



**GREEN
CLIMATE
FUND**

Meeting of the Board
8 – 10 March 2016
Songdo, Incheon, Republic of Korea
Provisional agenda item 19 (a)

GCF/B.12/Inf.06/Add.01

3 March 2016

Progress and outlook report of the Readiness and Preparatory Support Programme – Addendum Readiness proposals

Summary

This addendum contains the following two readiness proposals:

- (a) Readiness support for pipeline development in Vanuatu; and
- (b) Readiness support for pipeline development in Senegal.

These documents are presented as submitted by the national designated authority/focal point and their delivery partners.

Table of Contents

| | | |
|-----------|--|----|
| I. | Executive summary | 1 |
| 1.1 | Readiness proposal for pipeline development in Vanuatu | 1 |
| 1.2 | Readiness proposal for pipeline development in Senegal | 1 |
| Annex I: | Readiness support in pipeline development in Vanuatu | 3 |
| Annex II: | Readiness support in pipeline development in Vanuatu | 36 |

I. Executive summary

1.1 Readiness proposal for pipeline development in Vanuatu

1. Vanuatu faces key climate risks, including increasing air and sea surface temperature, rising sea levels, changes in the frequency and intensity of tropical cyclones, extreme rainfall, drought, ocean acidification and coral bleaching. Therefore, access to credible, science-based Climate Information Services (CIS) to inform all aspects of policy, planning and associated decision-making for climate adaptation and disaster risk reduction purposes is a crucial requirement at the local, regional, and national level. As such, Vanuatu requests readiness support from GCF to determine the CIS needs of policy developers, planners, and decision makers to complete a funding proposal prepared by the Secretariat of the Pacific Regional Environment Programme (SPREP), a GCF direct access entity.
2. The proposed readiness support includes the following three key activity components:
 - (a) Targeted in-country consultation with key stakeholders, focusing on climate adaptation policy makers, planners and community level decision-makers, to identify CIS needs and associated capacity gaps;
 - (b) Analysis of lessons learned from recently completed and ongoing CIS-related programs/projects in the western Pacific; and
 - (c) Design of an assessment framework and baseline conditions for undertaking CIS socio-economic Cost-Benefit Analysis as well as monitoring and evaluation (M&E) for CIS applications in the western tropical Pacific.
3. This readiness proposal has been developed following the Secretariat's second-level due diligence of a funding proposal submitted by the SPREP with a no-objection letter from the national designated authority (NDA) of Vanuatu, the Ministry of Climate Change Adaptation, Meteorology, Geo-hazards, Environment and Energy. The Secretariat identified that the full funding proposal could be strengthened by undertaking the activities listed above and benefit from the Readiness and Preparatory Support Programme. The NDA of Vanuatu supported and agreed to this approach. Upon completion, the SPREP expects to re-submit to the GCF a full funding proposal incorporating the outcomes of the proposed readiness request.
4. The total expected cost for the readiness support is USD 157,316, of which GCF is requested to finance USD 137,316.
5. The full proposal of Vanuatu's readiness support request is provided in Annex I.

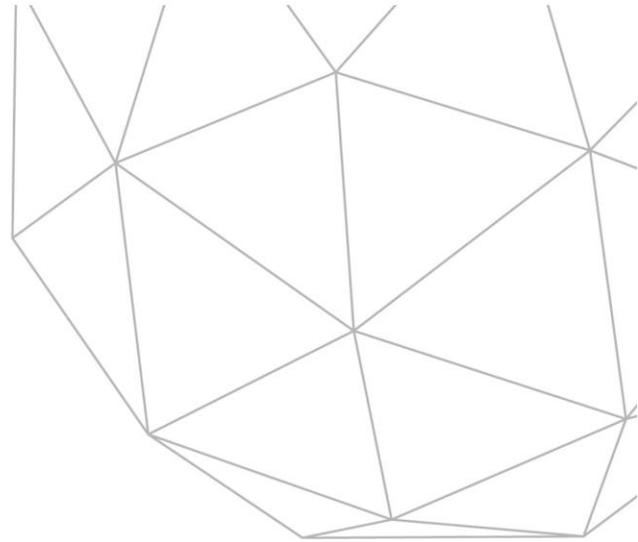
1.2 Readiness proposal for pipeline development in Senegal

6. Senegal is experiencing an acute energy crisis, which is hampering its growth and impeding its development. Société Nationale d'électricité du Sénégal, the state owned utility, faces enormous challenges to find the investment capital needed to expand electricity production, and is seeking to partner with the private sector to address the country's needs. The private sector has not been an active player in the renewable energy sector in Senegal and the existing independent power producers (IPP) typically use thermal power plants. The Government of Senegal wants to develop solar energy projects throughout the country and requested the GCF to provide readiness support through the International Finance Corporation (IFC) to build a pipeline of private sector operated solar projects. The proposed activity is well-aligned with the country's priorities and will be supported by the Government of Senegal during implementation.

7. Expected outputs from this joint GCF-IFC readiness support include a comprehensive mapping of solar resources throughout the country as well as a technical and economic feasibility analysis of possible project sites. A technical analysis on the grid integration of electricity generated from renewable sources will also be carried out. Additionally, there will be a review of the institutional, legal and regulatory framework for privately owned, renewable electricity production. Upon completion of these activities, a Request for Proposal process will be launched for one or more IPP licences. The main objective of these activities is to develop competitive, privately funded, grid connected solar project(s) within the two years. The total expected cost for these readiness activities is USD 2,531,799, of which GCF is requested to finance USD 600,000, the rest being supported by the IFC.
8. This readiness proposal has been developed by the Ministry of Environment and Sustainable Development of Senegal, the GCF focal point for the country, with the support of the IFC. The focal point held a coordination meeting with relevant ministries, including the Ministry of Energy, to get feedback on the readiness proposal to ensure that it is in line with the priorities of the Government of Senegal.
9. The full proposal of Senegal's readiness support request is provided in Annex II.

Annex I: Readiness support in pipeline development in Vanuatu

READINESS | 2015



Readiness and Preparatory Support Proposal

Activity Area 4 | Pipeline Development



| A. Executive Summary <i>(in one page)</i> | |
|---|--|
| Country (or region) | Vanuatu |
| Submission Date | 26/10/2015 |
| NDA or Focal Point | Ministry of Climate Change, Change Adaptation, Meteorology, Geo-Hazards, Environment, Energy and Disaster Management |
| Contact Point <i>(both NDA/FP and delivery partner)</i> | <p><u>NDA:</u> <u>Ministry of Climate Change, Change Adaptation, Meteorology, Geo-Hazards, Environment, Energy and Disaster Management</u> Name: Mr JothamNapat Position: Director-General Email: jnapat@vanuatu.gov.vu Tel: +67824094 Full Office address: PMB 9054, Port Vila, Vanuatu</p> <p><u>Delivery Partner</u> <u>Secretariat of the Pacific Regional Environment Program (SPREP)</u> <u>Project Coordination:</u> Name: Mr Simon Wilson Position: Climate Finance Advisor Email: simonw@sprep.org Tel: +685 21929</p> <p>Name: Dr Netatua Pelesikoti Position: Director, Climate Change Division Email: netatuap@sprep.org Tel: +685 21929</p> |
| Request Summary <i>(in 200 words)</i> | <p>The primary purpose of this Readiness Proposal is to determine the Climate Information and Services (CIS) needs of policy developers, planners, and decision makers in a vulnerable Pacific Island Small Island Developing State (SIDS), Vanuatu. In doing so the Proposal will allow for tailoring of the delivery of climate and weather information and services for the issues and sectors most in need.</p> <p>Information gathered from this Readiness Funding request will allow for the completion of the Full GCF Proposal entitled: Pacific Climate Adaptation Policy and Planning Support through Applied Climate Information Services (Pac CLIM APPS), which aims to develop integrated, fit-for-purpose, climate information to support climate resilient development in Pacific Island Countries.</p> <p>This Readiness Proposal includes the following three key activity components:</p> <ol style="list-style-type: none"> 1. Targeted in-country consultation with key stakeholders, focusing on climate adaptation policy makers, planners and community level decision-makers, to identify CIS needs and associated capacity gaps. 2. Analysis of lessons learned from recently completed and ongoing CIS-related programs/projects in the western Pacific. 3. Design of an assessment framework and baseline conditions for undertaking CIS socio-economic Cost-Benefit Analysis as well as monitoring and evaluation (M&E) for CIS applications in the western tropical Pacific, <p>The proposal will support better understanding of the value, development and integration of CIS for enhanced resilient development planning and decision making.</p> |
| Anticipated Duration | 01/01/2015 – 31/05/2016 (total number of months = 5) |
| Estimated cost | US\$157,316 (Total Readiness Project Cost) US\$137,316 (requested GCF Grant) |

B.1 Readiness Request Description

B.1.1 Background

Understanding and having access to weather forecasts is a part of everyday life for most people these days. It can help us plan our days, weeks, our businesses and decisions. For many climate-vulnerable countries in the Pacific access to the type of climate and weather information they need to plan and make decisions to support livelihoods and business development are limited. Climate Information Services (CIS) refers to fit-for-purpose weather and climate information that can support businesses, policy makers, planners and individuals across a range of sectors, to make better decisions, with more confidence. The need and demand for scientific-based CIS has grown as the global climate has warmed and caused regional and localised variability at rates and extremes not experienced before.

Development of CIS require appropriate engagement with end / next –users, along with development of effective access mechanisms and capacity support. Such services involve high-quality data from national and international databases on temperature, rainfall, wind, ocean conditions and associated extreme events such as drought, deluge, storms and extreme sea level and coral bleaching events. These services typically involve visualised data and information in the form of on-line maps plus risk and vulnerability analyses, assessments, and long-term projections and scenarios and other related tools, products and services. Depending on the user’s needs, these ‘knowledge’ products may be combined with non-meteorological (social, economic and environmental) data, such as agricultural production, health trends, population distributions in high-risk areas, road and infrastructure engineering specifications and maps for the delivery of goods, services and other socio-economic variables. Increasingly, the same can also be said for a range of natural ecosystem services provided by the environment, including various aspects of biodiversity and natural productivity systems.

According to *Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports* (CSIRO and Bureau of Meteorology (2014)) and *Climate in the Pacific: A Regional Summary of New Science and Management Tools* (CSIRO, Bureau of Meteorology and SPREP (2015)), key climate risks for Vanuatu include increasing air and sea surface temperature, increasing sea levels, changes in frequency and intensity of tropical cyclones, extreme rainfall, drought, temperature and sea level events, and increasing ocean acidification and coral bleaching. Therefore, ready access to credible, science-based CIS to inform aspects of policy development, planning and associated decision-making for climate adaptation and disaster risk reduction purposes is a crucial requirement to underpin resilient development at the sectoral, local, sub-national, and national level.

Within the context of national plans and strategies more broadly, the specific requirement for increased access to and use of CIS for decision-making has been identified within the Vanuatu Government’s *National Adaptation Programmes of Action* (NACCC 2007), the *Strategic Development Plan for Vanuatu Meteorological and Geo-hazards Department*, and the *Priorities Action Agenda and the Climate Change Policy*. These documents identify key climate adaptation gaps and needs relevant to enhancing climate preparedness and resilience.

A recent assessment of gaps and needs aligned with national priorities in Vanuatu prepared by SPREP and GIZ¹ identifies key information gaps and needs relevant to addressing key climate risk. More specifically, the assessment looked at the state of knowledge of in-country loss and damage issues identified by sector and relating to extreme and slow onset events in country. Key sectors included fisheries, agriculture and forestry, tourism, water, health, and key risks included ocean acidification and coral bleaching, siltation and erosion, rising air and sea surface temperature, tropical cyclones, drought and flooding, sea level rise, flooding and salt water intrusion. A further report (RMIT and UNHabitat 2015) has recently documented a climate vulnerability assessment for the capital of Vanuatu, Port Vila which found specific risks related to localized flooding, a loss of ecosystem services due to climate change and urbanization, and more broadly sea level rise and ocean acidification.

B.1.2 Activity description (including objectives)

In addition to the initial project planning, establishment of governance and communication arrangements and day-to-day administration, the proposed scope of work activities consists of the following key components:

1. Undertake in-country stakeholder consultation meetings and workshops in Vanuatu. The workshops will be undertaken jointly by SPREP and CSIRO and will involve key sectoral and sub-national community level stakeholders (including private sector representatives, for example from tourism peak bodies). The workshops will be targeted at both national and local scale and stakeholder requirements. The objective of the workshops will be to identify and agree on the end-user’s CIS needs and capacity gap priorities.

¹ Loss and Damage Gap Analysis from Climate Change: Vanuatu Country Report (SPREP GIZ 2015)

Component Output: Completed workshop, and workshop summary report (noting workshop conclusions and recommendations (including on gaps, needs and opportunities) to be integrated into Component 2 below).

2. Incorporate “Lesson’s Learned” from existing CIS projects in the Pacific (and globally where appropriate / relevant) including: descriptions of the scope/scale of recently completed and ongoing projects/programs delivering direct and indirect support for the engagement and integration of ‘climate information services’. The objective of the synthesis report is to understand and present the current baseline with regard to available CIS, and lessons learned with regard to previous (and on-going) CIS programs.

Component Output: Synthesis Report describing scope/scale of recently completed and ongoing projects/programs directly delivering and or supporting uptake and use of ‘climate information services’ in the Pacific region (and globally as relevant / appropriate), with emphasis on remaining gaps and needs and opportunities for strategic alignment with SPREP’s GCF Funding proposal. This synthesis report will also integrate recommendations and conclusions from the workshops of Component 1.

3. Undertake specified work packages for scoping study on cost-benefit analysis². There are presently no standardised frameworks and limited baseline data for undertaking socio-economic cost-benefit analysis (CBA) to measure impact of CIS delivery in the western tropical Pacific. In order to understand and demonstrate the value of CIS in mitigating/avoiding the impacts of climate change, and therefore inform the design and delivery of CIS projects, the objective of this activity is to develop a CBA framework to apply to CIS which can be used in future CIS program design, monitoring and evaluation..

Component Output: The delivery of a cost benefit economic model that can used to determine the Economic Internal Rate of Return and the Economic Net Present Value of CIS projects, including the SPREP’s GCF Full Proposal for CIS.

