the "GCF Grants Expenditure" this figure denotes the reported expenditure from the EEs against the funds disbursed to them. The figure under "GCF Expenditure" denotes the amount of funds disbursed from the IA to the EEs.

3.5 Investment & Other Income (Cumulative to this reporting period)

Reporting Level for investment

Please select the second option 'Accredited Entity Portfolio Level' only if AEs have more than one project where all GCF funds are held in a consolidated GCF Special Account.

Choose currency

Please select

- [ ] Project Level
- [ ] Accredited Entity Portfolio Level

Please provide comments on sub-section 3.5, if any.

3.6 Report on AE fees (Cumulative to this reporting period)

Reporting Level for AE fees

Please select the second option 'Accredited Entity Portfolio Level' only if AEs have more than one project where all GCF funds are held in a consolidated GCF Special Account.

Choose currency

USD

- [x] Project Level
- [ ] Accredited Entity Portfolio Level

Project Level AE Fees

457 505.82

Please provide comments on sub-section 3.6, if any.

3.7 Annual Financial Performance Report

Please download the Financial Performance Report Template in Excel.

Financial Performance Report Template

This sub-section 3.7 is not applicable for REDD+ Results-Based Payments Projects. Please provide a separate 'Financial Progress Details' in Section 6.

Please attach the Annual Financial Performance Report here.

210803_FP035 Van KIRAP_Year 2_2020_IA Financial Report.xlsx

Please provide comments on the attachment.

The financial report has been updated reflective of the reviewers comments. Changes include: (1) Budget column has been updated to ensure it matches approved budget of US$18,106,905 and; (2) Othr Mngt Costs has been removed and the expenditure incorporated into the salary line reflective of the cost i.e. this referred to salary and has been approved under the budget.

Confirmation and Acknowledgement of Information *

* This is a required question to submit section 3 of the Annual Performance Report (APR).

[X] The accredited entity hereby confirms that the information provided in section 3 is complete and ready for submission.

Section 4: Environmental and Social Safeguards & Gender

Section 4: Environmental and Social Safeguards & Gender

Please note that this is section 4 of the six Annual Performance Report (APR) sections. APR will be considered valid only after all the six sections and the additional section on COVID-19 are filled with relevant details.

4.1 Implementation of environmental and social safeguards and gender elements

Please provide information on the project or programme on the following: (1) key risks and impacts as identified; (ii) compliance with applicable laws and regulations including FAA conditions and covenants; and (3) progress in the implementation of environmental and social management plans and programs including monitoring activities undertaken during the implementation of the funded activity.

4.1.1 The information includes description on any changes in the key environmental and social risks and impacts as identified and arising from the implementation including any unanticipated risks and impacts (ex. from changes in laws and regulations) and, based on these if any change in the project's environmental and social risk category. In case of a change in the E&S risk category for the project, please provide an explanation.

The 2019 update to the original ESM Plan highlighted the following: "At project approval, the project was categorised as C, i.e. with minimal environmental and social implications. During implementation, however, some specific environmental and social issues may need extra attention." An addendum to the original ESM Plan was provided in 2019 and highlighted these areas as:

- equipment procurement and installation,
- climate centres,
- sector case studies;
- social management and gender action plan;
- project management unit office management

Due to funding delays in 2020, the ESM Plan was not reviewed and updated. This will be undertaken in 2021 and will also include a report on mitigation actions undertaken by the Executing Entities against the highlighted risks.

4.1.2 The information should include status of compliance with applicable laws and regulations of the country as well as the relevant conditions or covenants under the FAA. This can be captured in the table below:

Status of compliance with applicable laws and regulations and the conditions and covenants specifically addressing ESS & Gender under FAA

Compliance Type

Condition

Compliance Title & Description

FAA Clause 9.02(c): Continuously screen and monitor environmental and social risks and impacts arising from the Funded Activity using the risk screening process described in the Environmental and Social Screening Summary that was provided by the Accredited Entity as an annex to the Funding Proposal, as set out in Annex 2 to this Agreement

Status of compliance

The Executing Entities in implementing the Project on-ground monitor and report against any possible environmental and social risk which may arise from the implementation of activities. These are reported on a six-monthly basis to the IA. To-date there have been no new risks identified beyond those identified in the 2019 ESMP review.

