

Environmental Assessment and Review Framework

Project No. 46495-002
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PNG: Building Resilience to Climate Change in Papua New Guinea

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LIST OF ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
AP	affected person(s)
CCA	Climate Change Adaptation
CCDS	Climate Compatible Development Strategy
CEMP	Construction Environmental Management Plan
CIF	Climate Investment Fund
CIFDA	Coastal Inland Fisheries Development Authority
CLTS	Community Led Total Sanitation
DEC	Department of Environment and Conservation
DDR	Due Diligence Report
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
EAC	Environmental Assessment Committee
EARF	Environmental Assessment Review Framework
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMMP	Environmental Management and Monitoring Program
EPAR	Environmental (Prescribed Activities) Regulations 2002
GRM	Grievance Redress Mechanism
FAD	Fish Aggregation Device
IEE	Initial Environment Examination
LLG	Local Level Government
LMMA	Locally Managed Marine Area
MDB	Multilateral Development Bank
NARI	National Agricultural Research Institute
NGO	Non-government organization
OCCD	Office of Climate Change and Development
PNG	Papua New Guinea
PMU	Program Management Unit
PPCL	PNG Ports Corporate Ltd
PPCR	Pilot Program for Climate Resilience
PPTA	Project Preparatory Technical Assistance
PSC	Project Steering Committee
REA	Rapid Environmental Assessment
SCF	Strategic Climate Fund
SPCR	Strategic Program for Climate Resilience
SPS	Safeguard Policy Statement 2009 (of ADB)
TOR	Terms of Reference
VHF	Very high frequency

Currency Equivalents

(as of 1 Mar 2015)

K 1.00 = x USD

\$1.00 = x K

Note: In this report, \$ refers to USD

EXECUTIVE SUMMARY

1. **Background.** The Papua New Guinea (PNG) Building Resilience to Climate Change (the project) is designed to implement the country's Strategic Program for Climate Resilience (SPCR), funded under the Pilot Program for Climate Resilience (PPCR) of the Strategic Climate Fund (SCF), a multi-donor Trust Fund within the Climate Investment Funds (CIF). The project will mainstream climate resilience into development planning and address country priorities focusing on the most vulnerable communities and sectors.
2. PNG was selected as one of the countries to participate in the PPCR. The Pacific PPCR has four components: country activities in three countries (Papua New Guinea, Samoa, and Tonga) and a region-wide component. The PPCR will provide financing through the multilateral development banks (MDBs) to support programs in the selected pilot countries. Proposals for PPCR funding are prepared jointly by the recipient country and the relevant MDBs.
3. The goal of the PPCR is to help countries transform to a climate resilient development path, consistent with national poverty reduction and sustainable development goals. In its nature as a pilot program and supporting learning-by-doing, PPCR implementation ultimately aims to result in an increased application of knowledge on integration of climate resilience into development.
4. **The project.** The project will facilitate integration of climate resilience into development processes through (i) enhanced access to financial resources dedicated to climate change adaptation; (ii) development and dissemination of knowledge products and adaptation tools; (iii) better understanding of climate change vulnerabilities and adaptation options; (iv) increased adaptive capacity at the sectoral, national, district, and community levels, thereby building climate resilient communities, (v) addressing climate change risks to food security; and (vi) development of climate-resilient infrastructure, all prerequisites for effective social development, food security, and poverty reduction.
5. By piloting and demonstrating a strategic risk-based approach to building climate resilience, it is intended that the project will help to increase PNG's resilience to climate variability and climate change through improved capacities to adapt to climate change impacts, and strengthened climate-responsive planning and development at the national, provincial, and local (district, local, and ward) levels.
6. **Impact and outcome.** The overall impact of the project is expected to be increased resilience to the impacts of climate change and climate variability. The outcome is expected to be improved capacities of communities, government agencies and civil society to plan and respond to the impacts of climate change. To achieve this outcome, the following four outputs will be implemented, (i) community climate responsive investment approaches identified and implemented, (ii) sustainable fishery eco-systems and food security investments demonstrated and piloted in nine vulnerable island and atoll communities, (iii) enabling framework for climate resilient infrastructure established, and the early-warning communication (or radio) network expanded/extended, and (iv) efficient project implementation and management.
7. **Sector approach.** This project is being treated similar to a sector investment. This approach is suitable because specific designs for output components, at specific sites, are not yet known.
8. The specific interventions will only be identified after a more detailed process of

community consultation, and vulnerability mapping and assessment, has been carried during the initial implementation phase of the project. From a safeguards perspective the sample subproject demonstrates application of the environmental assessment and review framework (EARF).