4. Collate all final reports for key activities/sub-project components, synthesise, analyse and report, including:
 - final ground-truthing of key findings and recommendations with key stakeholders for input to Pac-Clim-APPS GCF Full Proposal
 - Update draft Pac-Clim-APPS GCF Full Proposal incorporating agreed key findings and recommendations from Readiness Project Final Report for submission to GCF Board Meeting in June 2016
 - Undertake final reporting and update GCF Full Proposal

Component Output: Final Report for Pac-Clim-APPS GCF Readiness Project, including key learnings and recommendations for informing GCF Full Proposal. The results of the readiness support, particularly the component 1 stakeholder consultations, will help define the scope and nature (including temporal and geographic scales) of the modelling to be done, and subsequent CIS products.
See [Annex 1](#) – Logical Framework for more details

B.1.3 Justification on request

Climate Information and Services (CIS) are being used around the world to assist vulnerable countries adapt to climate change. As an example of a priority sector in Vanuatu, agriculture is especially vulnerable to climate-related stresses. CIS is being used in many countries throughout the developing world to provide farmers with timely and highly practical information such as immediate and short term weather forecasts and advisories as well as longer term info about new seeds and technologies and market information. CIS is especially useful in helping farmers to manage risks in what is already an exceptionally risky sector in which to operate, and in reducing uncertainty that so often constrains decision making. CIS is designed to inform their decisions about what to grow, when to plant and harvest, how to allocate their labour, and where to sell their produce. Much of this information is specifically adapted for use in local conditions and quickly becomes recognized as being highly relevant to the needs of producers operating in local contexts. One non-specific example of CIS is being used, is in Senegal where it is used to improve seasonal rainfall forecasts thereby helping farmers adapt to climate change and improve their resilience to climate shocks. One of the eight recommended projects for the GCF Board (for the November board meeting) also focuses on, in Malawi, addressing:

“ technical, financial, capacity, and access barriers related to weather and climate information (CI) by investing in enhancing hydro-meteorological capacity for early warnings (EWs) and forecasting, development and dissemination of tailored products including for smallholder farmers and fishers, and strengthening capacities of communities to

²The specific work packages are set out in Annex V: *CBA methodology and description*

respond to climate-related disasters. The objective of the project is to reduce vulnerability to climate change impacts on lives and livelihoods, particularly of women, from extreme weather events and climate change”.

Other relevant sectors where CIS can add value to the planning, implementation and management of assets and services include tourism, infrastructure, urban and community development and others. A key beneficiary of CIS is the Disaster Risk Reduction sector, where CIS forms the critical information component of cross-cutting Climate Early Warning Systems (CLEWS) which are increasingly being prioritised by Pacific Island countries to enhance preparedness for climate extremes. As an example in the Pacific, the Government Independent State of Samoa through the Samoa Meteorology Division and communities have identified the need to develop a Climate Early Warning System (CLEWS) to enable improved access to climate information, improved climate services to vulnerable economical sectors and to build resilience through Disaster Risk Reduction and Climate Change Adaptation inter-linkages, including forestry, health, agriculture, tourism and the marine environment in Samoa (www.samet.gov.ws).

Over longertime-frames, CIS based on multi-decadal climate projections are starting to be used by multi-lateral banks (World Bank, Asian Development Bank) to incorporate long-term climate change sensitivity into large-scale infrastructure financing decisions in the Pacific, **however this needs to be complemented by mainstreaming such CIS into relevant national government decision-making**. As it stands, most new National Adaptation Plans of Action for climate change incorporate the latest climate projections (CSIRO and Bureau of Meteorology 2014), however **the use of relevant CIS for accessing these data has yet to filter down to sectoral planning** as a matter of routine.

This Readiness Proposal will serve to strengthen and provide the basis for completion of a Full GCF Proposal that services the CIS needs and priorities (initially) of Vanuatu³. The Full GCF Proposal has already been developed to a large extent. However, in consultation with the GCF Secretariat it was agreed that further in-country consultation was needed to more explicitly articulate and target end-user CIS needs. Upon completion of this Readiness Project, it is anticipated that SPREP, in collaboration with CSIRO will finalise and submit the full GCF Proposal on behalf Vanuatu.

B.1.4 Implementation arrangements

The Delivery Partner function for this project will be performed by SPREP, a GCF Accredited Implementation Entity, which has the requisite fiduciary and project management track record and capacity to deliver a GCF Readiness Proposal. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is the federal government agency for scientific research in Australia. CSIRO works with leading organisations around the world, covers a broad range of subjects. Employing nearly 5,000 staff, CSIRO maintains more than 50 sites across Australia. The primary roles of CSIRO includes providing new ways to benefit the Australian and global community through research and development. Their expert R&D capabilities of relevance to this Readiness Proposal include various aspects of oceanography and climatology (specifically including earth systems and climate change science), environmental economics and associated communications and knowledge brokering.

Execution of the Readiness Project will be led by SPREP Climate Change Division (SPREP CCD), which is also host to the Pacific Metrologic Desk (and associated CIS expertise), in partnership with CSIRO and key partner country stakeholders. All in-country activities will be coordinated through/with designated GCF NDAs/Focal Points, including engagement with sectoral and community stakeholders. All regional level activities will be coordinated by SPREP Climate Change Division, including with other regional organisations and WMO. Further detail on roles and responsibilities for the delivery of specific activities is provided in the implementation schedule.

The detailed procurement plan is provided in Annex II, inserted below:



Annex
II_Procurement Plan -

³ It is anticipated that this readiness proposal and the subsequent full proposal will serve to establish a model for regional replication and up scaling to ensure CIS mainstreaming across the pacific and through national to local decision makers. Other countries, including PNG and Cook Islands, have expressed interest in being involved in future up-scaling of the CIS development approach

B.2 Risk and Mitigation measures on Readiness Activity

The main focus and objective of this Readiness request is to determine how countries can better use Climate Information and Services in improving the design and implementation of future adaptation projects. Therefore there exist two main risks, namely:

1. Not all the potential needs and policy gaps are identified in this study thereby limiting the potential use of Climate Information and Services (CIS) in future project design and country resource allocation
2. The SPREP GCF Funding Proposal will rely on the results of this Readiness request. Therefore if the GCF Board does not approve the SPREP Climate Information and Services Funding proposal the information obtained in the various stakeholder engagement meetings and the results of the economic analysis will not be used.

A more detailed risk management matrix covering the overall CIS project proposal is attached in [Annex IV](#), for information.

SPREP has over 40 years of experience in working in the Pacific, developing deep and lasting relations with policy makers through the region. The basis of their success has been trusting partnerships they have with Governments. SPREPs experience and relationships in Vanuatu will allow for a frank and open dialogue regarding Country's concerns and Climate Information Services needs. This should greatly limit the possibility of not identifying all potential uses and benefits from improved climate information.

The SPREP Funding Proposal has been reviewed by the GCF M&A team and one element of their feedback was the need for more involvement of stakeholder in the design of the project structure. This Readiness request has been designed to address this concern and improve the Funding proposal's alignment with the Fund's objectives.

The second risk can be also mitigated by disseminating all results and products of the readiness request. Beyond use for developing the funding proposal, results of readiness activity can also be shared with PICS Panel, PMC, WMO GFCS-related activities and other regional and national initiatives as appropriate, as a model of how to approach or develop demand-driven scientific products. Sharing knowledge and learning of practices would add more value to the outputs of the readiness request. Results can also be shared through online publications, and other knowledge products for dissemination. Journal publications for sharing to the global scientific community can also be done.

B.3 Budgeton Readiness Activity

| Category | Activity 1 | Activity 2 | Activity 3 | Activity 4 | Total (USD) | GCF Share (USD) |
|--------------------|------------|------------|------------|------------|----------------|-----------------|
| Consultancy | | 45,000 | 15,000 | 12,500 | 72,500 | 72,500 |
| Travel | 16,560 | 6,500 | | 6,500 | 29,560 | 29,560 |
| Workshop | 23,00 | | | | 23,000 | 23,000 |
| Training | | | | | | |
| Other | | | | | | |
| Operating Cost * | | | | 11,056 | 11,056 | 12,256 |
| Contingency | | | | | | |
| In – kind** | 20,000 | | | | 20,000 | |
| Grand Total | | | | | 151,316 | 137,316 |

* SPREP Project Administration Fee (for providing Delivery Partner services) attributed to Activity 4, but spread across all activities in total

**Salary costs of SPREP and CSIRO staff associated with in-country consultations

A more detailed budget is attached in [Annex II](#)

C.1 Description of Underlying Project/Programme

If available, please provide the following information on the underlying project/programme. It will help assess the alignment of the investment with the Fund's investment and result frameworks. It is understood that this information can be indicative and at the concept stage.

| |
|--|
| <p>C.1.1 Project / programme description (including objectives)</p> |
| <p>The final project will be dependent on the results of this Readiness request. The purpose of this Readiness request being to determine the needs and applicable uses of Climate Information Services in Vanuatu. What is known is that Climate Information & Services are critical tools in many countries throughout the World in helping to adjust and adapt to the realities of climate change. In summary the underlying project i.e.; the <i>Pacific Climate Adaptation Policy and Planning Support through Applied Climate Information Services (PAC CLIM APPS)</i>, aims to develop integrated, fit-for-purpose, climate information for climate resilient development in one (initially) Pacific Island Countries.</p> <p>It is anticipated that upon successful delivery of the Pac CLIM APPS, SPREP CSIRO and other partners will look for opportunities up-scale the approach to a regional, multi-country programme to support climate resilient development across the Pacific.</p> |
| <p>C.1.2 Background information on project/programme sponsor</p> |
| <p>SPREP The Secretariat of the Pacific Regional Environment Programme (SPREP) is an intergovernmental agency that provides assistance and technical advisory services to Pacific Island countries, territories and administrations in the protection and management of their environment to ensure they achieve sustainable development for present and future generations. SPREP's membership comprises 21 Pacific Island countries and territories (including Vanuatu) and 5 developed countries (Australia, New Zealand, France, the United Kingdom of Great Britain and Northern Ireland, and the United States of America). SPREP has a current staff of more than 90, with at least 20 devoted to working full time on climate related issues. SPREP is a regional centre of excellence and the lead Pacific organization in climate change and meteorology work. It has implemented over 100 donor-assisted regional projects in climate change and environmental management, in general, and in CCA and DRR mainstreaming, in particular. SPREP has had long experience in managing regional/multi-country projects, including Global Environment Facility (GEF)-funded and UNDP-supported projects. It has many years of accumulated experience as a GEF executing agency (EA) for several major regional environment projects, particularly on climate change and biodiversity. It has also implemented projects on climate change supported by various donor agencies. SPREP will continue to assist member countries through the provision of technical advice and support. SPREP provides a strict and extensive fiduciary, governance, project management and other organisational performance standards consistent with requisite standards of governance for delivery of donor funded projects and programmes in the Pacific Islands</p> <p>CSIRO also has extensive experience working in other developing countries across the Asia-Pacific region including in SE Asia and Indian Ocean rim countries delivering collaborative, multi-disciplinary and outcome-focused, donor-funded research and development at regional, national and sub-national scale. Key regional donors include the Australian Government and Asian Development Bank, and key regional partners include SPREP, SPC and USP in the Pacific, PAGASSA (Philippines), BMKG (Indonesia), and Ministry of Environment (Vietnam) in SE Asia, Indian Ocean Commission (western Indian ocean SIDS) and the Bureau and WMO across all regions. CSIRO provides dedicated programme management capability to facilitate delivery of best practice governance arrangements to requisite Australian Government standards and associated standard operating procedures relating to day-to-day administration, financial management and reporting, milestone compliance, quality assurance and reporting, work planning and resource allocation, risk management, monitoring and evaluation, stakeholder engagement and communications. Such activities are based on best-practice Occupational Health, Safety and Environment, gender equity and associated non-discriminatory protocols as implemented by CSIRO across its business profile.</p> |
| <p>C.1.3 Market overview</p> |
| <p>Not Applicable</p> |
| <p>C.1.4. Regulation, taxation and insurance</p> |
| <p>Provide details of government licenses, or permits required for implementing and operating the project/programme, the issuing authority, and the date of issue or expected date of issue.</p> <p>Formal permission is required from partner countries (Vanuatu) to access national climate data records. This permission will be sought through existing channels via the SPREP Pacific Meteorological Desk Partnership /Pacific Meteorological Council and Vanuatu Climate Change focal points to access these data as part of the programme inception phase.</p> <p>Describe applicable taxes and foreign exchange regulations.</p> |

Not applicable

Provide details on insurance policies related to project/programme.

Not applicable

C.1.5. Implementation arrangements

Programme governance accountability (for the underlying project, Pac CLIM APPS) will be at direction of the Implementing Entity, SPREP, with on-ground delivery the responsibility of the co-lead executing agencies, SPREP and CSIRO. These two agencies will have joint day-to-day programme management responsibilities with SPREP having primary responsibility for managing and coordinating the GCF and Vanuatu NDA relationship, and for coordinating input of partner executing agencies in the Pacific, including SPC, USP and national government entities in Vanuatu, and the WMO. CSIRO will have primary responsibility for managing and coordinating input of partner executing agencies in Australia and New Zealand, including CSIRO, Bureau of Meteorology, NIWA and other technical service providers as appropriate. A fit-for-purpose governance structure and associated organizational requirements will be developed and implemented as part of the inception phase of the programme.

Describe construction and supervision methodology with key contractual agreements.

All executing partners of the programme will be subject to legally binding terms and conditions of relevant sub-contracts for purpose of delivering products and services as part of the programme and in turn consistent with terms and conditions of the Head Legal Agreement between the GCF and SPREP. In practice, SPREP will manage separate subcontracts with CSIRO and Pacific partners as appropriate. All such subcontracts will be based on existing, heads-of-agreement type templates and subject to fit-for-purpose legal review and validation by all relevant parties to the agreement(s).

C.2 Financing / Cost Information of Underlying Project/Programme

C.2.1 Description of financial elements of the project / programme

Please provide:

- a breakdown of cost estimates analysed according to major cost categories.
- If available and applicable, a financial model that includes projections through the life of the project;
- If available, a description of how the choice of financial instrument(s) will overcome barriers and achieve project objectives, and leverage public and/or private finance.

| | | Financial Instrument | Amount | Currency | Tenor | Pricing |
|-------------------------------------|--|--|--|---|------------------------|-----------------------------|
| C.2.2 Project financing information | Total project financing (a) = (b) + (c) | | TBC | <u>million USD (\$)</u> | | |
| | (b) Requested GCF amount | (i) Senior Loans (ii) Subordinated Loans (iii) Equity (iv) Guarantees (v) Reimbursable grants * (vi) Grants * | TBC | <u>Options</u> <u>Options</u> <u>Options</u> <u>Options</u> <u>Options</u> <u>million USD (\$)</u> | () years () years | () % () % () % IRR |



| | | | | | | |
|--|--|---|---------------|---|----------------------------|--|
| | | * Please provide detailed economic and financial justification in the case of grants. | | | | |
| | | Total Requested (i+ii+iii+iv+v+vi) | TBC | <u>million USD (\$)</u> | | |
| | | Financial Instrument | Amount | Currency | Name of Institution | Seniority |
| | (c) Co-financing | <u>Grant</u> <u>Options</u> <u>Options</u> | TBC | <u>million USD (\$)</u> <u>Options</u> <u>Options</u> | SPREP | <u>pari passu</u> <u>Options</u> <u>Options</u> |
| | | Lead financing institution: | | | | |
| | (d) Covenants | | | | | |
| | (e) Conditions precedent to disbursement | | | | | |

C. 3 Expected Performance against Investment Criteria (if applicable)

Please explain the potential of the underlying Project /Programme to achieve the Fund’s six investment criteria as listed below.