Compliance Type

Condition

Compliance Title & Description

FAA Clause 9.02(d): Acquire, or ensure that the Executing Entity shall acquire, all land and rights in respect of land that are required to carry out the Funded Activity and shall promptly furnish to the GCF, upon its request, evidence satisfactory to the GCF that such land and rights in respect of the land are available for the purposes of the Funded Activity

Status of compliance

The Executing Entity (VMGD) complies with Vanuatu Government legislation in respect to rights of land when seeking landowners permission for use of land for the installation of equipment related to the Project activities. Details of this is outlined under the progress against each of the relevant activities. VMGD has sought and has evidence of landowners permissions.

4.1.3 Provide a report on the progress made in implementing environmental and social management plans (ESMPs) and frameworks (ESMFs) describing achievements, and specifying details outlined in the tables below.

Implementation of ESMPs and ESMFs

Activities implemented during the reporting period, including monitoring

Activities implemented during the reporting period (noting delays in project implementation) include the Implementation and monitoring of the findings of the 2019 ESM review. This has included focusing on the following:
a. Procurement of equipment: consideration of equipment specifications including a focus on environmental considerations, longevity, repairability and weather resistance where appropriate.
b. Site access: the project team have undertaken discussions with landowners on access to land to install equipment and have followed ESS guidelines and Government of Vanuatu legislation in seeking the relevant approvals.

Outputs during the reporting period

Outputs from the above include: (1) equipment specifications and relevant internal approvals, and (2) documentation on land access.

Key environmental, social and gender issues, risks and impacts addressed during implementation

There were no key ESS issues or risks addressed during the reporting period beyond those outlined above. For gender issues, the Project has ensured there have been opportunities for inputs and feedback from all social groups. Due to delays in implementation in 2020 there was minimal stakeholder engagement at the site level, however, where this was undertaken, the Project personnel took measures to ensure inputs were gathered from all stakeholders.

Any pending key environmental, social and gender issues needing accredited entity's actions and GCF attention

There are no issues highlighted at this stage, however, the AE recognises the need to develop a complete ESM Plan and ensure the Executing Entities are trained and implement the mitigation actions as part of the activity implementation. This will be undertaken in 2021.

4.1.4 Provide information on how the GCF Independent Redress Mechanism, as well as the AE's GRM (e.g. contact details, accessibility, and basic procedures of such mechanisms), is brought to the attention of executing entities, people, and beneficiaries in the project target area and the public in accordance with the relevant ESMS/ESIA.

The Executing Entities were provided with Environmental and Social Safeguards training in 2019 as part of the ESS review. At the time, they were informed of the AEs Grievance Redress Mechanism and of the GCF's requirements and their Independent Redress Mechanism. The Project's GRM operates in-line with the Government of Vanuatu's complaints mechanism, particularly for communities. It is noted further ESS training will need to be provided to the project personnel including on the GRM and to ensure appropriate redress mechanisms are in place at the community level particularly as the project activities are now under full implementation. This will take place in Q4 of 2021 as part of the ESM upgrade.

4.1.5 Include a description of the actions undertaken towards increasing the relevant stakeholders' engagement in the project environmental, social and gender elements.

The information in this subsection should be provided for all projects regardless of the E&S risk category for the project.

Implementation of the stakeholder engagement plan

Activities implemented during the reporting period

Not applicable at this stage due to delays in the project implementation.
With the recruitment of the Community Coordinator and Communication Coordinator, stakeholder engagement plans will be developed as part of the particular Strategies and Action Plans. Likewise, the revised Gender Strategy and Action Plan will also include aspects to be built into the stakeholder engagement plan(s).

Dates and venues of engagement activities

Information shared with stakeholders

Outputs including issues addressed during the reporting period

4.1.6 Implementation of the grievance redress mechanism - list on the grievances received in the reporting period with the description of the grievance, the date the grievance was received, and the resolution of the grievance.

Description of issues/complaints received during the reporting period	Date of receipt
There have been no grievances reported during the reporting period.	

Description of resolution	Status of addressing issues/complaints

4.2 Gender Action Plan

The Gender Action Plan is undergoing review as of 2020. Due to COVID-19 restrictions on travel to Vanuatu, the further development of the Strategy and Action Plan has been delayed. However, plans are now in place whereby the consultant has contracted in-country gender specialists to undertake the stakeholder consultations which will provide the important inputs into the development of the strategy and plan. It is expected the consultations will commence in April with a draft to be provided around mid-year.

Provide a progress report on the gender action plan developed during project preparation stage for the reporting period. This will primarily be a report on activities undertaken and results achieved as a result of completion of an activity. Further it should also indicate if the project is on track to achieving the intended outcome(s). The reporting should be done for activities, targets and indicators already set in the action plan including on vulnerable groups (youth, poor, female heads of households, etc.) as would have been identified in the gender analysis and action plan. If activities or targets are not achieved as per plan, reasons should be provided, and recourse action should be proposed. Please include a reporting on any changes or deviations. Include a Report on implementation challenges and lessons learnt and how these will inform on-going actions and what action will be taken by when to address the challenges faced. Incorporate both quantitative data and qualitative report of the performance of such actions, and on progress on actions identified.