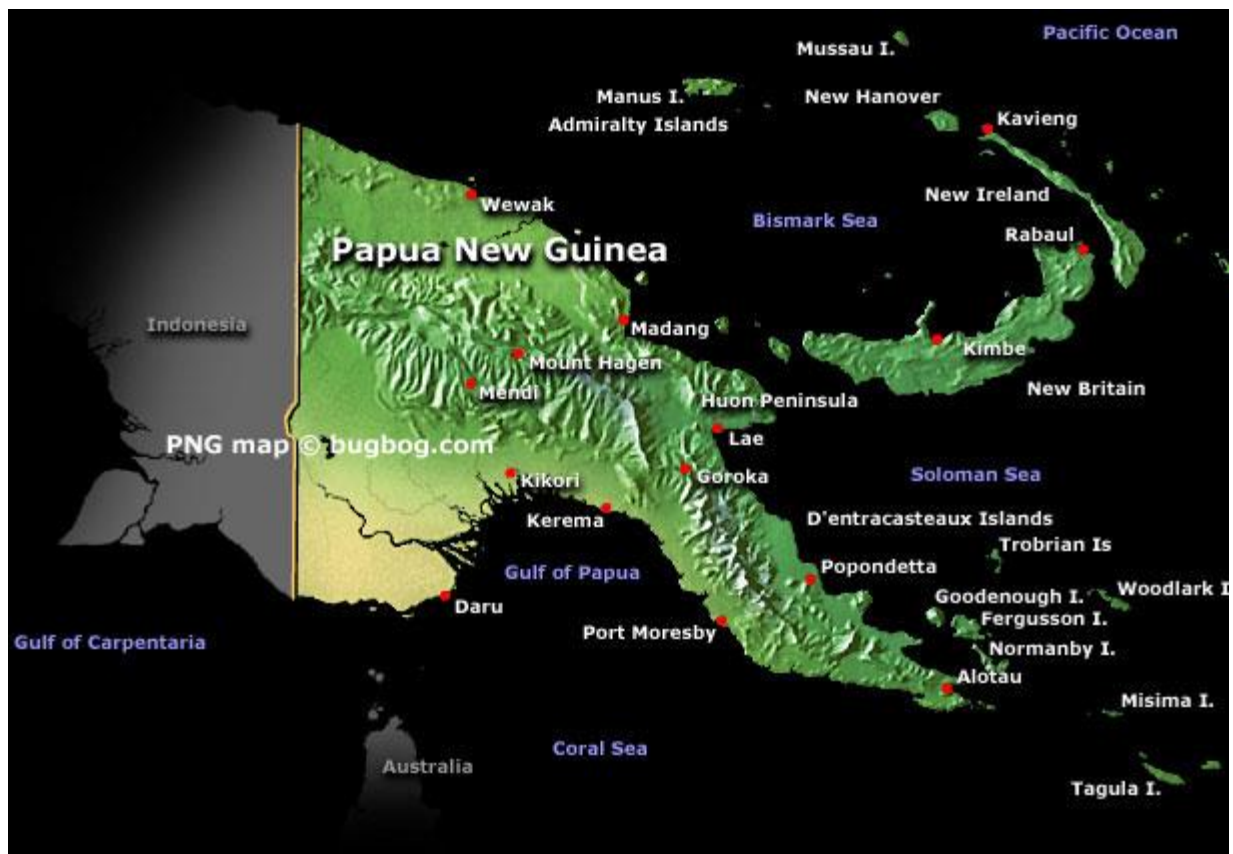
9. **Environmental assessment and review.** For output components with physical works or activities that have the potential to modify the environment, the procedures for environmental assessment and review set out in the ERAF will be followed. The ERAF complies with the requirements of PNG's Environment Act 2000 and Environment (Prescribed Activities) Regulations 2002 and ADB's Safeguard Policy Statement.
10. Based on selection against a set of criteria, activities will follow a process of screening, scoping, assessment, clearance (including approval and permit issue for Level 2 and 3 activities), implementation of environmental management plan provisions, and monitoring.
11. This ERAF also establishes the requirements and mechanisms for consultation and grievance redress. Disclosure of documents will comply with the ADB Public Communications Policy 2011 and requirements of the Environment Act.

1. INTRODUCTION

A. Background

1. Papua New Guinea (PNG) occupies the eastern half of the island of New Guinea and its offshore islands in Melanesia, a region of the southwestern Pacific Ocean located north of Australia and west of Solomon Islands (Figure 1.1). The national capital, Port Moresby, is located along the southeastern coast. PNG is one of the most culturally diverse countries in the world with 848 languages listed for the country. Most of the approximately seven million people live in customary and rural communities, which are as diverse as the languages. Only 18 per cent of the population lives in urban centers.

Figure 1.1 – Map of Papua New Guinea



2. **The project.** The Asian Development Bank (ADB) is supporting the government of PNG to develop the project 'Building Resilience to Climate Change' designed to implement the country's Strategic Program for Climate Resilience (SPCR). The SPCR is funded under the Pilot Program for Climate Resilience (PPCR) of the Strategic Climate Fund (SCF); a multi-donor Trust Fund within the Climate Investment Funds (CIF). The project will mainstream climate resilience into development planning and address country priorities focusing on the most vulnerable communities and sectors.

3. The natural environment throughout PNG is extremely fragile and highly vulnerable to both natural and human impacts. During the last 50 years or so, increasing pressures on the resources are intensifying the country's vulnerability due to extreme events and natural hazards such as cyclones, droughts, earthquakes and tsunamis. In addition to these threats and pressures to the environment, expected changes that may arise from climate change and climate variability will likely further exacerbate these impacts, and deplete the resources that are most essential for basic life support systems. PNG's rural coastal populations, especially those living on small, remote, and low-lying coral islands and atolls, are particularly vulnerable to sea-level rise and other weather-related manifestations of climate change.

4. Based on recommendations of an independent expert group, PNG was selected as one of the countries to participate in the PPCR. The Pacific PPCR has four components: country activities in three countries (PNG, Samoa, and Tonga) and a region-wide component. The PPCR will provide financing through the multilateral development banks (MDBs) to support programs in the selected pilot countries. Proposals for PPCR funding are prepared jointly by the recipient country and the relevant MDBs.

5. The goal of the PPCR is to help countries transform to a climate resilient development path, consistent with national poverty reduction and sustainable development goals. In its nature as a pilot program and supporting learning-by-doing, PPCR implementation ultimately aims to result in an increased application of knowledge on integration of climate resilience into development. The PPCR will complement, yet go beyond, currently available adaptation financing in providing finance for programmatic approaches to upstream climate resilience in development planning, core development policies, and strategies.

B. Project Overview

6. PNG was provided technical assistance to undertake the design and development of the project, which builds upon the comprehensive, inclusive and country-driven process used to develop the Climate Compatible Development Strategy (CCDS) which summarizes current and future threats from climate change and related hazards, and outlines measures and specific actions to address such threats. The project aims to make PNG's development investments climate resilient and support the country's transition to 'climate compatible development', as outlined in its national medium-term and long-term development strategies.

7. The project will facilitate integration of climate resilience into development processes through (i) enhanced access to financial resources dedicated to climate change adaptation; (ii) development and dissemination of knowledge products and adaptation tools; (iii) better understanding of climate change vulnerabilities and adaptation options; (iv) increased adaptive capacity at the sectoral, national, district, and community levels, thereby building climate resilient communities, (v) addressing climate change risks to food security; and (vi) development of climate-resilient infrastructure. All of these items are prerequisites for effective social development, food security, and poverty reduction.

8. By piloting and demonstrating a strategic risk-based approach to building climate resilience, it is intended that the project will help to increase PNG's resilience to climate variability and climate change through improved capacities to adapt to climate change impacts, and strengthened climate-responsive planning and development at the national, provincial, and local (district, local, and ward) levels.

9. **Impact and outcome.** The overall impact of the project is expected to be increased resilience to the impacts of climate change and climate variability. The outcome is expected to be improved capacities of communities, government agencies and civil society to plan and respond to the impacts of climate change. To achieve this outcome, the following four outputs will be implemented: (i) community climate responsive investment approaches identified and implemented, (ii) sustainable fishery eco-systems and food security investments demonstrated and piloted in eleven vulnerable island and atoll communities, (iii) enabling framework for climate resilient infrastructure established, and the early-warning communication (or radio) network expanded/extended, and (iv) efficient project implementation and management. A summary of the project outputs is provided below.