C.3.1 Climate impact potential [Potential to achieve the GCF's objectives and results]

The final structure of the Full Funding proposal will be determined by the outcomes of this Readiness request, however maximizing the climate impact potential is a key priority in determining how best to use and implement Climate Information Services in the partner countries. Sectors where Climate Information Services are recurrently making a significant impact in developing countries and small island states include agriculture, coastal infrastructure, food and water security, public health, tourism and cross-cutting disaster risk reduction. Vulnerable communities experience climate variability, extreme and change impacts primarily through increases in the frequency and severity of extreme events. These climate shocks such as drought, flooding, coastal inundation, erosion and heat waves erode community livelihoods through loss of assets, impaired health, and destroyed infrastructure. The uncertainty imposed by climate variability is an impediment to the adoption of improved climate adaptation measures and to the community-wide transformations required to adapt to longer term climate change. Apart from effective intervention, projected increases in the frequency and severity of extreme climate events (e.g. precipitation extremes, drought, heat waves, coastal inundation) are expected to undermine development gains and intensify the cycle of rural poverty and vulnerability. The use of Climate Information Services is being used to help better manage climate-related risk and the development of an enabling environment for local communities to adopt climate-smart practices, all while protecting them from damaging climatic extremes. This is only one example of the possible benefits and uses of Climate Information Services in the final project.

C.3.2 Paradigm shift potential [Potential to catalyze impact beyond a one-off project or programme investment]

This programme will contribute significantly to the creation of a climate and disaster resilient enabling environment through the development and delivery of best available Climate Information Services targeted directly at adaptation end-user needs. The programme will serve to establish a knowledge basis to underpin on-ground adaptation across sectors and regions. Application will clearly demonstrate the need for and value of Climate Information Services in National and Sub-National decision making and can be easily replicated elsewhere in the region.

C.3.3 Sustainable development potential [Potential to provide wider development co-benefits]

Provide the estimates of economic, social and environmental co-benefits.

Estimates of economic, social and environmental co-benefits of investment in enhanced delivery and application of CIS is a key activity of this Readiness Proposal and will be determined upon the completion of the activities described in this Readiness request, including based on the development of a CIS specific cost-benefit assessment framework and baseline conditions.

According to ADB (2013) *The Economics of Climate Change in the Pacific*, 'business as usual' (IPCC) greenhouse gas emissions scenarios (mean condition), total climate change cost in the Pacific is estimated to reach 12.7% of annual GDP equivalent by 2100. IUCN Oceania (2010) indicates that the Pacific Ocean is the major economic, social and cultural lifeline providing resources and livelihoods for an estimated 10 million Pacific islanders. As an example, IUCN Oceania (2011) estimates that the economic contribution of tourism and fisheries alone is in the order of US\$3.3b to the national economies in the Pacific, or more than 10% of regional GDP, and employing more than 200,000 people. Further, the same study estimates the total economic value of selected marine resources/ecosystem services to be in the order of US\$3.3b annually (direct and indirect values) for coral reefs and US\$3.8b annually for mangrove systems, and that the expected costs of climate change to national economies overall will be in the order of US\$7b over the next 20 years (IUCN Oceania 2010).

It is further estimated by ADB (2013) that Pacific region adaptation costs across all vulnerable sectors would be in the order of \$158 to 775m per annum until 2050 to prepare for best-worst case scenarios (with \$447m under business-as-usual). These estimates are however for changes in mean climate condition, and do not explicitly account for costs of adapting to additional catastrophic extreme climate events. It is further recommended that policy interventions need to include (amongst other things) "...mainstreaming climate change actions in development planning...to minimize the impacts of climate change...", "...adopting a risk-based approach to adaptation and disaster-risk management can help prioritise climate actions and increase the cost-efficiency of adaptation measures...", and "...improving knowledge and the capacity to deal with climate uncertainties is a key issue for Pacific developing member countries" (ADB 2013).

A recent study by Kumar and Taylor (2015) *Exposure of Coastal Built Assets in the South Pacific to Climate Risks*, estimates that 57% of all assessed built infrastructure in 12 Pacific countries, including Vanuatu, is within 500m of the coastline, amounting to a present total replacement value of US\$21.9b. For Vanuatu specifically, although 52% of built infrastructure was beyond 500m of the coastline, this represents only 10% by value, suggesting that the highest value built infrastructure in Vanuatu is along the coastline. Kumar and Taylor (2015) conclude that these results have implications for damage under present climate extreme events, as well as future climate change, posing considerable threats to economies in the highly concentrated coastal zone in the Pacific.

The World Bank Group, with a current hydro-meteorological investment portfolio of around US\$500m, estimates that globally improved weather, climate and water observation and forecasting could lead to up to US\$30b/annum in increases in global productivity and up to US\$2b/annum in reduced asset losses (WMO, 2015). More specifically, Hallegate (2012) estimates economic benefit/cost ratio of improving meteorological/hydrological services at national level in weather and climate sensitive sectors ranging between 4:1-36:1 within developing countries. According to WMO (2015), full benefit:cost estimates for investment in science and technology-based enhanced climate services need to incorporate triple bottom line (economic, social and environmental) analysis. As an example, Holland (2014) *Economic Dimensions of Improved Meteorological Services in the Pacific* estimates that a 1% reduction in damage from (improved information and) improved severe weather warnings to the community and business would generate regional cash savings of US\$3.6m; an estimated 6:1 benefit/cost ratio.

C.3.4 Needs of recipient [*Vulnerability to climate change and financing needs of the recipients*]

PacificSIDS are highly vulnerable to multiple climate hazards as a result of natural climate variability and extremes. To address existing climate impacts, and to prepare for predicted increases in such risks from climate change, these countries will need to put in place institutional frameworks and policies to facilitate sustainable climate resilient development based on long-term planning. These frameworks, policies and plans in turn will need to be informed by comprehensive, consistent, timely and scientifically robust, evidence-based decision-making by multiple stakeholders over multiple spatial and temporal scales in order to achieve best practice climate adaptation and disaster risk reduction outcomes.

According to CSIRO and Bureau of Meteorology (2014) *Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports* and CSIRO, Bureau of Meteorology and SPREP (2015) *Climate in the Pacific: A Regional Summary of New Science and Management Tools*, key climate risks for Vanuatu include increasing air and sea surface temperature, increasing sea levels, changes in frequency and intensity of tropical cyclones, extreme rainfall, drought, temperature and sea level events, and increasing ocean acidification and coral bleaching. Therefore, ready access to credible, science-based CIS to inform all aspects of policy development, planning and associated decision-making for climate adaptation and disaster risk reduction purposes

is a crucial requirement to underpin sustainable resilient development at regional, national and sub-national scale over multiple time frames.

Vanuatu is among countries in the Pacific region that are most vulnerable to the risks of climate change, climate variability and sea level rise. The livelihood of its people and economy which are interwoven, shaped and driven by climate sensitive sectors, the effect of climate and sea level change are already very real and pose a tangible threat to the future socio-economic well-being of Vanuatu. As expected, the degree and nature of vulnerability varies, in between islands however climate change impacts the livelihood of all people as well as climate sensitive sectors such as agriculture and livestock, coastal zones and reefs, water resources, health, forests and biodiversity. Adaptation to climate change, variability and sea level change is an urgent need for Vanuatu. According to the World Bank (2015), TC Pam was the worst natural disaster to hit the Pacific region in recent memory, causing huge economic, social and environmental damage and loss, including 11 people confirmed dead, 65,000 people requiring emergency shelter, 17,000 buildings damaged or destroyed and a total economic costs of approximately US\$450m (64% of GDP). In the next 50 years, it is estimated by World Bank (2015) that Vanuatu has a 50% chance of experiencing a loss exceeding US\$330m, but with better preparation, the benefit:cost ratio for investment in early warning systems is in the order of 4-40:1. More recently, Vanuatu is now suffering from acute water shortages and crop failure as a cumulative effect of TC Pam and the current extreme El Nino effect prevailing over the south-western tropical Pacific.

C.3.5 Country ownership

[Beneficiary country ownership of project or programme and capacity to implement the proposed activities]

Country ownership for the Pac CLIM APPS proposal will be built through the proposed readiness project. The readiness project will ensure the necessary level of support and input into the design of the Pac CLIM APPS proposal.

Further the Pac CLIM APPS proposal (as it currently exists) will see all project activities delivered by SPREP/CSIRO in partnership with National Meteorological Services in order to meet specific sector based end-user CIS needs. As such the project design and governance structure is set-out in such a way to ensure the appropriate engagement of the relevant country stakeholders. This process will also ensure that the project design is consistent with and complementary to the prescribed priorities of relevant national plans and strategies.

The NDA for Vanuatu has issued a No-Objection letter for the draft Full Proposal, already.

C.3.6 Effectiveness and efficiency *[Economic and financial soundness and effectiveness of the proposed activities]*

This will be determined upon the completion of the activities as outlined in this Readiness request.

The assessment of environmental, social and economic co-benefits, including gender sensitive development impacts will be factored into the programme design, with emphasis on a dedicated project-based activities as outlined under Sub-Component 2.1. Moreover, the specific requirements for triple-bottom line SEB studies will be elucidated during the programme inception phase and implemented during the first year of the programme's work plan. This will ensure that a framework is in place and a benchmark established up front, from which subsequent assessments can be undertaken to inform relevant project-based activities under other Components of the programme. This approach is also consistent and integrated with the implementation of the proposed monitoring and evaluation plan to ensure that key findings can inform design and implementation of such programmes in other Pacific SIDS for staged replication of the programme throughout the region over the next decade. Relevant indicators (see also section E1.2) will include an appropriate combination of quantitative, semi-quantitative and qualitative, climate sensitive social, economic and environmental performance metrics.

C.4 Status of Underlying Project/Programme

- 1) A pre-feasibility study is expected to be completed at this stage. Please provide the report in section E.
- 2) Please indicate whether a feasibility study and/or environmental and social impact assessment has been conducted for the proposed project/programme: Yes No
(If 'Yes', please provide them in section E.)
- 3) Will the proposed project/programme be developed as an extension of a previous project (e.g. subsequent phase), or based on a previous project/programme (e.g. scale up or replication)? Yes No
(If yes, please provide an evaluation report of the previous project in section E, if available.)

Consistent with specified priorities of the Pacific Islands Meteorological Strategy (PIMS) 2012-22 (SPREP, 2012) and more broadly the imperatives of the draft (2015) Strategy for Climate and Disaster Resilient Development in the Pacific (SRDP), climate science-based gaps and needs analysis has been undertaken with Pacific national meteorological and hydrological services (NMHSs) and other key regional and national stakeholders as part of the recently completed *Pacific Climate Change Science Program* (PCCSP) and *Pacific-Australia Climate Change Science and Adaptation Planning* (PACCSAP) Program, 2009-2014 (www.pacificclimatechangescience.com), and the ongoing Climate and Oceans Support for the Pacific (COSPPac) program. These analyses highlight the need for improved scientific understanding of the climate system in the Pacific as well as improved transfer of this knowledge into decision-making at a national/sub-national sectoral level and within local communities. These detailed gaps and needs analyses have been completed and documented in direct consultation with users within Pacific NMSs as part of PACCSAP forums in Honiara, Solomon Islands (2013) and as part of the WMO Global Framework for Climate Services (GFCS) regional workshop and associated Pacific Meteorology Council's 'out-of-session' meeting in Cook Islands (2014). A key outcome of the 2014 Cook Islands forum was the establishment of the Pacific Roadmap for Climate Services and the Pacific Islands Climate Services (PICS) Panel. The imperatives of risk-management and climate adaptation lies at the heart of the GFCS, which is an international initiative being spearheaded by WMO and a wide range of UN partners in collaboration with governments and stakeholders to roll-out user-driven CIS. The GFCS supports effective climate risk management and adaptation to climate variability and change, with priority being given to agriculture and food security, water, health and disaster risk reduction. The PICS panel has more recently further elucidated identified and prioritised CIS gaps and needs at national level for each partner PIC, as documented in the Report on the 2nd Meeting of the Pacific Islands Climate Services (PICS) Panel (PICS Panel 2015).

In relation to the PCCSP/PACCSAP science program specifically, this was deliberately designed and implemented as a regional program, with the primary objective of increasing scientific understanding of climate variability, extremes and change in the western tropical Pacific. Key stakeholders, although not exclusively so, were the partner PIC NMSs and regional organisations (including SPREP, SPC and USP). This was in the context that prior to PCCSP/PACCSAP there was limited such knowledge and that most stakeholders were coming from a very low baseline. Whereas PCCSP/PACCSAP was substantially successful at generating a considerable and credible cohort of new science-based climate knowledge complete with a range of purpose built communication products and research/management tools for the Pacific, including nationally relevant climate projections data consistent with IPCC processes, there was limited scope for end-user engagement for development of sector specific science information for policy and planning. In particular, limited support was available for partner PIC NMSs to engage with sectoral stakeholders to communicate this knowledge and to translate it into applied, on-ground actionable knowledge by end-users. This GCF program will provide country, site and sector specific science and complement the regional work of PACCSAP.

There has been no specific technical evaluation undertaken for this programme. The technical design of this program is collectively informed by outcomes of the PCCSP/PACCSAP Program and extensive consultation between SPREP and executing partners with relevant stakeholders in Vanuatu over the last several via various regional and national forums including the Pacific Climate Change Roundtable and the activities of the Pacific Met Desk Partnership and projects such as Pacific Adaptation To Climate Change (PACC)(SPREP and UNDP 2014) and the Pacific Islands Framework for Action on Climate Change (PIFACC 2015). More specifically, as part of the evaluation of the PACCSAP science program, extensive in-country stakeholder engagement was undertaken at regional and national level in fourteen partner Pacific Island countries including Vanuatu, to identify remaining information gaps and emerging needs at national level. At the Honiara 2013 PACCSAP Science Symposium, a panel of NMHS directors and delegates provided direct insight into the national priorities around CIS for meeting stakeholder needs. At an out-of-session meeting of the PMC, as a side event to the Cook Islands regional GFCS workshop in 2014, these priorities were re-affirmed by NMHS directors. More recently, in an inter-regional strategic planning meeting in Melbourne, Australia in 2015, involving SPREP, the Indian ocean Commission, the WMO, CSIRO and the Bureau, a consensus decision was made to progress complementary regional CIS-based strategies in the Indian Ocean and the Pacific SIDS, with Pacific emphasis on providing increased support for turning new climate science knowledge into applied, on-ground adaptation outcomes at a sectoral level in partner PICS. The PACCSAP program has recently published jointly between CSIRO, Bureau and SPREP the 2015 report entitled 'Climate in the Pacific' in which the key climate impacts have been described for all countries including Vanuatu, based on the latest climate science knowledge for the region.