4.2.1 Progress on implementing the project-level gender action plan submitted with the funding proposal

Activity / Action

Output 2.1: CIS implemented within target sectors

Indicator

• Extent to which gender is recognized in sector specific action plans and policies delivered by the project
• Extent to which key Sector stakeholders recognize gender based CIS need

Baseline

0

Target, including sex-disaggregation

• Womens' equal participation in sector engagement
• Gender inclusion recognised in new policies supported/delivered by the project

Budget

0

Currency

USD

Report on annual progress

GAP is undergoing a review. All activities have gender implicit within their activities and budget.

Activity / Action

Participation of women in project related activities.

Indicator

• Aim for 50% of project positions to be filled by women
• Evidence of gender issues being monitored and directed by governance mechanisms

Baseline

0

Target, including sex-disaggregation

50% of project positions filled by women

GAP being reviewed and gender included in ESMP, to be monitored annually

Budget

0

Currency

USD

Report on annual progress

GAP is undergoing a review. All activities have gender implicit within their activities and budget.

4.3 Planned activities on environmental and social safeguards for the next reporting period

1. The project does not have a specific ESM Plan per se as the original categorisation was a 'C' and no plan was developed. A review in 2019 highlighted areas of focus noting the Sector Case Studies were not complete at that stage and these would require an ESS review. Funding delays and a halt to project activities in 2020 has delayed the review and upgrade of the ESM. This is now planned for Q3 and Q4 of 2021.
2. Procurement: Specifications of all equipment to include environmental considerations, as well as issues of longevity, repairability, and weather resistance.
3. Installation of equipment: installation to consider local customs and local labour.
4. Establishment of climate centres: consideration to be given to 'fit for purpose' and use of recycle materials to minimise waste.

Provide a list of activities in the ESMP to be implemented in the next reporting period. Include relevant deliverables such as reports or action plans, and other project specific products. Please include the monitoring schedule concerning ESS (including other potential vulnerable groups and indigenous people) for the next annual reporting period.

4.4 Planned activities on gender elements for the next reporting period

1. Final Gender Strategy and Action Plan developed.
2. Gender Action Plan has commenced implementation.

Provide a list of activities in the gender action plan to be implemented in the next reporting period. Include relevant deliverables such as reports or action plans, and other project specific products including processes that will be involved to implement the activities effectively. Please include the monitoring schedule concerning gender activities for the next annual reporting period. Report on actions taken on any of the recommendations made by the secretariat (if applicable) to improve the level of integration of gender issues in the project.

Confirmation and Acknowledgement of Information *

* This is a required question to submit section 4 of the Annual Performance Report (APR).

[X] The accredited entity hereby confirms that the information provided in section 4 is complete and ready for submission.

Section 5: Annexes

Section 5: Annexes

Please note that this is section 5 of the six Annual Performance Report (APR) sections. APR will be considered valid only after all the six sections and the additional section on COVID-19 are filled with relevant details.

Annex 1: Updated implementation timetable for the Funded Activity

210226_Implementation Timetable_VANKIRAP.xlsx

Submit only if there are any changes from implementation plan submitted in the FAA.

Annex 2: Accredited Entity compliance reports

200311_Final_SPREP_GCF AE Mid-term Accreditation Review.docx

Self-assessment reports, Report on Actions pursuant to Clause 18.02, if applicable. Self-assessment reports: In accordance with the AMA requirement in Clause 13.01 of the Accreditation Master Agreement, with the Fiduciary Principles and Standards, ESS and Gender Policy. Report on Actions pursuant to Clause 18.02: Only applicable to International Accredited Entities. In accordance with the Monitoring and Accountability Framework, a report on its actions carried out or planned to be carried out pursuant to Clause 18.02 of the Accreditation Master Agreement.

Please provide comments on the annexes attached above if any.

SPREP submitted in early January 2021, its re-accreditation application as per the requirements under the AMA.

Confirmation and Acknowledgement of Information *

* This is a required question to submit section 5 of the Annual Performance Report (APR).

[X] The accredited entity hereby confirms that the information provided in section 5 is complete and ready for submission.

Section 6: Attachments

Section 6: Attachments

Please note that this is section 6 of the six Annual Performance Report (APR) sections. APR will be considered valid only after all the six sections and the additional section on COVID-19 are filled with relevant details.