10. **Output 1: Community climate responsive investment approaches identified and implemented.** Focusing on eleven islands selected from the 21 identified vulnerable islands,¹ the project will: (i) prepare localized climate projections to identify potential climate threats; (ii) based on these projections, undertake climate vulnerability assessments in consultation with provincial administrations and beneficiary communities; (iii) prioritize climate adaptation subprojects in consultation with communities; and (iv) incorporate the climate adaptation subprojects in local level government, and district and provincial development plans. Based on these plans, the Project will support communities in preparing financing applications for identified climate adaptation subprojects to either District Services Improvement Program² or, where appropriate, a small grants facility (SGF)³ to be established under the project.

11. The SGF will be established within Office of Climate Change and Development (OCCD) with an allocation of \$5 million which will be used to finance approved climate adaptation subprojects.

12. The project will finance the installation or rehabilitation of around 190 water collection and storage facilities and around 100 ventilated improved pit (VIP) latrines that were identified in the vulnerability assessments as requiring priority implementation to meet basic community needs.⁴ Also, in response to identified vulnerabilities, the project will assist the 21 island communities to develop emergency response strategies in the event of an extreme event and provide training in actions and procedures to be followed.

¹ ADB. Building Resilience to Climate Change – Report and Recommendation to the President: Linked Document 4 - Project Administration Manual (Section I.A)

² The government allocated K10 million to each of the 89 districts in PNG to be spent on infrastructure and rehabilitation maintenance projects covering education, health law and justice, water supplies, agriculture, electrification, transport and community infrastructure.

³ This SGF will serve as a pilot for the Climate Change and Green Growth Trust Fund which the government intends to establish in due course.

⁴ Water collection, storage and distribution facilities will be located around community facilities - schools, aid posts and churches where there are large collection areas with public access. Focus will be given to improving village hygiene with the introduction of VIP latrines to reduce the impact from water-borne disease. About 100 latrines will be introduced on vulnerable islands together with associated training for local communities on latrine operational and maintenance requirements.

13. **Output 2: Sustainable fisheries ecosystems and food security investments demonstrated and piloted in eleven vulnerable island and atoll communities.** To sustain fisheries ecosystems in eleven of the identified vulnerable islands⁵ in three provinces, the project will: (i) support the establishment of locally managed marine areas (LMMA) to enhance and sustain productivity of fisheries through (a) the development of LMMA management plans; and (b) mapping and monitoring of the marine environment including fish species, corals and seaweed; (ii) demonstrate the techniques used in the rehabilitation of protective coral reefs surrounding vulnerable islands and degraded mangrove forests in nearby coastal areas; (iii) pilot income generating activities in the marine environment including mari-culture, fish and crustaceans; (iv) pilot localized processing of marine products to extend their shelf life; and (v) demonstrate the ridge to reef approach by stabilizing water catchment areas in island hinterlands by planting commercial tree species.

14. To improve food security in the same nine vulnerable islands, the project will: (i) assess the extent of food insecurity anticipated from climate change and variability impacts; (ii) based on this assessment, identify options to address food insecurities; (iii) hold consultations with local communities to prioritize the implementation of the options identified; and (iv) demonstrate how to implement selected priority options.⁶ The project will also support food processing and storage initiatives in villages to extend the shelf-life of perishable goods and increase the production of planting material on local agricultural stations. Through these activities, the trading links between vulnerable islands and the mainland will be strengthened and food insecurity reduced in both locations.

15. **Output 3: Enabling framework for climate resilient infrastructure established and early-warning communication (or radio) network expanded/extended.** The project will support the development of an enabling framework to mitigate the impacts of climate change on coastal infrastructure (ports, wharfs and jetties) through (i) developing relevant policy documents; (ii) upgrading engineering design standards; (iii) incorporating benefits from climate protection in feasibility studies; and (iv) introducing sustainable financing modalities for operations and maintenance. Consultants recruited to develop the enabling framework will also provide training to enhance the capacity of PNG Ports Corporation Limited (PPCL), provincial administration and Coastal Inland Fisheries Development Authority (CIFDA) personnel to more effectively incorporate climate change considerations into design, construction, operations and maintenance of coastal infrastructure.

16. The project will also extend the radio communications network to facilitate early warning for natural disasters and extreme climate events through a very high frequency (VHF) network linked to PNG's National Disaster Center and provide emergency and general communication services to the target islands and those within the signal coverage of the network. Equipment for five relay stations will be installed on existing towers, one in each province together with receiving equipment and disaster warning sirens on the 21 target islands.

17. **Output 4: Efficient Project Management.** The fourth output will strengthen project management to ensure efficient and timely implementation of the above three outputs and attend to the prescribed procurement, financial management and reporting on implementation progress.

⁵ The eleven islands within the target provinces, nominated by the government, to pilot and demonstrate replicable approaches.

⁶ Demonstrations will include production techniques, drought tolerant planting material, water management and rehabilitation of sago areas.

18. The objective of the SPCR is to achieve transformational change by supporting implementation of national strategies outlined in PNG's Vision 2050, Development Strategy Plan (DSP) 2010-2030, Medium Term Development Plan (MTDP) 2011-2015, Public Investment Plan (PIP) and the CCDS. While there is strong country commitment to mainstreaming climate resilience, as articulated through the national strategies and plans mentioned above (viz., DSP, MTDP, PIP and CCDS), mainstreaming efforts to-date have been constrained due to severe resource bottlenecks. With the preparation of the CCDS and related strategies and the establishment of the OCCD, substantial progress has been made at the policy and strategy level, and a commitment has been given to fast-track pilot programs in the future. This has enabled key priorities to be identified and a National Interim Action Plan for Climate Compatible Development to be developed. PNG also has a well-developed institutional framework for mainstreaming climate change adaptation (CCA). While this institutional framework is an important aspect of the effort to achieve operationalization of PNG's CCA plans and strategies, limited knowledge, tools, and capacity exist to undertake climate change risk management.

19. The need to integrate climate change considerations into maritime infrastructure design, building codes, and physical/coastal planning processes was identified as an urgent priority. Broad-based capacity building was also identified as a critical need.

20. Despite country commitment and the existence of a sound national strategy - the CCDS - the real task of implementing CCA at the operational level is in its infancy and climate change risk management is still to be integrated into policy, planning, and budgetary processes. Moreover, there is limited budget to meet even current priority development needs, let alone the cost of adaptation. The challenges are exacerbated on account of limited understanding of climate change risks at the district and community levels and a lack of technical capacity to integrate climate change risk management into planning processes. Further, there is no evidence of significant training at national, sectoral, or provincial/local levels to address this capacity constraint, although consultations held as part of developing the project revealed a strong desire for the PPCR to support such efforts.