Other relevant programmes include the Pacific Adaptation to Climate Change (PACC) Program (and other SPREP delivered activities), various climate adaptation programme and project activities implemented by SPC, implementation activities of the PIMS under direction of the PMC and the PICS panel, Island Climate Updates and Online Climate Outlook Forums, PIC National Adaptation Programmes of Action implementation activities, ROK-PI



CLIPS/APEC CC, WMO GFCS, COSPPac, FINPAC and PACE-SD. Learnings from relevant Australian programmes in Australia will also be leveraged including the Australian Climate Change Science Programme (ACCSP), Australian Natural Resource Management (NRM) climate projections and services and the new Earth Systems and Climate Change Hub of the Australian National Environmental Science Programme (NESP).

Concurrently, the WMO has been rolling out the implementation of the GFCS in the Pacific (Pacific Roadmap for Climate Services) and other SIDS regions, including consultation with key stakeholders on gaps and needs, and identifying the development of CIS and associated capacity in met services and sectors as a priority action. Likewise the PMC through the PICS panel has identified priority actions relating to development of CIS and associated capacity to facilitate implementation of the Pacific Islands Met Strategy. There have also been several national-led strategies undertaken in Vanuatu identifying priority gaps and needs in relation to CIS in support of adaptation planning, including the Vanuatu Government's National Adaptation Programme of Action (NACCC 2007). A full bibliography of relevant literature from which this programme has drawn strategic intelligence to inform the direction, methodologies and operational approach is provided in the Annexes.

A synthesis of the learnings from the relevant CIS-based programmes in the Pacific is being undertaken as part of the Readiness project and outcomes will inform the final Full GCF Proposal.

D. Remarks

The total budget for the underlying project/programme will depend on outcomes of the Readiness proposal. Further there is scope for the underlying proposal to include more than 1 country.

E. SUPPORTING DOCUMENTS FOR READINESS PROPOSAL (IF APPLICABLE)

- Logical Framework – Annex 1
- Implementation and Disbursement Schedule – Annex 2
- Detailed Budget – Annex 3
- Risk Assessment – Annex 4
- CBA Scoping Study Methodology – Annex 5

Annex I. Logical Framework

| | Description | Indicators | Baseline |
|-----------------|---|--|---|
| Outcomes | | | |
| 1.0 | NDA and in-country stakeholders fully engaged, informed and supportive of the proposed GCF funded Pac-Clim-APPS in Vanuatu | Partner country NDA, other key in-country stakeholder and GCF sign-off on relevant outputs (1.1-1.3) of the Readiness Project. Upon Readiness Project Completions NDA's provide letter of support for full proposal | Existing partner country and regional documentation reporting next/end user CIS gaps, needs and in-country capacity; including existing draft Pac-Clim-APPS GCF Full Proposal and ancillary documented feedback from GCF secretariat and partner country NDAs |
| 2.0 | The rationale for delivery of Pac-CLIM-APPS within the context user needs, capacity gaps and of previous and ongoing donor-funded climate science/service-based projects/programs in the western tropical Pacific fully elucidated and understood by key stakeholders in the GCF and partner countries. | Partner country NDA, other key in-country stakeholder and GCF Secretariat sign-off on relevant output (2.1) of the Readiness Project | Existing documentation describing delivery and impact of relevant recently completed (PCCSP/PACCSAP) and ongoing (COSPPac, FINPac, Rok-ClIPS-PI, other) CIS related projects and programs in the western tropical Pacific; existing draft Pac-Clim-APPS GCF Full Proposal and ancillary documented feedback from GCF secretariat and partner country NDAs |
| 3.0 | Framework and associated baseline for undertaking triple-bottom-line (social, economic and environmental) Cost-Benefit Analysis and associated Monitoring and Evaluation of Pac-Clim-APPS outcomes and impacts | Partner country NDA, other key in-country stakeholder and GCF Secretariat sign-off on relevant outputs (3.1) of the Readiness Project | No CBA baseline exists; project activity to establish a CBA baseline and agreed framework for implementation as part of Pac-Clim-APPS GCF Full Proposal; existing draft Pac-Clim-APPS GCF Full Proposal and ancillary documented feedback from GCF secretariat and partner country NDAs |
| 4.0 | Enhanced readiness of key stakeholders for proposed implementation of Pac-Clim-APPS in partner PICTs | Enhanced/completed Full Proposal (Output 4.1) ready for submission/endorsement by the GCF Board, with partner country NDA, other key in-country stakeholder and GCF Secretariat sign-off | Existing draft Pac-Clim-APPS GCF Full Proposal and ancillary documented feedback from GCF secretariat and partner country NDAs |

| | Description | Indicators | Baseline |
|----------------|--|---|---|
| Outputs | | | |
| 1.1 | in-country workshop and stakeholder gaps and needs analysis and preliminary capacity mapping completed and reported for Vanuatu | Participation/support and Endorsement by partner country NDA, other key in-country stakeholder and GCF Secretariat; compliance with contractual obligations of the GCF Readiness Proposal | Existing partner country and regional documentation reporting next/end user CIS gaps, needs and in-country capacity; including existing draft Pac-Clim-APPS GCF Full Proposal and ancillary documented feedback from GCF secretariat and partner country NDAs |
| 2.1 | Synthesis Report describing scope/scale of recently completed and ongoing projects/programs delivering support for relevant aspects of 'climate information services' to PICTs, with emphasis on remaining gaps and needs and opportunities for strategic alignment with Pac-Clim-APPS | Ditto | Ditto |
| 3.1 | Synthesis Report with summary analysis and key findings/recommendations in relation to scoping study on 'Designing a Framework and Establishing Baseline Conditions for Socio-Economic Cost-Benefit Analysis for Delivery of Climate Information Services in the Western Tropical Pacific' | Ditto | Existing CBA frameworks developed for SPREP Pacific Adaptation to Climate Change (PACC) Project, WMO (2015), Global Trade and Analysis Project (GTAP) documentation and other relevant published literature on relevant CBA methods and frameworks; existing partner country and regional socio-economic data held within relevant national and regional databases. |
| 4.1 | Final Report for Pac-Clim-APPS GCF Readiness Project, including key learnings and recommendations for informing GCF Full Proposal | Ditto | As listed above for Outputs 1.1-3.1 |

| | Description | Indicators | Baseline |
|--|--|--|---|
| Activities | | | |
| Activity 1 Implementation - SPREP will lead on the organisation and logistics of the country workshops, working closely with in-country partners. The Workshops themselves will be co-chaired by SPREP and the Country Partner. Workshop materials (presentations, questionnaires, and interactive sessions) will be prepared jointly by CSIRO and SPREP. SPREP and CSIRO time and services for this activity will be provided in-kind. | | | |
| 1.1 | Undertake In-country stakeholder consultation meetings and workshops(x 2) in Vanuatu, involving: <ul style="list-style-type: none"> local partner country NDA/focal points next/end-users, SPREP and CSIRO, and complete final reporting of CIS gaps/needs and capacity | Endorsement by partner country NDA, other key in-country stakeholder and GCF Secretariat; compliance with contractual obligations of the GCF Readiness Proposal for Output 1.1 | Existing partner country and regional documentation reporting next/end user CIS gaps, needs and in-country capacity; including existing draft Pac-Clim-APPS GCF Full Proposal and ancillary documented feedback from GCF secretariat and partner country NDAs |

| | Description | Indicators | Baseline |
|---|---|--|----------|
| Activities | | | |
| Activity 2 Implementation - CSIRO will lead on the synthesis of lessons-learned, best practice and workshop recommendations, with input from SPREP as appropriate. CSIRO and SPREP will draw on relevant internal multi-disciplinary expertise and inputs from key stakeholders across relevant service providers where appropriate to assist in the development of the synthesis report to ensure outputs are tailored to sector-specific needs. Costs for this activity are to offset salary costs of CSIRO. | | | |
| 2.1 | Undertake environmental scan and collate, review/analyse and synthesise/document summary information, including: <ul style="list-style-type: none"> description of the scope/scale of recently completed and ongoing projects/programs delivering support for relevant aspects of 'climate information services' to PICTs to include input as appropriate from in-country stakeholder consultations (Activities | Endorsement by partner country NDA, other key in-country stakeholder and GCF Secretariat; compliance with contractual obligations of the GCF Readiness Proposal for Output 2.1 | Ditto |

1.1.1-1.3.1) and identify remaining gaps and needs and opportunities for strategic alignment with Pac-Clim-APPS as appropriate

| | Description | Indicators | Baseline |
|--|---|--|---|
| Activities | | | |
| Activity 3 Implementation - CSIRO will lead on the development of the cost benefit assessment framework and baseline conditions, with input from SPREP and other CROP agencies partners with expertise in CBA in the Pacific region as appropriate. Costs for this activity are to help offset salary costs of CSIRO. | | | |
| 3.1 | Undertake specified work packages for scoping study on cost-benefit analysis (summary brief attached), including: <ul style="list-style-type: none"> • WP#1 – Climate and weather related shocks • WP#2 - Baseline socio-economic implications of shocks • WP#3 – Counterfactual analysis of CIS application • WP#4 – Final analysis, synthesis and reporting | Endorsement by partner country NDA, other key in-country stakeholder and GCF Secretariat; compliance with contractual obligations of the GCF Readiness Proposal for Output 3.1 | Existing CBA frameworks developed for SPREP Pacific Adaptation to Climate Change (PACC) Project, WMO (2015), Global Trade and Analysis Project (GTAP) documentation and other relevant published literature on relevant CBA methods and frameworks; existing partner country and regional socio-economic data held within relevant national and regional databases. |

| | Description | Indicators | Baseline |
|--|--|--|--|
| Activities | | | |
| Activity 4 Implementation – SPREP and CSIRO will jointly lead with the delivery of reporting activities and re-design of the Pac-Clim-APPS Full GCF Proposal. Costs for this activity are to help offset salary costs of CSIRO. SPREP will provide additional support for this as an in-kind contribution to the project. | | | |
| 4.1 | Collate all final reports for key activities/sub-project components, synthesise, analyse and report, including: <ul style="list-style-type: none"> • final ground-truthing of key findings and recommendations with key stakeholders for input to Pac-Clim-APPS GCF Full Proposal • Complete Readiness Project Final; Report | Endorsement by partner country NDA, other key in-country stakeholder and GCF Secretariat; compliance with contractual obligations of the GCF Readiness Proposal for Output 4.1 | As listed above for Activities 1.1.1-3.1.1 |



- | | | | |
|--|---|--|--|
| | <ul style="list-style-type: none">• Update draft Pac-Clim-APPS GCF Full Proposal incorporating agreed key findings and recommendations from Readiness Project Final Report for submission to GCF Board Meeting in June 2016 | | |
|--|---|--|--|

Annex III – Detailed Budget Breakdown (by Activity)

| Activity 1.1 Vanuatu Consultation | Unit No | Unit Cost | No Days | Total (USD) |
|--|---------|-----------|--------------------|---------------|
| SPREP Travel: | 3 | 2500 | | 7500 |
| CSIRO Travel | 1 | 1500 | | 1500 |
| SPREP Per Diem: 3 pax 270 USD x7days = USD4,860 | 3 | 270 | 7 | 5670 |
| CSIRO Per Diem: 1 pax 270 USD x 7 days | 1 | 270 | 7 | 1890 |
| National Stakeholders Workshop (venue and catering): 1 day | | 1000 | 1 | 1000 |
| In country rep travel and Per Diem: 5 x 100 x 6days (to support adequate in-country sector specific representation) | 15 | 150 | 6 | 16,000 |
| Sector Specific Engagement Workshop: 3 days x USD1,000 (venue, catering, transport costs) | 1 | 2000 | 3 | 6000 |
| | | | SUB TOTAL | 39,560 |
| SPREP and CSIRO Salary (in-kind, including Activity 1.1.1 and Activity 1.1.3) | | | | 20,000 |
| | | | | |
| | | | TOTAL (USD) | 59,560 |
| | | | | |
| Note: Per Diem rates are based on the Sept2015 DSA Rates. | | | | |
| | | | | |
| Activity 2.1 Cost-Benefit Scoping Study (see attached) | | | | |
| | | | | |
| CSIRO Services (*): | | | | 45,000 |
| Workshop Travel costs (as per Attachment 5 CBA method) | | | | 6,500 |
| | | | | |
| | | | TOTAL (USD) | 51,500 |
| | | | | |
| Activity 3.1 Synthesis of CIS Projects/Programmes | | | | |
| CSIRO Services (*): | | | | 15,000 |
| | | | | |
| | | | TOTAL (USD) | 15,000 |
| | | | | |
| Activity 4.1 Project Administration & final reporting | | | | |
| CSIRO Services (*): | | | | 12,500 |
| Travel and misc costs(to allow for any ad-hoc travel that may be needed to support completion of the proposal, | | | | 6,500 |



| | | | | |
|--|-----------------------------|--------------------|--|-------------------|
| including travel to country for face-to-face follow-up) consultation | | | | |
| SPREP Project Administration Fee (includes SPREP Regional Implementing Agency services, as well as use of financial systems and activity monitoring and reporting services) | | | | 12,256 |
| | | | | |
| | | TOTAL (USD) | | 31,056 |
| | | | | |
| | TOTAL ESTIMATE (USD) | | | \$ 157,316 |
| | Total GCF component | | | \$137,316 |
| | Total in-kind | | | \$20,000 |
| <p>(*): As described in the Procurement Plan (and elsewhere in the proposal) this proposal represents a Joint Venture between SPREP and CSIRO, on behalf of the Vanuatu Government. CSIRO will undertake these Activities and will receive an allocation to cover costs (including personnel time and overheads).</p> <p>The Service Fee component of Activity 4.1, like the other Service Fees is in relation to costs associated with delivery of services to complete the activity. Only SPREP is to collect a Project Administration Fee</p> | | | | |