Click on '+ Add row' to attach more than one document.

210326_FP035 Van KIRAP_Year 2_2020_IA Financial Report.xlsx

Annex 1_Progress on Logic Framework indicators.docx

Submit the Unaudited/Audited financial statement and Interim/Final evaluation report (as required by FAA). Submit a supporting document for Section 2.4. (Update Progress on the Logic Framework Indicators), describing the calculation methodology for the current values provided.

This sub-section 2.4 is not applicable for REDD+ Results-Based Payments Projects.

Other Attachments (if any). Such as additional budget-related information, loan repayment schedules to GCF (interest/principal), equity investment schedules, other related reports relevant to the Funded Activity, statements of capital account, valuation reports, credit guarantee agreements, investor reports, and others, as specified in the relevant legal agreements (e.g. Funded Activity Agreement, Shareholders Agreement)

For the Annual Performance Report of REDD+ Results-Based Payments projects, provide 'Implementation Timetable/Milestones for the next reporting period' and 'Financial Progress Details' as an attachment in this section.

Comments from AE (if any)

Confirmation and Acknowledgement of Information *

* This is a required question to submit section 6 of the Annual Performance Report (APR).

[X] The accredited entity hereby confirms that the information provided in section 6 is complete and ready for submission.

Additional Section: COVID-19 Impact

Additional Section: COVID-19 Impact

In this additional section of the Annual Performance Report (APR), please provide an update of COVID-19 impact on your project/programme. APR will be considered valid only after all the six sections and the additional section on COVID-19 are filled with relevant details.

Please indicate if your project/programme is adversely impacted by the COVID-19 pandemic.

Yes

Please choose the severity of overall impact.

Facing delays

Description of levels of severity:
1. On-track with no or minor impact: No or minor impact on project implementation and corresponding annual activities.
2. Facing delays: Implementation progress faced delays in the timeline but did not require any substantial changes in the implementation plan.
3. A minor change(s) required: Changes that are not classified as Major changes but requires intervention from GCF.
4. A major change(s) required: As per paragraph 16 of the Policy on Restructuring and Cancellation - Board Decision B.22/14 paragraph (a). Please find the link to the policy document below.

GCF Policy on Restructuring and Cancellation

Please describe an overall impact on your project/programme by the COVID-19 pandemic (100-word limit).

The Pacific region has been in 'lockdown' mode since early 2020, whereby borders have been closed to all travel except for repatriation flights. This has led to the inability of the IA and the external delivery partners, who are leading on the technical aspects of the project, to enter Vanuatu to undertake on-ground activity. Whilst the delivery partners have continued to work on the project remotely, a critical juncture is being reached as on-ground consultations, testing and application as well as working with the Vanuatu-based project team is now required.

Provide a short description of the adverse impact on your project/programme and provide references or supporting materials in the Annexes and Attachments sections as relevant.

Please describe details of challenges encountered and corrective/mitigation measures taken.

Select a type of the challenges encountered.

Field Activities

Describe details of the challenge encountered.

Challenges have included:
- No access to Vanuatu by external project personnel. Initially, travel was also restricted internally however this has been lifted.
- Lack of coordination and integration across project activities.
- Delays in travel and field work, workshops, trainings etc
- Inability to visit Vanuatu to fix damaged equipment, thus leading to no data received for 12 months from the AWS (technical skills to fix the equipment do not reside within Vanuatu).
- Delays in implementation of project activities.

Sample challenges for Field Activities:
- Delays in travels, planned training, workshops, conferences, events, and awareness-raising events
- Limited access to project sites especially outer islands
- Postponed field missions for collecting/validating information, and conducting consultations with local stakeholders
- Measures required to ensure the security and safety of workers
- Delays in pilot projects, feasibility/baseline studies

Describe details of the corrective/mitigation measures taken as much as you can.

Mitigation actions have included:
1. Virtual workshops, meetings and trainings where possible.
2. Increased management and oversight of the IA on the project to attempt to increase coordination and integration efforts.

Please describe if any support is required from the GCF to address the COVID-19 impact on your project/programme.

The continuing issue of COVID will be a 'watching brief' as it remains unclear as to when travel restrictions will be lifted. If restrictions continue there may need to be some decisions made in mid-year (post mid-term review) as to future implications on the project i.e. suspension of the project, reduction in activity etc.

Confirmation and Acknowledgement of Information *

* This is a required question to submit the additionla section of the Annual Performance Report (APR).

[X] The accredited entity hereby confirms that the information provided in the additional section on COVID-19 is complete and ready for submission.