21. The project will support the CCDS and will become part of the national budgetary process that supports implementation of Vision 2050 through the DSP and PIP. By providing much-needed support for capacity building at the national, provincial, district, local level government (LLG), sectoral, and community levels, and for the tools for informed decision-making on climate change risk management, project investments will create a pool of expertise and knowledge to ensure the timely, effective, and sustainable implementation of the CCDS.

22. **Partnership with ADB.** The ADB has developed a strong partnership with the national government of PNG and through the Pacific Approach 2010–2014 and Country Operations Business Plan 2013–2015 emphasizes the need for integration of climate change adaptation and disaster risk management to deal with climate-induced natural disasters. In addition to interventions planned under the project, current ADB programming support to PNG includes a new capacity-building project--Supporting Climate Sensitive Sector Development--as well as a regional project for Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change which will include PNG.⁷

23. In addition, climate change resiliency and disaster risk reduction are being incorporated as an integral part of infrastructure development and all other ADB-supported initiatives in PNG.

24. The project is intended to assist those communities in PNG that are facing the most

⁷ This regional project covers activities in the following Pacific countries: Cook Islands, Fiji Islands, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands, Samoa, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

pressing threats from the anticipated impacts of climate change. Annex 1 provides a brief overview of the climate change vulnerabilities on the small, remote, low-lying coral islands and atolls that will constitute the target sites for project interventions. Annex 2 provides a listing of the proposed sites, which includes basic statistical data, along with a series of location maps.

2. ENVIRONMENTAL LEGAL AND POLICY FRAMEWORK

A. PNG Environmental Assessment and Review Procedures

25. **Background.** The Department of Environment and Conservation (DEC) was established in 1985 vested with the powers to protect the environmental values of air, water, soil and biodiversity and the sustainable use of natural resources. Its mandate is taken from the Fourth Goal of the National Constitution which requires; "...Papua New Guinea's natural resources and environment to be conserved and used for the collective benefit of all and replenished for the benefit of future generations." DEC's mission is to ensure natural resources are managed to sustain environmental quality, human wellbeing and support improved standards of living.⁸

26. The Environment Act 2000 provides the basis for environmental impact assessment (EIA) procedures. It is a three-tiered system whereby all development activities are classified as Level 1, 2 or 3, depending on the extent of the impact of the activity on the environment and human health. Level 1 activities are those activities that will have minimal impact on the environment and are not permitted or licensed but apply environmental guidelines or codes of practices developed for specific activities on a voluntary basis. These activities are left to the provincial and local level governments to regulate if they so wish. Level 2 and 3 activities are permitted activities that may pose significant or major impact on the environment, with level 3 activities required to undergo full environment assessment.

27. The Environment (Prescribed Activities) Regulation 2002 (EPAR) classifies activities for levels 2 and 3, and the two levels of activities are subject to DEC permitting or licensing functions. Some activities require an environmental permit but do not require environmental assessment.

28. **EIA procedures.** The EIA process involves the proponent notifying the Director-DEC in writing of its intention to carry out preparatory works. The Director then advises the proponent to submit an inception report listing issues to be covered in an environment impact statement (EIS).

29. When the inception report is approved, the proponent is advised to carry out, prepare and submit the EIS, which sets out (i) the physical and social environmental impacts which are likely to result from carrying out an activity and (ii) measures to mitigate the anticipated impacts. An assessment and public review of the EIS is then conducted and a report is presented to the Director-DEC for acceptance. The accepted EIS and the assessment reports and other materials are referred by the Director to the Environment Council for the Council's review and its recommendations are sent to the Environment Minister for approval in principle or otherwise. The approval in principle enables the proponent to mobilize its resources to undertake the development, but it is not a permit to discharge wastes.

30. A separate application for a permit to discharge wastes is lodged by the proponent after the acceptance of the EIS by the Director, but is not approved until the EIA process has been

⁸ DEC website.

fully concluded. Conditions for monitoring the impact of the activity are set out in the permit, which also sets the basis for an environment management and monitoring program (EMMP).

31. **Applicability of requirements.** According to the EIA procedures, the project's outputs 1 and 2 do not fall within the definition of Level 2 or 3 activities, and will not require EIS. Some Level 1-category activities may be regulated by Provincial governments, and may be required to have in place a voluntary Code of Environmental Practice to manage environmental impacts. However, in reviewing laws passed by the five pilot provinces targeted for project interventions, there does not appear to be any requirement for a Province-level EIA or environmental permit. Further verification and clarification of Provincial requirements for environmental compliance should be sought during project implementation.

32. For output 3, extending the radio communications network to facilitate early warning for natural disasters and extreme climate events will likely be Level 1 activities. This will need to be confirmed during implementation.

B. ADB Safeguard Policy and Procedures

33. The ADB Safeguard Policy Statement 2009 (SPS) includes safeguards for environment, involuntary resettlement and indigenous peoples. The objectives of the SPS are to: (i) avoid adverse impacts of projects on the environment and affected people, where possible; (ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and (iii) help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

34. **Safeguard requirements.** For all three safeguard areas, the SPS defines a process of screening, impact assessment, planning, and mitigation that is intended to address the adverse effects of projects throughout the project cycle. Under the environment safeguards, projects are categorized according to their potential level of risk or impact. Category A projects are those likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works.

35. Category B projects are those that have potential adverse environmental impacts that are less adverse than category A projects, impacts are site-specific, few if any are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. Category C projects are likely to have minimal or no adverse impacts. Category A and B projects require environmental assessment; being EIA for Category A and initial environmental examination (IEE) for Category B.

36. For environmental safeguards, a major focus is on the inclusion of an environmental management plan (EMP) that defines mitigation measures, monitoring programs, cost estimates, budgets, and institutional arrangements for implementation. The appropriate level of assessment must be undertaken during project preparation, and the EIA or IEE is cleared before appraisal and approval by the Board.

37. **Sector approach.** This project is being treated similar to a sector investment. The nature of sector project lending is that the types of activities to be undertaken and types of subprojects to be implemented are known in general terms but only a small number of subprojects may be identified at the project approval stage. Subprojects can be included in the sector project provided they meet the selection criteria to be agreed with government and development partners, including environmental and social criteria. A sample subproject--usually for the most sensitive or complex component--is prepared following the due diligence

requirements and appraised prior to approval of the investment. From a safeguards perspective the sample subproject demonstrates application of the environmental assessment and review framework (EARF).

38. The sector approach is suitable because:

- (i) Specific designs for output components, at specific sites, are not yet known. The specific interventions will only be identified after a more detailed process of community consultation, and vulnerability mapping and assessment, has been carried during the initial implementation phase of the project; and
- (ii) The proposed components include only category B and C activities. Physical works i.e. category B activities include: structural improvements to selected infrastructure for climate resilience; small-scale community and household focused facilities (e.g., installation of 5,000 liter water tanks and gutters/spouts in households that have tin roofs, re-location of pit latrines or installation of VIP latrines; improvement of pilot small-scale food production, processing, preservation and storage methods; improving access to markets through improved maritime transport services). The category C activities are the “soft” capacity-building interventions.