Annex IV– Detailed Risk Matrix

| G.2. Risk Factors and Mitigation Measures | | | |
|---|---------------------------|-----------------------------------|-------------------------------|
| <i>Please describe financial, technical and operational, social and environmental and other risks that might prevent the project/programme objectives from being achieved. Also describe the proposed risk mitigation measures.</i> | | | |
| Selected Risk Factor 1 | | | |
| Description | Risk category | Level of risk | Probability of risk occurring |
| Support for/participation in programme project activities by key stakeholders in Vanuatu | Technical and operational | Medium (5.1-20% of project value) | Medium |
| Mitigation Measure(s) | | | |
| <i>Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?</i> | | | |
| Key risk mitigation response measures: <ul style="list-style-type: none"> • Ensure the programme design is relevant to/aligned with existing national and sectoral priorities • Ensure proposed programme activities are relevant to/aligned with existing sectoral activities • Develop work plans in collaboration with in-country partners and ensure proposed programme activities are appropriately resourced and scheduled to minimize disruption to existing services • Ensure programme activity outputs are customized/tailored for target end-users and in-country capacity is developed to facilitate active engagement • Ensure programme design and implementation based on fit-for-purpose Monitoring & Evaluation framework | | | |
| Proposed mitigation response will lower the probability of risk occurring to Low | | | |
| Selected Risk Factor 2 | | | |
| Description | Risk category | Level of risk | Probability of risk occurring |
| Access to relevant technical expertise, national data sets and relevant baseline/existing CIS and related information | Technical and operational | Medium (5.1-20% of project value) | Medium |
| Mitigation Measure(s) | | | |
| <i>Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?</i> | | | |
| Key risk mitigation response measures: <ul style="list-style-type: none"> • Ensure that requisite expert, multi-disciplinary technical expertise is accessed through consortium of programme partners • Utilise existing open-source Intellectual Property (IP) and associated CIS, and/or negotiate requisite IP agreements as appropriate, from PACCSAP, COSPPac, FINPAC and other regional programmes • Negotiate and secure appropriate national data access agreements with key stakeholders during programme inception phase • Implement relevant programme activities during Programme inception phase/year 1 to undertake initial SEB analysis to establish baseline triple-bottom-line assessment metrics and data | | | |

| <ul style="list-style-type: none"> Ensure programme design and implementation based on fit-for-purpose Monitoring & Evaluation framework <p>Proposed mitigation response will lower the probability of risk occurring to Low</p> | | | |
|--|---------------------------|------------------------------|-------------------------------|
| Selected Risk Factor 3 | | | |
| Description | Risk category | Level of risk | Probability of risk occurring |
| Lack of focus and alignment with national/regional initiatives | Technical and operational | High (>20% of project value) | Low |
| Mitigation Measure(s) | | | |
| <p><i>Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?</i></p> <p>Key risk mitigation response measures:</p> <ul style="list-style-type: none"> Undertake key stakeholder engagement/consultation and environmental scanning during programme inception phase to identify relevant regional and national/sub-national strategies, programmes/initiatives and associated priorities upon which the case studies will be based/aligned and/or integrated with Environmental scanning to elucidate priorities, to include relevant JNAPS, NAPAS, PMC-PICS panel priorities and planning, GFCS implementation priorities and planning, other regional climate-related programming priorities, sectoral plans and priorities, etc. Ensure programme design and implementation based on Monitoring & Evaluation framework <p>Proposed mitigation response will maintain the probability of risk occurring as Low</p> | | | |
| Selected Risk Factor 4 | | | |
| Description | Risk category | Level of risk | Probability of risk occurring |
| Inability to transfer knowledge and replicate learnings in other Pacific SIDS | Technical and operational | High (>20% of project value) | Medium |
| Mitigation Measure(s) | | | |
| <p><i>Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?</i></p> <p>Key risk mitigation response measures:</p> <ul style="list-style-type: none"> Ensure the programme design has appropriate level of investment and resourcing in communications, knowledge brokering and outreach, as well as in-country capacity development, to facilitate extension and application of programme learnings to other countries Ensure programme develops and implements a communications plan incorporating targeted stakeholder engagement to facilitate regional support for the initial programme in Vanuatu Design the exit strategy for the close-out of the programme to incorporate a seamless transition to concurrently developing and implementing the next programme in other Pacific SIDS on an overlapping, staged basis over a ten year term | | | |

| <ul style="list-style-type: none"> Ensure programme design and implementation based on fit-for-purpose Monitoring &Evaluation framework <p>Proposed mitigation response will lower the probability of risk occurring to Low</p> | | | |
|--|---------------------------|------------------------------|-------------------------------|
| Selected Risk Factor 5 | | | |
| Description | Risk category | Level of risk | Probability of risk occurring |
| Insufficient resources to effectively and efficiently implement programme, communicate key findings and facilitate outreach | Financial | High (>20% of project value) | Medium |
| Mitigation Measure(s) | | | |
| <p><i>Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?</i></p> <p>Key risk mitigation response measures:</p> <ul style="list-style-type: none"> Ensure the programme design has appropriate level of investment and resourcing in communications, knowledge brokering and outreach, as well as in-country capacity development, to facilitate extension and application of programme learnings to other countries Ensure that all Components incorporate relevant aspects of communications, knowledge management and outreach at project/activity level in a complementary manner with programme level communications, knowledge management and outreach planning. Ensure programme design and implementation based on fit-for-purpose Monitoring &Evaluation framework <p>Proposed mitigation response will lower the probability of risk occurring to Low</p> | | | |
| Selected Risk Factor 6 | | | |
| Description | Risk category | Level of risk | Probability of risk occurring |
| Programme not appropriately designed to address objectives and to realise/sustain expected long-term outcomes and impacts | Technical and operational | High (>20% of project value) | Low |
| Mitigation Measure(s) | | | |
| <p><i>Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?</i></p> <p>Key risk mitigation response measures:</p> <ul style="list-style-type: none"> Ensure programme design and implementation based on fit-for-purpose, logical (theory-of-action)-based Monitoring &Evaluation framework Programme level M&E framework to be complementary with GCF Performance Management and Result Monitoring Framework and specifically contribute to hierarchy of GCF outcomes and impacts Ensure that programme design and resource allocation provides requisite support for building in-country capacity and CIS which are customized/tailored for target end-users such that practice change around use of CIS becomes endemic within sectors of interest | | | |



- Undertake real-time monitoring and evaluation at all stages and at all levels, including to project/activity level throughout the delivery of the programme, and provide ongoing feedback to project/activity design, resourcing and work plan scheduling as appropriate
- Ensure that M&E measures appropriate (SMART) Key Performance Indicator metrics to assess agreed key outputs, outcomes and impacts

Proposed mitigation response will maintain the probability of risk occurring as Low

Annex V– CBA methodology

Designing a Framework and Establishing Baseline Conditions for Socio-Economic Cost-Benefit Analysis for Delivery of Climate Information Services in the Western Tropical Pacific

A Scoping Study as Part of Pac-Clim-APPS GCF Readiness Project

1 Background

According to the United Nations Millennium Development Goals, providing adequate access to services, infrastructure and resources is a prerequisite to reduce the number of people living below the poverty line. Continued access to services is crucial for human well-being and facilitating social and economic development, attaining shared prosperity and achieving social justice and ecological sustainability. This is particularly relevant for Small Island Developing States (SIDS) in the western tropical Pacific which are particularly vulnerable to the multiple impacts of climate variability, extremes and change.

For many Pacific Islands Countries and Territories (PICTs), such impacts include increasing air and sea surface temperatures, changing rainfall patterns, increasing sea level, ocean acidification, and increasing frequency and/or intensity of extreme events such as tropical cyclones, floods, drought, storm surges and coral bleaching. Tangible, on-ground climate adaptation outcomes which build climate resilience and sustainability in local communities can be enhanced through increased access to and application of Climate Information Services (CIS); particularly so where CIS are tailored to meet sectoral and community needs to inform relevant policy development, planning and associated decision-making.

Having said that, there are presently no standardised frameworks and limited baseline data for undertaking socio-economic cost-benefit analysis (CBA) to measure impact of CIS delivery in the western tropical Pacific. To this end, it is not presently possible to undertake a meaningful (transparent, objective, robust and quantitative) evidence-based analysis of the costs, benefits, trade-offs and risks relevant to the social, economic and environmental objectives of Pac-Clim-APPS proposal for the Green Climate Fund.

2 Aim and Objectives

The main aim of this scoping study is to design a framework and establish a baseline for an evidenced-based analysis of the socio-economic benefits of delivering CIS to partner PICTs through the proposed GCF funded Pac-Clim-APPS program.

In this context, the key objectives of this scoping study which will help address this aim are to:

- (1) understand the socio-economic impact of climate related events such as droughts, floods, cyclones, and storm surges
- (2) provide a framework for undertaking a systematic analysis to highlight the long term socio-economic benefits of an investment in CIS through Pac-CLIM-APPS, and
- (3) establish a set of agreed (qualitative and semi/quantitative) metrics and associated baseline conditions for Pac-Clim-APPS in selected PICTs as ‘primers’ for further ground-truthing, analysis and for monitoring and evaluation (M&E) as part of Pac-Clim-APPS implementation.

3 Key research Questions and Approach

The scoping study will focus on the following key research questions and methodological approach:

1. Quantify the economic (productivity and welfare) impacts of historical climate related events on selected PICTs at both sectoral and community level;
2. Determine the net-socio-economic (changes in output, price and welfare) effects of CIS where they are directly linked to improved climate adaptation capacity and resilience within relevant sectors and at community level

To address the above questions and develop policy relevant insights, we will use a computable general equilibrium (CGE) or economy wide framework to undertake relevant CBA. Specifically, we will use:

- an economy wide, multi-region computable general equilibrium model to measure desired indicators of changes in climate adaptation capacity and resilience. CGE models have been successfully used by governments, international donors such as the World Bank, and other research organisations to perform such analyses elsewhere in the world for different applications, including CIS CBA, and
- an additional modelling based approach involving plausible scenario analysis. This approach will utilise the Global Trade and Analysis Project (GTAP) Model, which is used by 400+ government research organisations and a host of private consulting organisations across the world for many decades (see Appendix for further information).

4 Work Program

The proposed Work Program to implement this scoping study consists of four integrated work packages to be delivered by a small collaborative team consisting of suitably qualified economists from SPREP and CSIRO, with support from relevant on-ground stakeholders in partner PICTs. The total indicative cost is estimated to be in the order of US\$60-65k, including salaries and operating (primarily travel and opex costs for proposed mini workshop(s) at SPREP as part of Work Package 1 and/or 4). The total time for delivery is expected to be in the order of three months commencing asap in late Oct/early Nov (subject to commission date for the Readiness Project) and finished in late Jan/early Feb 2016 prior to completion of the Readiness Project).

Work Package 1.

Climate and Weather Related Shocks. Through a literature survey, develop a database of climate and weather related shocks. These shocks will be used within the GTAP model so the fully economy wide implications of these events can be calculated. Specific attention will be paid to the impact of climate and weather events on variables such as infrastructure, human health, labour, and other capital, sector specific impacts, such as reduction in output from agriculture, tourism, services, and so on.

Output: A working paper detailing climate and weather events and their associated impacts at sectoral and community level.

Duration: 8 weeks.

Work Package 2.

Baseline Socio-Economic Implications of Climate and Weather Related Shocks. From the database developed in Work Package 1, we will translate the climate and weather impacts into structured shocks that can be implemented within the GTAP model framework. From these shocks, we can calculate the economy wide socio-economic impacts of these climate and weather events. Metrics include, changes in terms of trade, price of staples, quantities of outputs, changes in demand, shifts in household expenditure, changes in government spending, changes in household savings and general welfare.

Output: A working paper detailing the net socio-economic impacts of climate and weather related events. The analysis here will focus on two-three country specific case studies taken from the delivery of work package 1.

Duration: 6 weeks.

Work Package 3.

Counterfactual analysis of CIS application. This work package attempts to quantify the climate damages avoided due to application of CIS. Using expert opinion and quantifiable assessments, (such as those proposed by Day (1970) and reprinted in Holland (2014) and shown below), of avoided damages due to improved forecasting

Capability and adaptation practices, we will re-run the experiments from work package 2, to quantify the benefits of avoided climate impacts. We will also conduct sensitivity analysis, to determine the robustness of the costs and benefits of CIS.

Output: Documented case studies of the costs and benefits of improved CIS. Apart from providing a demonstration of a proof of concept for the CBA of CIS, this document will service as a template for a wider and more detailed analysis in the larger Pac-Clim-APPS proposal for the Green Climate Fund.

Duration: 4 weeks.

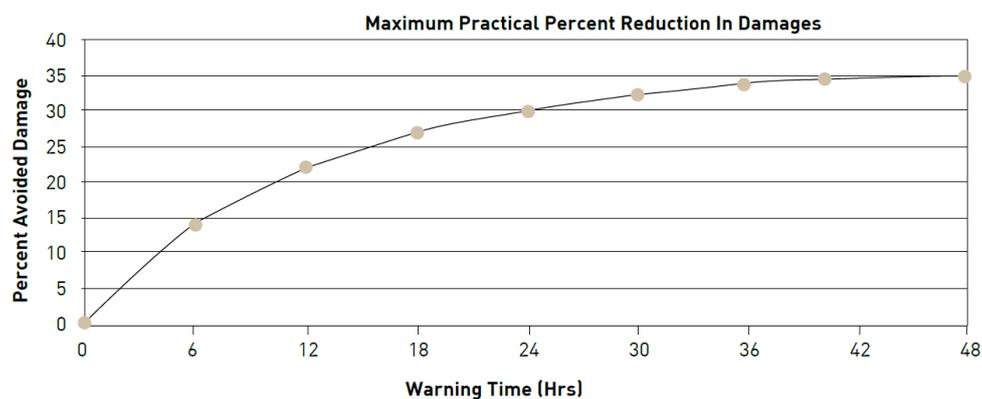


Figure 1. Example parameterisation of Avoided damage from improved CIS.

Work Package 4.

Final Analysis and Synthesis. This work involves final analysis, collation and synthesis/reporting and communication of the outputs from all completed work packages to key Pac-Clim-APPS stakeholders including partner countries, GCF and SPREP/CSIRO and proposed Executing partner agencies. This Work Package will thereby facilitate the input of key learnings into the Pac-Clim-APPS GCF Readiness Project Final Report and subsequently the Full Proposal ready for submission at the June 2016 GCF Board meeting.

Output: This work package has three key deliverables:

- (1) final synthesis/reporting and communication of the work conducted and key learnings; specifically including

- (2) a proposed CBA framework and established baseline conditions for selected partner countries for measuring on-ground impact of CIS applications for partner PICTs in the western tropical Pacific, and
- (3) a mini-workshop for Executing Partners to review key findings and finalise relevant components of the GCF Full Proposal (n.b. this could also be undertaken at the very start of the project as part of Work Package 1/project inception)

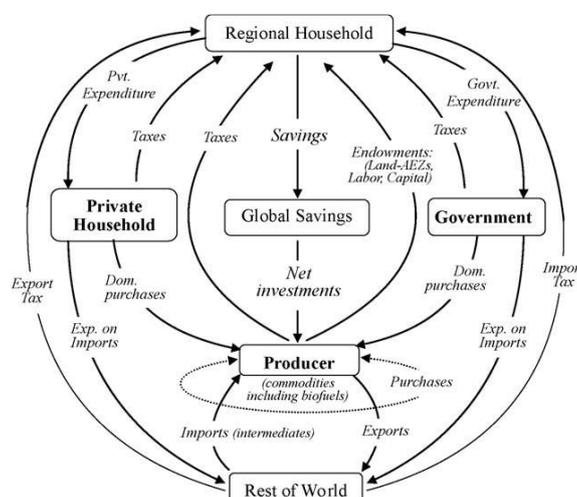
Duration: 4 weeks.

Appendix 1. The Global Trade and Analysis Project (GTAP) Model

The GTAP model is a multi-commodity, multi-regional computable general equilibrium model, with detailed economic theory and producer and consumer behaviour. The standard GTAP model employs the simple, but robust, assumptions of constant returns to scale and perfect competition in all the markets with Walrasian adjustment to ensure a general equilibrium. As represented in the figure below (Brockmeier, 2001), the regional household (e.g., the EU) collects all the income in its region and spends it over three expenditure types – private household (consumer), government, and savings, as governed by a Cobb-Douglas utility function. A representative firm maximizes profits subject to a nested Constant Elasticity of Substitution (CES) production function which combines primary factors and intermediates inputs to produce a final good. Firms pay wages/rental rates to the regional household in return for the employment of land, labor, capital, and natural resources. Firms sell their output to other firms (intermediate inputs), to private households, government, and investment. Since this is a global model, firms also export the tradable commodities and import the intermediate inputs from other regions. These goods are assumed to be differentiated by region, following the Armington assumption, and so the model can track bilateral trade flows. See Fig. A1. for a schematic of the GTAP approach.

Land is imperfectly mobile across uses. Labor and capital markets are segmented, allowing for differential returns between the agriculture and non-agriculture sectors and immobile across countries. Government spending is modeled by using a Cobb-Douglas sub-utility function, which maintains constant expenditure shares across all budget items. The private household consumption is modeled with a non-homothetic Constant Difference of Elasticity (CDE) implicit expenditure function, which allows for differences in price and income elasticities across commodities. Taxes (and subsidies) go as net tax revenues (subsidy expenditures) to the regional household from private household, government, and the firms. The rest of the world gets revenues by exporting to private households, firms and government. In the GTAP model, this rest of world composite is actually made up of many other regions – with the same utility and production functions as for the regional household at the top of this figure.

Fig A1. Schematic of the flows in the GTAP model. For each region in the model, this schematic is replicated with regions connected via the 'Rest of World'.



In Australia, a variant of the GTAP model, GTEM was used in developing low emissions targets and evaluating mitigation and adaptation policies. Around the world, the GTAP model and its variants have been used to evaluate the impact of climate change on agriculture, infrastructure, labour capacity, in regions all around the world.

Annex II: Readiness support in pipeline development in Senegal

READINESS | 2015



Readiness and Preparatory Support Proposal

Activity Area 4 | Pipeline Development

| A. Executive Summary (in one page) | |
|--|---|
| Country (or region) | Senegal |
| Submission Date | 26/10/2015 |
| NDA or Focal Point | Ministry of Environment and Sustainable Development |
| Contact Point (both NDA/FP and delivery partner) | <p>Focal point of Senegal Name: Ms. Madeleine Diouf Sarr Position: Head of Climate Change Division, Ministry of Environment and Sustainable Development Email: madodioufsarr@yahoo.fr Full Office address: Parc Forestier de Hann, B.P. 4055 Dakar, Senegal</p> <p>IFC Name: Mr. Stefan Rajaonarivo Position: Senior Operations Officer Email: srajaonarivo.ifc.org Tel: +221 33 859 7100 Full Office address: Rue Aimé Césaire x Impasse FN 18 prolongée, Fann Résidence, P.O. Box 3296 Dakar, Senegal</p> |
| Request Summary (in 200 words) | <p>Senegal is experiencing an acute energy crisis, which is hampering its economic growth and development. Its state owned utility, SENELEC, faces enormous challenges to find the financing to cope with ever-growing energy demands, maintenance of existing plants and an inefficient fuel supply. As a result, Senegal has been forced to run regular load shedding. Production is too expensive since it relies for the most part (about 90%) on petroleum imports. The scarcity of capital available to the government means that Senegal needs to turn to the private sector in financing future power projects. As such, the Government of Senegal would like to develop solar power generation with Independent Power Producers through the readiness support from GCF. To launch a solar IPP in Senegal, it requires a technical and economic analysis for the optimal size and location of multiple PV solar project sites across the country. Particularly, the government of Senegal would like to request support from GCF to finance a legal services including a comprehensive legal and regulatory analysis of the Senegalese energy sector to ensure laws and regulations allow for the development of private sector renewable energy projects. Senegal expects the International Finance Corporation will be the delivery partner for this readiness request.</p> |
| Anticipated Duration | 01/04/2016 – 31/3/2017 (12 months) |
| Estimated cost | Total Cost: US\$ 2,531,799 Funding amount requested to GCF: up to US\$ 600,000 |

B.1.1 Activity description (including objectives)

Many countries have struggled with slow and ineffective solar development whether via direct negotiation, feed in tariff or tender due to lack of institutional capacity (further details are discussed in section B.1.2). In order to avoid past missteps other countries have made, and in the interest of time, Senegal has approached IFC Advisory to do an assessment of what is required to develop solar energy projects throughout the country.

IFC Advisory will do comprehensive legal and technical analysis with the stated objective to rapidly mobilize competitive privately-funded grid-connected solar projects within the next two years. As such, IFC Advisory will undertake the following activities:

Activity 1: Legal and Regulatory Assessment

This activity includes the assessment of relevant policies, laws, regulations and institutions which allow and support the development of solar projects. Specifically, activities within this segment include:

- Legislation Review – review of specific legal instruments which enable the development of private sector renewable projects. This includes laws governing public private partnerships and concession agreements.
- Regulatory review – identification and review of the various regulating agencies that are involved in IPP licensing and operational oversight.
- Project-related institutional review – there maybe overlaps in the authority of, and/or contradictions between, institutions that influence project development. This may, for example, include inconsistencies in the mandates of national and regional authorities, and a lack of consensus between different national ministries, or governments in cross-sector projects. These overlaps and/or inconsistencies need to be identified and resolved before any project can proceed.

Activity 2: Project definition

Project definition refers to the early stage concept design work and is needed before the full feasibility phase, as it defines the project's parameters. Relevant activities within this phase include:

- Identification of desired outputs – Working with the Government of Senegal to determine the project specific outputs. Depending on the desired output, different legal and technical studies could be required.
- Pre-feasibility studies – once the desired output has been identified and selected, pre-feasibility studies could be required to be carried out or commissioned. These studies are high-level examinations of the rationale and will consider, amongst other things, the technical and financial challenges of implementation, expected project outcomes and impacts.

- Action planning – support the Senegalese Government in detailing and prioritizing the complex tasks identified in the pre-feasibility studies associated with private sector project development.

Activity 3: Project feasibility

After the pre-feasibility analysis, more detailed studies need to be undertaken as detailed below:

- Technical / engineering – assess the technical and engineering aspects of the project, in terms of optimizing project design and site locations.
- On site data collection – a solar resource assessment is essential for determining the optimal project sites, as well as determining energy yield predictions, which is required for any renewable IPP.
- Dispatch assessment – renewable generation imposes great challenges on the power grid, because renewable resources largely differ from conventional generation due to their uncertainty and variability. An assessment of the entire grid must be conducted to ensure the country can absorb and dispatch the energy generated from the proposed project sites.
- Environmental and social – assess and quantify the environmental and social impacts of the proposed project sites including gender aspects that can optimize gender benefits from the projects.
- Financial / financial modelling – support to design and build the often complex financial tariff modelling associated with renewable power projects.

Activity 4: Project Tendering

Creating the appropriate technical and commercial structure for a project will be critical for attracting finance and the right mix of finance. These activities build on the work in activity 3:

- Project Documents – the creation of standard projects documents, such as the Power Purchase Agreement (PPA), Implementation Agreements, Concession Agreements, & Government support agreement, etc. that can be used during the tendering process for all proposed project sites.
- Procurement – assist the Government in structuring and running an expedited open and competitive tender process in accordance with a standardized approach and utilizing standard documents to identify a shortlist of qualified and experienced developers and to select one as the winning bidder for the project.
- Transaction closing with winning bidder(s)

One important outcome of this readiness support will be capacity building of the government of Senegal including relevant ministries such as the Ministry of Energy and the Ministry of Environment, which is the focal point for the GCF. The project documents will be owned by the Senegalese government and the government officials will be participating in the project

implementation and extract lessons learned from the on-the-job training working through the IPP bidding process.

B.1.2 Background

Senegal has actively pursued reform policies in the energy sector, with a strong focus on promoting renewable energy. The current energy policy is reflected in the “Lettre de Développement du Secteur de l’Energie (LPDSE 2012),” a government strategy document whose main thrust is energy diversification based on renewable energies, bio-fuels and hydro-electricity at national and regional level. The Government of Senegal has determined that the Renewable Energy sector occupies an important place in the economic development strategy of Senegal. Their energy policy aims primarily at diversifying and reducing dependence on imported petroleum products by increasing the share of renewable energy and biofuels to 15% of the country’s energy production by 2020.

Institutional framework of power sector in Senegal:

Responsibility for the sector lies with the Ministry of Energy which is assisted by the Permanent Secretariat for Energy. The national electricity utility (Société Nationale d’électricité du Sénégal – SENELEC) is a state owned enterprise which has a monopoly for transmission and distribution. It also owns about half of the generation capacity, with the remainder being owned by Independent Power Producers (IPPs) which generate electricity and sell it exclusively to SENELEC. An independent Electricity Regulatory Commission (Commission de Régulation du Secteur de l’Electricité – CRSE), was established in 1998; its responsibilities are to approve revenue requirements for the sector and overall regulation.

Current regulatory framework and barriers in renewables:

The regulatory framework in Senegal comes in the form of decrees promulgated from time to time. The two most important and recent decrees for implementing the Law on Renewable Energy were issued in December 2011. They lay down the conditions of purchase and remuneration for electricity generated by renewable energy plants, the conditions for the connection of these plants to the grid, and the conditions for purchase and remuneration of surplus electricity from captive power plants generating electricity from renewables. However, reduced taxes and customs duties applicable to renewable energy equipment are only considered on a case-by-case basis. The decrees are therefore aimed at eliminating inefficiencies, decreasing the cost of supply to consumers, and promoting development funding for the energy sector.

The implementing decrees of the Renewable Energy Law are as follow:

Decree No. 2011-2013 provides conditions of power purchase and remuneration for electricity generated by renewable energy plants and the conditions of their connection to the grid. It also provides the formula for the avoided cost which serves as a reference for calculating the power purchase price cap. It also contains elaboration on renewable power purchase obligation and feed-in tariffs for different renewable energy technologies. Decree No. 2011-2014 provides the conditions of power purchase of surplus renewable energy-based electricity from self-producers. It has fixed the maximum intake from renewable energy sources (variable power), determined the purchase price, conditions of purchase of surplus energy and connection to the grid, and other conditions. Law No. 2010-22 of 15 December 2010 of the biofuel sector. A law on the orientation of the biofuels sector, was adopted in 2010 with the aim of creating favourable conditions for the

development of the biofuels sector and providing answers to the problems of economic growth, based on a policy of energy self-sufficiency through the development of biofuels. The law therefore covers all components of the biofuels sector including production, processing, storage, transport, marketing and distribution. It determines the operating environment for all forms of biofuels and the conditions and standards for their production and exploitation on Senegal's national territory and/or through international cooperation.

Experience with Independent Power Producers (IPPs) generating electricity for the national grid (from conventional sources) and the opening of the power-generating sector to renewable sources through the LPDSE 2008 should have increased the involvement of renewable-based IPPs. However, no mechanism exists yet to set appropriate feed-in tariffs (FiTs) and Power Purchase Agreements (PPAs) from renewable-based electricity generation for the grid.

Licensing, operation and sales of electricity are regulated by the Regulatory Commission of the Electricity Sector, which is also mandated to approve tariffs for electricity supply, regardless of the installation's size. This process is time-consuming and acts as a barrier to the implementation of small local projects, thus limiting their expansion. A measure to alleviate this constraint could include exempting installations below a certain capacity (e.g., below 100 kW) from requiring regulatory body approval for proposed tariffs, and instead allow approval at the local and community level. Through the proposed readiness support, the assessment on the regulatory and/or legal framework and policies related to will be undertaken, and options and recommendation to tackle any barriers for solar IPP will be explored and made.

IPP experiences in Senegal:

Senegal was among the first countries in Sub-Saharan Africa to introduce private sector participation in the power sector in the late 90s. The first IPP was GTI, a 52MW combined cycle oil-fired power plant commissioned in 2000. The second IPP was Kounoune, a 67.5MW power plant commissioned in 2008. The track record of IPPs in the country has been mixed, mainly as a consequence of variations in the quality of fuel delivered, grid instability and other technical difficulties which have reduced electricity output from these plants. Some of these issues have been resolved and the Government of Senegal (GoS) remains committed to relying on private sector investment to bridge the generation gap. About 90 percent of electricity in Senegal is generated using oil products. Imported crude oil is processed and refined by Senegal's only refinery, Société Africaine de Raffinage (SAR). Refined oil products are also imported directly, as SAR's processing capacity covers less than 40 percent of the market. Although majority owned by the private sector, SAR still operates like a public sector company. SAR is experiencing significant financial issues, largely due to SENELEC's (its largest client) financial situation, which often result in delayed payments to SAR for its fuel purchases. Over the past two years, the GoS had to step-in a few times and arrange for fuel imports directly from abroad to guarantee delivery of fuel due to SAR's shutdown. An IPP licence for small scale solar PV has been recently issued. However it has yet to reach financial close.