39. Following the community consultation and vulnerability mapping and assessment process, but prior to final selection, candidate subcomponent interventions will be screened and evaluated against designated environmental selection criteria.⁹ Subcomponent interventions that meet the environmental criteria will then be approved in principle by the project steering committee (PSC) and ADB. Prior to final approval by ADB, the environmental assessment and review process as outlined in this EARF will be undertaken for all candidate subcomponents.

3. OVERVIEW OF COMPONENTS AND ENVIRONMENTAL IMPACTS

A. Profile of Selected Provinces and Islands

40. Specifically for output 2, case study provinces have been identified as East New Britain, specifically the Duke of York islands (Mulim, Mioko, Utuan and Kerewara), Manus, (specifically Ponam, Andra and Ahus islands) and Milne Bay, specifically the Trobriand Islands (Kiriwina, Munuwata and Kaeleuna). Maps showing the location of these provinces and pilot site locations can be found in Annex 2. Annex 2 also contains population statistics from the 2011 census. For each case study province, the physical, ecological and socio-economic environments are described below.

1. East New Britain – Duke of York Islands

41. The Duke of York island group located at (4.2° south and 152.5° east) comprises 13 islands with a total land area of 58 km². The four pilot site islands are all small and low lying, and situated to the south of the main Duke of York Island. Combined, the four pilot islands have a total population as per the 2011 census of 3,148¹⁰, which is considered¹¹ to be a very high

⁹ Subcomponent activities have already been screened and selected from a longer list of possible project interventions, and have been found to be environmentally acceptable. The screening that will take place during the implementation phase will basically be a confirmation that the proposed actions identified and prioritized by the communities conform to the list of accepted activities that have already been selected for inclusion in the SPCR.

¹⁰ The population of the whole Duke of York Group is estimated to be approximately 10,000.

population density. The entire Duke of York group is subject to threats from rising sea levels and as they also lie in an area of seismic instability, so they are highly vulnerable to the impacts of natural disasters. Administratively, the islands come under the jurisdiction of Kokopo District, and form part of the Duke of York Rural LLG.

42. According to the PNG Rural Development Handbook, the Duke of York group is considered a high income area, with both rainfall (average 2,500 mm per annum) and soils conducive to agricultural production. The main products traded or sold for cash income include; copra, cocoa, fresh fruit and vegetables (including bananas, taro, sweet potato, cassava, coconut), fish and poultry. Tourism is also increasingly becoming an important component of the local economy. There are several small local guesthouses and the Nanuk Island National Park in the Duke of Yorks. The islands are one to four hours travel by boat from Kokopo, which in the local context, is considered to give the island's residents good access to a major service centre (Kokopo).

43. In 2000, there was a push by local government to encourage Duke of York islanders to consider moving to the mainland ahead of grave fears that the region's seismic instability and rising sea levels could (or even would) cause inundation of coastal villages. While the immediacy for such a move appears to have waned somewhat, there are however local reports that traditional fishing grounds are moving further offshore. There are also some fears that the new technology and approaches to be utilized for seabed mining activities proposed by the Nautilus mining company (Solwara I) may affect the long-term health of the fishing grounds.¹²

2. Manus - Ponam, Andra, and Ahus Islands

44. Manus Province, located north of mainland PNG (2.1° south and 147° east), in the west of the Bismarck Archipelago, is composed of around 18 inhabited islands and atolls, the biggest being Manus Island which contains the largest remaining area of forest in the Admiralty Islands, (around 52,000 hectares). Manus has always been on the margins of PNG, both geographically and in terms of politics and government.

45. The northern coastline of the main Manus Island is fringed by barrier reefs, with several off shore islands to the east: Ponam, Andra, and Ahus (with a combined total population of 1626 as per the 2011 census). Manus sits just two degrees south of the equator and is one of the hottest parts of PNG. The normal north-west winds blow from November to February and are accompanied by heavy rains. Fishing in deep sea is impossible, so people must resort to the near shore, or on the larger islands, to rivers. Gardening is also affected and food supplies may decline. The south-east winds blow from June to October, and are associated with drier, sunnier weather, when fruits ripen and fishing is possible. These seasonal patterns are increasingly affected by the El Nino and La Nina climate change oscillations, so that local people can no longer predict what the weather will be.

¹¹ PNG Government: The Rural Development Handbook, 2000

¹² There is a significant amount of material about the project is available on the internet.

46. Manus has only one main road on the north-eastern side of the island, apart from poorly built tracks and logging roads which deteriorate quickly. There are very few shipping services, and most villages rely on small dinghies to reach the capital Lorengau. Lack of cash income is directly related to the difficulties of getting fresh produce and fish to markets. Poverty levels are increasing. All over PNG, poverty is concentrated in rural areas, particularly in areas that are mountainous, have high rainfall, poor soils, or like Manus, on small islands. Here the poorest people have limited access to health, education, and information services, and depend mainly on subsistence agriculture, hunting, gathering and fishing to meet household needs. While poverty indicators for Manus indicate that the province has a lower percentage of rural poor than many provinces, nonetheless, 82% of the population is classified as poor, despite the relatively large contribution of remittances from urban migrants working elsewhere in PNG.

47. Ponam, Andra and Ahus off-shore islands have few productive resources and little land. What land they do have is of poor quality. As a consequence, in the past, in order to survive, these villagers depended almost entirely upon trade and exchange with others inland, or on the coast of the main Manus island, such as with the village of Tulu. In pre-colonial times the circle of offshore islands around the main Manus Island had an integrated economic system based on local specialization in the production of goods. There were two types of specialization, ecological and social.

48. Villages built on off-shore islands with little land such as Ponam, specialized in transport, fish, lime and other marine products, while those on the main island specialized in gardens and sago production. There was a system of patents, with the right to manufacture certain specialties or exploit certain natural resources or trade routes, vested in lineages or villages, and recognized by other communities (for example, the monopoly on lime production in Andra Island stems from branching *Acropora* corals - used to chew with betelnut).

49. With colonialization and labor recruitment to plantations and government service, Manus ceased to be an independent system of interdependent islands and villages tied by complex arrangements of trade and exchange, and became a dependent outlier of the main PNG economy. The old regional economy has disintegrated, leaving a collection of paired mainland starch-producing communities and off-shore island fish-producing villages, trading in essentials. While betel nut and marine products provide a small cash income to the off-shore islanders, only the wealthier can afford the transport costs to Lorengau, the provincial capital, or other larger markets.