Supply/demand analysis:

Senegal experienced rapid electricity demand increase in the past decade due to economic growth. During 2012, peak electricity demand reached 466 MW, almost double the 234 MW of 2000. The

power demand profile rises seasonally during the hot months of June to October. Total installed generation capacity connected to the grid is 587 MW. Overall production in 2012 reached about 2,800 GWh, of which about 51 percent was provided by IPPs. The majority of this is based on diesel and Heavy Fuel Oil (HFO) power plants. SENELEC’s total installed generation capacity is 371MW, of which only 294MW are fully functional. Total installed generating capacity owned by IPPs is estimated at 212MW, including 92MW consisting of emergency containerized rental diesel units. Senegal imports approximately one tenth of its electricity from the Manantali and Felou hydro power plants in Mali through the interconnected regional network with Mauritania and Mali. Additionally, 47MW of non-grid connected installed capacity serves isolated centers in areas away from the main grid. Overall, electricity supply has not kept up with the demand growth. The main reasons for supply shortage are the sector financial challenges and the limited success in planning and implementation of new power projects. In spite of discussions on many IPPs since 2005, only three domestic project IPPs were developed (Kounoune, Sendou I, Tobene Power Project,). Most of the others have exhibited slow progress or have been abandoned.

The Government of Senegal identified the following key areas needed to stimulate the deployment of renewable energy in the country:

1. Detail out a comprehensive strategy for mapping renewable energy potentials in key areas including their techno-economic feasibility.
2. Facilitate grid integration of electricity generated from renewable sources by enacting the Renewable Energy Law, implementing decrees that provide the necessary conditions, guidelines and tariffs to incorporate renewable-based electricity to the grid.
3. Restructure the institutional, legal and regulatory framework for utilising land for biofuels production and adapt the rules of intervention of the regulator in off-grid small-scale renewable energy projects.
4. Identify the conditions needed to increase private sector involvement, especially for operation and maintenance, in the renewable energy sector.

B.1.3 Justification on request

Senegal is experiencing an acute energy crisis, which is hampering its economic growth and development (See figure 1. Key data on Economy of Senegal 2012-14) Its state owned utility, SENELEC, faces enormous challenges to find the financing to cope with ever-growing energy demands, maintenance of existing plants and an inefficient fuel supply. As a result, Senegal has been forced to run regular load shedding. Production is too expensive since it relies for the most part (about 90%) on petroleum imports. Senegal currently uses more than 35% of its foreign exchange earnings (\$1.2 billion USD) for oil imports, making it highly vulnerable to oil price fluctuations (Ministere des Energies Renouvelables, 2011). Senegal’s national access to electricity is estimated at 40%, with an objective to increase the national access rate to 50% by the end of 2017.

Figure1. Key Data on Economy of Senegal 2012-2014

| | 2012 | 2013 | 2014 |
|--|----------------|----------------|----------------|
| GDP (Current US\$) | 14,045,681,414 | 14,791,699,009 | 15,578,916,865 |
| Exports of goods and services (% of GDP) | 24 | 24 | 24 |
| Imports of goods and services (% of GDP) | 42 | 49 | 47 |

| | | | |
|---|----|-----|-----|
| Tax revenue (% of GDP) | 19 | ... | ... |
| Cash surplus/deficit (% of GDP) | 5 | ... | ... |
| Total debt service (% of exports of goods, services and primary income) | 7 | ... | ... |

source: World DataBank by the World Bank (2015)

Modernisation of Senegal’s power generation infrastructure lags behind demand. This is reflected in increased power generation costs – the current average wholesale cost of power in Senegal is higher than the Sub-Saharan region’s larger power systems (AfDB, 2011). The existing high cost of electricity means that it is very difficult to finance additional new connections by increasing existing consumer tariffs. The cost of electricity generation in Senegal is obviously sensitive to oil price. The electricity sector has therefore faced major shocks in the past decade due to the dramatic surge in oil prices. The crisis peaked in 2011 causing widespread load shedding and social unrest. The Government of Senegal designed an Emergency and Recovery plan for the period 2011-2015, named —Takkal Plan||. The goal of this plan is to restore stability in the electricity sub-sector with two clear objectives: (i) bring back a 10% minimum strategic safety margin on the supply-demand balance (generation capacity / demand); and (ii) reestablish SENELEC’s financial equilibrium through a mix a recapitalization, debt restructuring, tariff compensation, fuel purchase by Government and operational improvements (cost and loss reduction, commercial improvements, etc). Also the government of Senegal has taken a number of measures to improve end-use electricity efficiency, among which: (i) introducing the obligation to use efficient lamps nationwide and,

by law, forbidding the import and/or production of incandescent lamps in Senegal; (ii) the creation of a

National Agency for Energy Management and Energy Efficiency.

However, the major challenge remains: tariffs have not kept up with generation cost increases. The average end-user tariff in Senegal is XOF117 (EUR0.18) per kWh, which is higher than the average tariff in Sub-Saharan Africa (EUR0.14). due to an inappropriate energy mix given the country resources – 90% fuel-based with high volatility in prices – and an increasing use of peaking-plant technology (Gas Turbines - TAG) as base capacity (+120%), which resulted in a 500% increase in fuel purchase and 150% increase in average generation costs between 2004 and 2010. Despite the higher tariff comparing to neighbouring countries with similar power systems, it is still not sufficient to cover costs and investment needs. As a result, Government is obliged to provide direct and indirect subsidies (unpaid taxes) to its utility: these subsidies amounted to XOF120 billion (EUR183m) in 2012, XOF88 billion (EUR134m) in 2013, and XOF77 billion (EUR117m) in 2014.. The Government however found it politically difficult to pass the full cost increase on to consumers through tariffs. Weakened by the food and economic crisis, many consumers would have found it difficult to cope with the price shock. The Government was itself equally affected by the escalating fuel cost and the reduction in fiscal revenues because of the economic crisis. It was therefore not in a position to effect budgetary transfers of the magnitude required to compensate SENELEC for fuel and other costs it incurred.

Financial Deficit of SENELEC:

Structural operational loss-making position is limiting SENELEC's ability to finance new investments. Since 2005, SENELEC has only shown negative results, except in 2009, when a decrease in oil prices, and an operating subsidy of FCFA 40 billion, resulted in a net profit. This structural operating deficit was mostly felt in 2010 when SENELEC's financial situation deteriorated significantly. SENELEC's structural operating deficit is due to a tariff gap and a compensation mechanism based on a revenue cap formula resting on outdated capacity assumptions and inadequate principles that was not reflecting the reality of the energy sector and SENELEC's technology mix.

The scarcity of capital available to the government means that Senegal must turn to the private sector in financing future power projects. Although Senegal is making efforts to mobilize private sector finance for renewables through IPPs with varying levels of success in thermal power, such efforts continue to be hampered by perception of investor risks, regulatory concerns with competition between public and private actors, and difficulties in developing bankable business models. These challenges are also coupled with the following concerns:

- Lack of scale: navigating the unique features and structures for each project in a country deters investors and adds time and costs to projects. As a consequence, a country cannot benefit from economies of scale and efficiency.
- High transaction costs: individually negotiated contracts and financing weigh down projects with excessive transaction costs that increase tariffs. This is especially true for solar projects which are typically built on a smaller, more localized scale than thermal power.
- Limited institutional capacity: governments are stretched, with limited capacity to manage, structure and negotiate private power concessions, especially if the country has a limited track record with Independent Power Production (IPPs).

If these issues can be successfully resolved, utility-scale PV can be quickly and economically deployed to address supply-demand imbalances in national grids, and potentially lower power costs.

Senegal is endowed with large solar energy potential. Over most of country's territory, the solar irradiation is above 2,000 kWh/m²/year for Global Horizontal Irradiation and above 1,800 kWh/m²/year for Direct Normal Irradiation (Ministere des Energies Renouvelables, 2011). Declining panel and installation prices and excellent solar irradiation across much of the Senegal can combine to deliver power at competitive prices, even with the recent declines in oil. Tariffs under 10c have been seen in South Africa and Brazil and a recent auction in Dubai delivered startling tariffs under 6c/kWh. Tariffs of 10-15c/kWh could occur in Senegal if procured and installed professionally and at scale. Due to rapid construction times of under a year and price stability relative to volatile fossil fuels, PV solar can quickly help Senegal address its pressing energy needs. Given its intermittent nature, it holds the potential to be an important part of Senegal's energy solution, particularly if used properly and in coordination with hydro generation, which offers complementary storage.

B.1.4 Implementation arrangements

The IFC has been selected as a delivery partner for this readiness support. IFC has a proven track record of developing bankable IPPs as well as providing technical and legal advisory services similar to the proposed activities. IFC will therefore lead the implementation process of the project in collaboration with the Focal Point. The Focal Point and the country level Coordination Mechanism will lead the knowledge management and communication of the outcomes. A tripartite agreement will be signed among the government of Senegal, IFC and GCF.

- **Implementation schedule and disbursement plan**

IFC will deliver:

- 1) Milestone 1: Outputs of due diligence activities throughout activity 1-3 within 4 months of implementation as follows;
 - a. Activity 1
 - Document on legislation review
 - Document on regulatory review
 - Document on project-related institutional review
 - b. Activity 2
 - Early concept design with desired outputs
 - Report on pre-feasibility study
 - Action plan for the next phase
 - c. Activity 3
 - Report on Project feasibility study: Technical and engineering assessment on project design and site, on site data collection, dispatch assessment, environmental impact assessment, financial modelling
- 2) Milestone 2: Final tender documentation within 4 months of implementation;
- 3) Milestone 3: Issue of Request for Proposal documentation to pre-qualified bidders within 6 months of implementation.
- 4) Milestone 4: Evaluation assistance in reviewing and scoring the received proposals within 10 months of implementation.
- 5) Milestone 5: Transaction closing - Finalisation and execution of the project documents within 12 months of implementation

- Tentative implementation schedule

| | 2016 | | | | | | | | | | | |
|----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar |
| M1 | x | x | x | x | | | | | | | | |
| M2 | | | x | x | | | | | | | | |
| M3 | | | | | x | X | | | | | | |
| M4 | | | | | | | x | x | x | x | | |
| M5 | | | | | | | | | | | x | x |

The Fund will make direct payment to IFC, the delivery partner, through a trust account with IFC:

- 1) The upfront payment will be made up to US\$ 60,000 (10% of the amount requested) upon the effectiveness of the grant agreement.
- 2) The second payment will be made up to US\$ 270,000 upon the submission of a progress report and delivery of the Milestone 2.
- 3) The final disbursement of up to US\$ 270,000 will be paid upon a delivery of Milestone 5 and submission of completion report including financial statement certified by internal auditor of IFC with relevant documents such as invoices.

Green Climate Fund will cover the legal services cost, see Annex I for detailed terms of reference of legal services.

B.2 Readiness Risk Analysis

There are a number of risk and mitigation measures that should give the Fund comfort, namely:

1. IFC Advisory, as the delivery partner has a substantial track record in both tendering and financing solar power plants and as such knows first-hand what is required to create a “bankable” private sector project.
2. IFC has committed its own funds to the Readiness request. The total cost is approximately \$2,531,799 million USD, of which the Fund is requested to fund \$600,000 USD. IFC will pay for the majority of the study, which gives a large incentive to make sure the proposed project is implemented properly as planned.
3. The contract is a fixed price, meaning if the costs go above \$2,531,799 million USD, IFC will bear the added cost, and not request any additional funding from the Fund.
4. There is a significant demand for IFC advisory to demonstrate scalable solar is possible in Senegal.

B.3 Readiness Budget

Green Climate Fund will cover the legal consultant cost, which expects to amount US\$ 600,000. Any additional cost will be covered by IFC.

| | Total (in US\$) | Green Climate Fund Share (in US\$) |
|---|------------------|------------------------------------|
| IFC Staff Costs | 677,150 | 0 |
| IFC Travel Costs | 85,008 | 0 |
| IFC Overhead | 549,641 | 0 |
| Legal Sservices | 600,000 | 600,000 |
| Technical and E&S studies and Services Cost | 620,000 | 0 |
| Total | 2,531,799 | 600,000 |

C.1 Description of Underlying Project / Programme

The Fund requires the following preliminary information in order to promptly assess the eligibility of project/programme investment. These requirements may vary depending on the nature of the underlying project/programme.

C.1.1 Project / programme description (including objectives)

The Government of Senegal will mobilize competitive privately-funded grid-connected solar projects within the next two years based on the technical and legal analysis financed by GCF and IFC through the readiness programme.

C.1.2 Background information on project/programme sponsor

The World Bank Group (WBG) has demonstrated a long standing support to the energy sector in Senegal.

The WBG through the International Development Agency (IDA) has the following projects in Senegal:

- Electricity Sector Support Project – This is an \$85 million IDA credit supporting investments in Transmission & Distribution and Technical Assistance (TA) to sector reforms. The project contributes to (i) reducing SENELEC’s technical and commercial losses; and (ii) improving the reliability of electricity services in selected areas focusing primarily on Greater Dakar.
- Sustainable and Participatory Energy Management - PROGEDE II – This is a \$15 million IDA grant/credit aiming to increase the availability of diversified household fuel and to increase the income of affected communities while preserving the forest ecosystems.
- Tobene power plant – 96 MW. The World Bank Group signed agreements in 2014 for the Tobene Independent Power Project in Taiba Ndiaye in Senegal. These included a 93.4 million euro (including a 28.5 million euro loan for IFC’s account) financing agreement arranged by IFC and a \$40 million equivalent IDA partial risk guarantee project agreement. The project will provide power to over one and half million residents in Senegal.
- Energy is also an important sector in a series of Development Policy Operations (the governance and growth support credits).
- The Bank is providing \$1.8 million of Bank-executed TA through the SE4All (ESMAP) trust fund.

IFC Public Private Partnership advisory services is currently working on various projects in Senegal

- Desalination plant – IFC and the World Bank proposed to collaborate in order to support and advise the Government of Senegal (GoS) in attracting private investors to develop a desalination facility under a PPP scheme for an estimated capacity of 50,000 cubic meters per day. The contract between IFC and the GoS is on negotiation phase. IFC will

advise the GoS on options for private sector participation under a PPP scheme, and act as Lead Transaction Adviser.

- Bus Rapid Transit (BRT) systems – IFC should provide transaction advisory support to the GoS, represented by CETUD (Dakar Urban Transport Executive Council), in structuring a viable PSP model for the BRT system in the Greater Dakar Area. In fact, CETUD is seeking IFC's PPP Advisory technical assistance to structure a Public Private Partnership (PPP) arrangement for this transaction in order to attract and structure private sector participation (PSP) for the operations of the envisaged BRT Project.