50. Environmental organizations such as Wildlife Conservation Society are assisting islanders on Andra to develop coral farming projects with the aim of providing a sustainable means of maintaining the coral lime trade. This contributes to livelihoods while relieving extractive pressure on reefs. Other marine production is also being encouraged with the aim of maintaining healthy reef systems into the future.

3. Milne Bay – Trobriand Islands

Within Milne Bay province (located 8.7° south and 150.9° east), the Trobriand Islands are located in the Massim region, about 193 km north of the eastern tip of the PNG mainland. The archipelago consists of about 22 flat, raised coral atolls of which seven are inhabited. The

people in all these islands speak a common language, Kilivila. Most of the population of more than 36,800 lives on the main island of Kiriwina.¹³

51. The islands which are included as pilot locations for the project are Kiriwina (the largest island), Kitava (an island to the 25 km east of Kiriwina), Kaele'una, a large flat island to the west of Kiriwina, and the smaller Munuwata Island, south west of Kaele'una. Rainfall is over 4,000mm per year, but smaller islands are prone to drought when dry seasons become unusually long, as occurs during El Niño years.

52. Most of the islands are covered with secondary re-growth forest, and grassland resulting from clearing and burning for gardening and hunting. During World War II, land and air bases were built in Milne Bay by the Allies to protect New Guinea from the Japanese attacks. On Kiriwina, scarce and precious agricultural land was buried by airfield construction, and there was much destruction of villages, mission stations and plantations. Most of the Trobriand Islands have high population densities of around 130 persons/km² and underwater fresh water lens, which provide water from wells and waterholes. These characteristics are typical of the region. On Kiriwina Island, there is significant in-migration from other islands and provinces.

53. Most transport is by outboard motor boats (dinghies known as banana boats), and canoes powered either by sail, or outboard motor (except on Kiriwina which has some roads of crushed coral). There are a few cargo work boats and trawler sized passenger boats, but shipping services are irregular and expensive. Many people on small islands require up to four-six hours to reach the nearest service center. Most people are gardeners and fishers and those on Kiriwina, and Kaeleuna earn moderate incomes from the sale of fresh food, betel nut and fish. Some families also receive remittances from relatives working in other parts of the country. Trobrianders depend mainly on coconut and fish as their main source of food, practicing agriculture in the form of moderate intensity mixed staple cultivation, but poor soils and high rainfall are constraints on farming. Some smaller islands are not self-sufficient in food and livelihoods are maintained through trade.

54. Trobriand Islands society is renowned for its carved outrigger canoes and navigation skills, its elaborate exchange systems where men trade shell valuables in the regional kula ring, and women provide skirts and banana leaf bundles for mortuary and other exchanges. Yam growing expertise, aided by garden magic, is highly valued, and each gardening season culminates in huge yam festivals at harvest time. A yam house, which is filled, reflects the wealth and prestige of its owner. Other crops such as giant taro, sweet potato, bananas, tapioka (cassava), aibika, tulip, pumpkin, guavas, mangoes, and coconuts are also grown. Fishing is also highly developed and very important to Trobriand diets. Shellfish and shells are also collected for sale.

¹³ The 2011 Census records the population as 36,891 with over 30,000 living on Kiriwina alone. Other common sources of information show the total Trobriand population as low as 12,000 or as high as 50,000.

55. Trobriand society is organized around sub-clans (dala), each of which is assigned to one of four matrilineal clans (kumila) which cut across geographical and local divisions, and are scattered throughout the islands, normally represented in most villages. Each of these clans has a different totem that may be a bird, animal or fish. A person becomes a member of his/hers mother's clan by birth. Members of the matri-lineage own land and other property in common. The most dramatic aspect of Trobriand culture, which sets it apart from most other Melanesian cultures is the system of hereditary hierarchical ranking. The highest rank belongs to people from a lineage called the *Tabalu*, which is headed by the paramount chief who even today retains considerable power and influence. There are other chiefly lineages from which the other chiefs are drawn who rule tribal areas. Villages are built around a central square or plaza, surrounded by a circle of small houses, each occupied by a single family, or used to store yams.

B. Project Components and Potential Impacts

56. This section provides an overview of the activities included in outputs 1, 2 and 3.¹⁴ The EARF presents and evaluates the activities with respect to possible impacts and requirements for environmental assessment and clearance. The candidate activities broadly fall into one of two categories: (i) subcomponent activities that entail some physical works or environmental alterations, in which case some environmental impacts may be expected; and (ii) those activities that involve no physical works or alterations to the environment, and thus will have no environmental impacts. The component activities are presented in Table 1. For each candidate activity, the table shows: (a) whether or not the action involves physical works or environmental alterations; (b) the nature of possible or expected environmental impacts (if any); and (c) whether there will be a requirement for further environmental assessment. Additional comments are also provided about the specific nature of any expected impacts.

57. In anticipating environmental impacts, candidate subcomponent screening will cover three aspects: siting, construction, and operations.

58. Candidate activities, as identified in Table 1, have been restricted by the selection criteria developed for the project. By this process, some mechanisms for environmental protection are already put in place, and in fact, the interventions are inherently intended to yield environmental and social benefits, especially in terms of improved resilience to the expected impacts of climate change. Improvements in this context span a number of sectors, including upgrade of water supply, drainage, marine transport, and environmental management. The potential environmental impacts of the proposed interventions vary significantly from one subcomponent to another, hence the requirement for subcomponent specific environmental review and assessment.

59. A range of options has been presented for candidate subcomponents that are designed to address climate change vulnerabilities, which are in turn tied to underlying climate change-related causal factors. Table 2 outlines the candidate subcomponent interventions that involve possible physical works or environmental alteration.¹⁵ The table identifies impacts, indicates corresponding mitigation measures for applicable project phases (design (including site selection), construction and operation), and provides additional comments about possible impacts. The mitigations described in Table 2 are to be considered as a general guide for

¹⁴ The component of output 3 (climate resilient infrastructure) is presented in detail in the initial environmental examination prepared for the Alotau Provincial Wharf upgrade subproject.

¹⁵ The table does not include the 'soft' interventions which do not involve physical works or environmental alteration (e.g., training, awareness-raising, and capacity building activities).

addressing the identified impacts, but will need to be refined to suit the particular development activities, once these are defined in a site-specific context.

Table 1 - Environmental Assessment Requirements for Output Components and Activities

Output/component	Physical works/ environmental alteration involved	Possible Environmental Impacts	Environmental assessment required?	Other Comments
Output 1: Community climate responsive investment approaches identified and implemented				
1.1 Prepare localized projections of climate change in 21 target island groups by Q1 2016.	NO	NONE	NO	--
1.2 Undertake vulnerability mapping in 21 vulnerable islands to identify priority investments that address climate change impacts by Q4 2016.	NO	NONE	NO	--
1.3 Establish a CRCTF to complement the financing of investments identified during the vulnerability mapping and planning process by Q3 2016.	NO	NONE	NO	--
1.4 Based on vulnerability assessment results, supply and install 200 water supply and 100 sanitation facilities in the five target provinces by Q4 2017.	POSSIBLY	Possible impacts associated with facilities' siting and construction	UNLIKELY	Improved water supply is proposed, where possible guttering and tanks will be fitted to community buildings such as schools and health facilities. In most cases, a 5000 liter Tuffa tank will be the maximum size provided as it is the largest tank can be manhandled and installed without the use of lifting equipment. For sanitation facilities (VIP latrines), siting will be an important consideration and should follow guidelines established for Community Led Total Sanitation (CLTS) programs. Training in CLTS principles to be provided.
1.5 Develop emergency response strategies in target islands by Q4 2017.	NO	NONE	NO	--
Output 2: Sustainable fisheries ecosystems and food security investments demonstrated and piloted in nine vulnerable island and atoll communities				
2.1 Sustain the integrity of fishery ecosystems by implementing ridge to reef initiatives covering: (i) support for local MMAs, conservation and management plans, (ii) rehabilitate and establish coastal mangrove and sago forests in estuarine and coastal environs,	YES	Impacts may be associated with the following candidate activities: <ul style="list-style-type: none"> • introduction of new species of seaweeds, fishes, or invertebrates for mari-culture • coral nurseries—farming of corals for use in coral reef rehabilitation and 	YES	Corresponding impacts could include: <ul style="list-style-type: none"> • threats to biodiversity and ecology due to invasive species or genetically-modified organisms • unsustainable harvest of fish fry for grow-out • unsustainable harvest of trash fish for use as feed

Output/component	Physical works/ environmental alteration involved	Possible Environmental Impacts	Environmental assessment required?	Other Comments
(iii) demonstrate aquaculture, aquarium and mari-culture initiatives in managed reefs to supplement incomes and food sources, (iv) restock and protect coral reefs within marine managed areas, and (v) replant commercial tree species in the upper reaches of watersheds to reduce run-off and sedimentation loads of draining waterways.		lime production for betel nut • deployment of fish-aggregating devices (FADs) to promote greater fish catch • rehabilitation of mangrove and sago forests could lead to site disturbance in fragile coastal environments • reforestation activities with commercial tree species could introduce species unsuited to the local environment, or commercial forestry activities could be located on sites not suited to future harvesting, e.g. very steep slopes		• unsustainable harvest of corals for use as propagules for coral farming • increases in nutrient levels due to over-feeding • interference with navigation or inhibition of natural water flow (e.g., by crowded floating seaweed rafts) • improper management of FADs leading to over-exploitation of fish stocks • introduction of invasive species • unacceptable levels of site disturbance during reforestation activities
2.2 Food security initiatives supported in coastal and island environs including: (i) evaluate farming systems in pilot communities to identify periods of food insecurity and other production constraints, (ii) test alternative cropping options, farming practices and crop varieties to address the food insecure periods, (iii) support local research and supply multiplication farms and communities with appropriate planting material (e.g. drought tolerant taro), (iv) introduce new production techniques to prepare communities for anticipated climate extremes (e.g. mulching and composting), and (v) support initiatives in food processing to extend the storage shelf life of perishable food items destined for trade with island communities.	YES	Impacts may be associated with the following candidate activities: • Crop diversification, introduction of new crop species for agriculture • New cropping, soil, and water management methods • facilities construction (if any) • introduction of new food processing techniques / operations • introduction of new food storage techniques / operations	YES	Corresponding impacts could include: • threats to biodiversity and ecology due to invasive species or genetically-modified organisms (GMO) • loss of soil nutrients, erosion, introduction of pollutants, uncontrolled runoff • standard construction-related impacts • issues relating to waste management, wastewater treatment
2.3 Provide NGO support to facilitate the delivery of food security and fisheries ecosystems initiatives and build local capacities.	NO	NONE	NO	-

Output/component	Physical works/ environmental alteration involved	Possible Environmental Impacts	Environmental assessment required?	Other Comments
Output 3: Enabling framework for climate resilient infrastructure established and early-warning communication (or radio?) network expanded (or extended?)				
3.1 Capacity Building, including: (i) Support policy dialogue for the design and maintenance of port infrastructure	NO	NONE	NO	Work is confined to planning, policy guidance, training and similar “soft” interventions—no physical construction works will be included
(ii) Revise appropriate engineering standards to accommodate the impact of climate change in infrastructure design	NO	NONE	NO	Work is confined to planning, policy guidance, training and similar “soft” interventions—no physical construction works will be included
(iii) Build capacities of national and provincial port and wharf design specialists to incorporate economic returns achieved from incorporating climate resilience in feasibility studies.	NO	NONE	NO	Work is confined to planning, policy guidance, training and similar “soft” interventions—no physical construction works will be included
(iv) Develop options for the sustainable financing of port rehabilitation and upgrading taking into account climate change.	NO	NONE	NO	Work is confined to planning, policy guidance, training and similar “soft” interventions—no physical construction works will be included
3.2 Climate Resilient Infrastructure, including: (i) Expand radio network in target provinces through radio repeater stations and island receivers by Q4 2017;	NO	NONE	NO	All new transmission equipment to be fitted to existing towers – no physical construction works will be included
Output 4: Efficient Project Implementation and Management				
(i) Establish and operationalize the PMU	NO	NONE	NO	-

Table 2: Potential Environmental Impacts and Mitigation Measures for Output Components and Activities