C.1.3 Market overview

a. The historical and forecasted financial performance

SENELEC's Financial Performance -- Aided by lower international oil prices, the GoS subsidies to SENELEC have been reduced from about XOF120 billion in 2012 to about XOF88 billion in 2013 and XOF77 billion in 2014. SENELEC is also advancing the implementation of its loss-reduction program with network rehabilitation and upgrade investments.

Senegal power sector financial problem background -- Senegal's electricity sector has been facing financial challenges created by several factors, including a significant dependency on oil-based products as the generation mix in Senegal is 10% hydro and 90% thermal.

- The electric system is based on inefficient oil-based power plants operating beyond their initial design life span, and it suffers recurring power outages.
- Although the situation has improved, insufficient oil supply has been a recurring issue. Crude oil and refined oil is imported by the Société Africaine de Raffinage (SAR), the country's only refinery. SAR is however experiencing significant financial issues, and the GoS had to step-in a few times over the past years in order to arrange for fuel imports directly from abroad to guarantee delivery of fuel due to SAR's shutdown.
- The cost of electricity generation in Senegal is obviously sensitive to oil price. The electricity sector has therefore faced major shocks in the past decade due to the dramatic surge in oil prices. The crisis peaked in 2011 causing widespread load shedding and social unrest.
- Tariffs have not kept up with generation cost increases. The average end-user tariff is XOF 117 (EUR0.18) per kWh. It is higher than the average tariff in SSA (EUR 0.14), but it is not sufficient to cover SENELEC's costs and investment needs. As far as the overall SENELEC system (i.e. grid and off-grid) is concerned, the average total production cost per kWh – as calculated by the regulator was XOF 150 (EUR 0.229) in 2014. As a result, Government is obliged to provide direct and indirect subsidies (unpaid taxes) to its utility: these subsidies amounted to XOF120 billion (EUR 183m) in 2012, XOF88 billion (EUR 134m) in 2013, and XOF77 billion (EUR 117m) in 2014.

b. Key competitors with market shares and customer base

Transmission & Distribution

SENELEC is a state owned enterprise which has a monopoly for transmission and distribution. The electricity distribution system of SENELEC comprises (1) an MV network at 6.6 kV and 30 kV with a

total length of 7,627 km, (2) a LV network with a total length of 6,761 km; and (3) 13 HV/HV substations

Generation

Senegal's major source of electricity is mostly diesel and gas, with an installed capacity of 638 MW (2010).

- The General Electric/GTI Dakar IPP, was commissioned in 1998. It has an installed capacity of 56 MW.
- On-line since January 2008, the second IPP Kounoune 1 – 67.5 MW - was partially funded by IFC, with Mitsubishi and Matelec S.A.L, a division of the Doumet group from Lebanon, as strategic partners.
- Some hydroelectricity generated from the Manantali Dam in Mali is split between Senegal, Mali and Mauritania. Manantali has an installed capacity of 200 MW dispatched as follows: 52% for Mali, 15% for Mauritania and 33% for Senegal (66 MW)

SENELEC operates an interconnected grid, to which the future solar plants will be connected, and a series of off-grid centers. In terms of available grid-connected capacity, the latest available and reliable data are dated 2013 (see table below).

| Available grid-connected capacity 2013 | |
|--|------|
| Peak demand (MW) | 471 |
| Maximum available capacity (MW) | 5186 |

Thermal IPPs

The GoS has made progress on various thermal projects that will diversify the energy generation mix and reduce generation costs going forward.

- AfDB, and FMO financed Sendou I, a 125MW coal power plant, with an estimated average cost of about XOF 68/kWh – the project is now stopped due to a dispute between the sponsors;
- SENELEC has signed two additional coal projects;
- Electricity imports from Mauritania, from the IDA-MIGA supported Banda gas-to-power project at an estimated cost of XOF 70-75/kWh, and
- The Tobene project – supported by IFC and IDA - with an estimated cost of about XOF 111/kWh (assuming \$115/barrel).

c. Pricing structures, price controls, subsidies available and government involvement

Public payments

The GoS provides subsidies to SENELEC based on the difference between revenue requirements reviewed by the regulator and actual tariffs. These subsidies amounted to XOF120 billion (EUR183m) in 2012, XOF88 billion (EUR134m) in 2013, and XOF77 billion (EUR117m) in 2014.

C.1.4 Regulation, taxation and insurance

Regulation

An independent Electricity Regulatory Commission (“CRSE”) was established in 1998; its responsibilities are to approve revenue requirements for the sector and overall regulation, organize tenders for IPP (thermal and renewable) projects as well as regulate licensing, and tariffs.

C.1.5 Implementation arrangements

To be defined in bidder’s proposals.

C.2 Financing / Cost Information of Underlying Project / Programme

C.2.1 Description of financial elements of the project / programme

One objective of this Readiness request is to conduct technical analysis of the Senegalese grid, as well as SENELEC’s dispatch capabilities. This analysis will determine the optimal project size, given the various technical constraints. Due to economies of scale, the size of the project has a direct impact on the cost per MW and therefore at this time it is not possible to determine the financial elements of the project or the project size (number of MW’s), nor the cost per MW until the technical analysis is completed.

C. 3 Expected Performance against Investment Criteria (if applicable)

Please explain the potential of the underlying Project / Programme to achieve the Fund’s six investment criteria as listed below.

C.3.1 Climate impact potential *[Potential to achieve the GCF’s objectives and results]*

Power is a fundamental enabler for economic growth. Price, reliability and quality of electricity service affect most economic activities directly, or indirectly. In the specific case of Senegal, energy shortages, and high energy costs are hindering economic development. SENELEC and the GoS have indeed not been able to attract financing to maintain the existing infrastructure, let alone rehabilitate, and expand the country power infrastructure.

SENELEC is facing financial challenges created by several factors, including a significant dependency on oil-based products as the generation mix in Senegal is 10% hydro and 90% thermal. The proposed project will support SENELEC and the GoS efforts in strengthening the power sector by reducing the country’s reliance on oil-based electricity, and in reducing electricity generation costs over the medium to long term.

Meeting the twin goals of ending poverty and building shared prosperity in a sustainable manner is not possible without reliable modern energy services. With this project, the WBG is

aiming to assist the GoS in pursuing sector development through the development of solar IPPs which is sustainable in all respects (environmental, financial, fiscal, and social).

The direct beneficiaries are SENELEC and the GoS. Indirect beneficiaries include all electricity consumers on the interconnected network. Both SENELEC and GoS are clear about the fact the proposed project intends to solve a financial issue by reducing the country dependency on oil-based products.

If the project is successful, SENELEC will be able to substitute thermal and/or rental capacity with solar capacity during the day. As long as the solar energy price is lower than the variable production cost of the replaced⁷ oil-based plants, it should result in an improved cash flow situation for SENELEC. Subsequently, the GoS will be able to reduce the subsidies that contribute significantly to the country's deficit: from 2012 to 2014, these subsidies respectively represented between 1.1% and 1.7% of the country's GDP.

C.3.2 Paradigm shift potential *[Potential to catalyze impact beyond a one-off project or programme investment]*

Developing the first type of any power project always presents certain challenges unique to the project under development. This is particularly true for the Private Sector, as the allocation of risk between the Government, the off-taker and the project has yet to be determined. The first project is successfully developed achieves two objectives, it demonstrates that the project is technically feasible, and it establishes a risk-allocation benchmark for all of the various parties involved in the project. The projects that follows, significantly benefits from a reduction in transaction costs, which should lead to more projects and a lower tariff.

C.3.3 Sustainable development potential *[Potential to provide wider development co-benefits]*

The final Economic, Social, Environmental and Gender sensitive developmental benefits will be determined once the final project is developed. However it is envisaged that the some of the benefits include increased access to electricity for the 60% of Senegal that currently not connected to the grid, and significant foreign exchange savings due to the reduction in imported fuel.

C.3.4 Needs of recipient *[Vulnerability to climate change and financing needs of the recipients]*

The state utility, SENELEC has limited financial resources to engineer, procure and construct large scale power projects. Senegal desperately needs additional electricity generation and is turning to the Private Sector as the quickest option to best address it's pressing needs. The areas covered under this Readiness request are a prerequisite before the Private Sector will invest in renewable energy.

C.3.5 Country ownership

[Beneficiary country ownership of project or programme and capacity to implement the proposed activities]

The Government of Senegal has been working with the International Renewable Energy Agency (IRENA) to develop the equivalent of a country programme entitled the Renewables Readiness Assessment (RRA). The RRA, which was recently published, has identified PV solar as a potential renewable energy opportunity for the country. During the development of the RRA a wide range of stakeholders were identified to participate in workshops and discussions. The stakeholders were primarily technical staff drawn from government departments and public sector agencies, but also came from the private sector, civil society, development and cooperation agencies as well as financial institutions. In addition, bilateral meetings and interviews were conducted with key senior officials of these different institutions as well as officials from CERER (Centre for Studies and Research into Renewable Energy) at the University of Dakar, ASER (Agence Senegalaise d'Electrification Rurale), ASN (Association Sénégalaise de Normalisation) and CRSE (Commission de Regulation du Secteur de l' Electricite du Senegal). The following Government

departments and agencies have provided input in the development of Senegalese renewable energy strategy:

- Council of Ministers
- Inter-Ministerial Committee on Renewable Energy
- Ministry of Energy (MoE)
- Ministry of Renewable Energy (MER)
- Senegalese Agency for Rural Electrification (ASER)
- The national electricity utility SENELEC
- Intersectorial Committee for the Implementation of Synergies between Energy and other Strategic Sectors (CIMES)
- National Agency for Solar Energy (ANDES)
- University Cheikh Anta Diop de Dakar
- Study Centre for Renewable Energy (CERER)
- The Polytechnic School (ESP)
- CMS and Sen Finance

C.3.6 Effectiveness and efficiency [Economic and financial soundness and effectiveness of the proposed activities]

Please see section C.3.3

C.4 Status of Underlying Project / Programme

- 4) A pre-feasibility study is expected to be completed at this stage. Please provide the report in section E.
- 5) Please indicate whether a feasibility study and/or environmental and social impact assessment has been conducted for the proposed project/programme: Yes No
(If 'Yes', please provide them in section E.)
- 6) Will the proposed project/programme be developed as an extension of a previous project (e.g. subsequent phase), or based on a previous project/programme (e.g. scale up or replication)?
- Yes No
- (If yes, please provide an evaluation report of the previous project in section E, if available.)*

D. Remarks

E. SUPPORTING DOCUMENTS FOR READINESS PROPOSAL (IF APPLICABLE)

- Draft concept note / funding proposal
- Map indicating the location of the underlying project / programme
- Financial Model
- Pre-feasibility Study
- Feasibility Study
- Environmental and Social Impact Assessment
- Evaluation Report

ANNEX I: DRAFT TERMS OF REFERENCE FOR LEGAL SERVICES

Phase 1 – Due Diligence and Transaction Structuring

Legal Due Diligence

The Consultant will review the Standard Documents and conduct a legal due diligence exercise to identify all legal, regulatory and policy issues relevant to the successful implementation of the Project in Senegal on the basis of the Standard Documents. The Consultant will prepare a concise and clear draft due diligence report (“DD Report”) setting out its key findings and recommendations.

The Consultant will discuss the draft DD Report with IFC Advisory and the Government of Senegal (GoS) and thereafter issue a final DD Report, taking into account the comments of IFC and the GoS. Due diligence activities not capable of being carried out on a desktop basis are likely to be carried out in Dakar (Senegal).

Structuring Analysis

The Consultant will assist IFC in the analysis of available structuring options and propose a final transaction structure and framing its recommendations to the GoS, including analysis and recommendations on the allocation of legal, regulatory, commercial and other risks for the Project. The Consultant will support IFC in follow-up consultations with the GoS and other stakeholders to assist them to reach a decision on whether and how to proceed further with the Project (Phase 2).

Project marketing

The Consultant will assist IFC with the legal aspects of the marketing effort to potential investors (lenders and sponsors) by replying to written questions and participating in conference calls or meetings as agreed with relevant parties regarding legal aspects of the Project. The Consultant will also provide IFC with appropriate inputs related to institutional, legal and regulatory aspects to the Information Memorandum that will be prepared by IFC for promoting the Project to potential investors. The Consultant will support IFC in the preparation and the launch of the Request for Expression of Interest (REOI).

Phase 2: Project implementation (to Commercial Close)

Support to the preparation of required pieces of legislation

Drawing on the conclusions of the legal and regulatory framework due diligence, the Consultant will draft any necessary piece of legislation (or amendment to existing legislation) and legal instrument which may be necessary to facilitate the implementation of the Project.

Project Documents

The Consultant will amend the Standard Documents as necessary to: (i) reflect the recommendations in the Due Diligence Report as agreed with IFC and the GoS, and (ii) ensure that all documents conform with local laws and (iii) any legal agreements are legal, valid, binding and enforceable if executed or issued in the agreed form; (iv) complete sections/schedules of the PPA and GSA in final form.

The Consultant's responsibilities will include preparing initial drafts, finalizing those drafts in consultation with IFC and the GoS for inclusion in the bid pack issued to bidders.

Bid Process

The Consultant will support IFC in designing and implementing the bid process, including:

1. Assisting IFC and the Client in drafting prequalification criteria and procedures;
2. Finalizing evaluation criteria and the bidding process;
3. Finalizing bidding documents including, Request for Qualification (RFQ), Request for Proposal (RFP), the Project Documents in compliance with procurement laws and regulations and international best practices.
4. Assisting IFC in the preparation, population and management of a data room to facilitate bidder due diligence, including drafting procedures governing use of the data room, as well as appropriate confidentiality undertakings;
5. Supporting IFC in preparing responses to bidders on all questions and requests for clarification, taking primary responsibility for legal questions; attending pre-bid meetings and bidder road-shows as required; advising IFC generally in connection with this;
6. Assisting IFC in bid evaluation (including analysis of any amendments to the Project Documents proposed by bidders and of the technical and financial proposals of qualified bidders, drafting the legal sections of evaluation and selection reports);
7. Advising on bid related correspondence with bidders or legal issues associated with the bidding process;
8. Updating the risk matrix and accompanying note prepared during the Phase 1 before finalizing the Project Documents;
9. Generally advising IFC and the GoS on an ongoing basis to ensure compliance with applicable procurement and other laws and regulations throughout the bid process, and advising on any issues which may arise.

Transaction closing

The Consultant will play a key role in post-bid finalization of the Project Documents with the winning bidder(s). To that effect, he will assist IFC and the Client with:

1. Negotiating with the winning bidder(s) and in the finalization and execution of the Project Documents between the GoS and the winning bidder(s) until the date on which the Project Documents are signed with the winning bidder; and
2. Advise on closing and address any legal or contractual issues that may arise between bid award and signature of the Project Documents.