Impacts/Vulnerability and Climate-Related Causal Factors	Candidate Interventions (activities)	Possible Impacts	Mitigation Measures	Other Comments
Food insecurity				
Rising temperatures, changing rainfall patterns, increases in crop pests	Improved land management-e.g., raised bed gardens, soil conservation on slopes and hills	No adverse impacts are anticipated	None required	Given the low terrain and lack of fertile topsoil on small coral islands and atolls, improved land management typically involves methods that help to enrich the soil, retain moisture, and prevent erosion.
	Improved agricultural methods-composting, Integrated Pest Management (IPM), control of pests and invasive species	Potential for inadvertent introduction of invasive species and alterations to natural gene pool	<ul style="list-style-type: none"> • <u>Design phase</u>: Identify appropriate IPM methods and biological control species to be used • <u>Operation Phase</u>: monitor bio-control species 	IPM is intended to provide natural chemical-free means of pest and invasive species control, and should not pose any threat of causing adverse impacts itself
	Drought- and salt-tolerant crops	Potential biosafety risks/impacts need to be assessed	<ul style="list-style-type: none"> • <u>Design phase</u>: Identify appropriate crop species that are compatible with local ecological conditions (e.g., native species or ones already present) • <u>Operation Phase</u>: monitor crops to ensure that no alterations in natural gene pool are occurring 	Introduction of locally available drought- and salt-tolerant crops could improve agricultural productivity under harsh conditions present on small islands; assuming non-invasive species are utilized, risk of impacts is minimal
	Improved income generation—alternative crops, for example, seaweed culture	Project sites need to be evaluated for suitability of this activity	<ul style="list-style-type: none"> • <u>Design Phase</u>: care in site selection; selection of appropriate species for culturing • <u>Operation Phase</u>: carry out environmental monitoring to ensure that seaweeds are not encroaching on natural habitats 	Culture of <i>Kappaphycus alvarezii</i> (<i>Eucheuma cottonii</i>) and <i>Gracilaria</i> spp. has shown success in many Pacific island countries, including PNG, and could provide additional local livelihood opportunities
	Improved transport of fresh food products	Influx of people to remote islands/atolls in excess of carrying capacity; increased pollution to marine waters; introduction of invasive marine or terrestrial species	<ul style="list-style-type: none"> • <u>Design Phase</u>: determine appropriate scheduling and capacity of vessels • <u>Operation Phase</u>: ensure regular cleaning and maintenance of vessel hulls to remove sessile algae and invertebrates; discharge bilge water appropriately; inspect vessels and utilize pest control for 	Remote island communities are hampered by lack of regular transport for bringing goods to and from market—scheduling of regular trips by a dedicated vessel(s), to serve all project locations, could improve food security, and create livelihood opportunities

Impacts/Vulnerability and Climate-Related Causal Factors	Candidate Interventions (activities)	Possible Impacts	Mitigation Measures	Other Comments
			minimizing risks of introducing invasive species appropriately	
	Improved communications	VHF radio waves pose a possible threat Possible noise and disruption to services during fitting of new transmitters/receivers to existing towers	<ul style="list-style-type: none"> • <u>Design Phase</u>: assess any potential risks of exposure to VHF radio waves and design and mitigate accordingly • <u>Construction Phase</u>: apply best engineering practices to minimize dust, noise, pollution and runoff • <u>Operation Phase</u>: operate facilities so that any hazardous wastes, solid wastes, and exposure to radio waves are properly managed 	VHF radios installed as part of an early warning system to assist in times of disaster; could also be utilized for general communications that could facilitate exchange of information useful for purchase, marketing, and delivery of foodstuffs
	Food preservation and processing (e.g., smoking and drying of fish)	Construction of processing facilities could cause increases in noise, dust, and water runoff during construction; potential for pollution during operation, and food safety hazards without proper controls in place	<ul style="list-style-type: none"> • <u>Design Phase</u>: ensure sites for new construction are selected to minimize impacts on the site due to any necessary vegetation clearing, excavation works etc. • <u>Construction Phase</u>: apply best engineering practices to minimize dust, noise, pollution and runoff • <u>Operation Phase</u>: operate facilities so that any hazardous wastes, solid wastes, are properly managed; ensure sanitary standards required for food industry (e.g., hazard analysis and critical control points [HACCP]) are maintained 	Small-scale food processing can generate income and improve food security
Water scarcity				
Changing rainfall patterns, rising temperatures	Installation of 5000-litre tanks with iron roofing, guttering, taps	Household demand (especially during dry season) should be assessed prior to installation, to ensure proper sizing of tanks	<ul style="list-style-type: none"> • <u>Design Phase</u>: assess water demand to design collection/storage capacity accordingly; provide for adequate maintenance capacity • <u>Construction Phase</u>: apply best engineering practices to minimize disruption of normal community activities, reduce noise and dust, and prevent loss of or damage to tanks. 	Given lack of viable potable groundwater or surface water resources on most small coral islands/atolls, this is the most likely viable alternative to provide a sustainable potable water resource

Impacts/Vulnerability and Climate-Related Causal Factors	Candidate Interventions (activities)	Possible Impacts	Mitigation Measures	Other Comments
			<ul style="list-style-type: none"> • <u>Operation Phase</u>: maintain equipment properly to safeguard the investment and ensure water does not pool and stagnate around the tank 	
	Improved wells	Improper site selection could cause problems in maintaining groundwater quality, due to saline intrusion and/or contamination by pollutants	<ul style="list-style-type: none"> • <u>Design Phase</u>: assess water quality/demand and the nature and capacity of the groundwater resources, to determine whether aquifer is of adequate size to support the demand • <u>Construction Phase</u>: apply best engineering practices to minimize introduction of pollutants into groundwater • <u>Operation Phase</u>: ensure that drawdown of aquifer stays within sustainable limits, to avoid saltwater intrusion 	Given limited groundwater resources on small coral islands/atolls, this option may only have limited application at a few sites; 'Improving' wells may be a matter of relocating them to more suitable sites, to avoid contamination of groundwater by sewage, nutrients, or saltwater intrusion
Water- and vector-borne disease (e.g., malaria, cholera, diarrhea)				
Rising temperatures, changing rainfall patterns	VIP (ventilated improved pit) toilets, composting toilets	Potential to increase the spread of vector- and water-borne diseases	<ul style="list-style-type: none"> • <u>Design Phase</u>: design should consider proper siting away from drinking water sources; appropriate technologies (VIP toilets, composting toilets) should be utilized to facilitate ease of maintenance and minimize exposure to pathogens • <u>Construction Phase</u>: apply best 	Correct siting of toilet facilities will be important to reduce water contamination and minimize the spread of water-borne disease; Conducting periodic testing of water quality can help to protect communities from contaminated water sources;
	Relocation of toilets away from water sources			
	Water quality testing			

Impacts/Vulnerability and Climate-Related Causal Factors	Candidate Interventions (activities)	Possible Impacts	Mitigation Measures	Other Comments
	Protection of water catchment and supply		<ul style="list-style-type: none"> engineering practices to minimize • introduction of pollutants into groundwater - follow with community involvement and training in CLTS principles and hand-washing awareness raising • <u>Operation Phase</u>: maintain facilities regularly as required; dispose of degraded wastes (e.g., sludge, compost) appropriately; regularly test quality of drinking water to ensure sources not contaminated by sewage and human waste 	protection of groundwater and minimization of spread of water-borne diseases can be achieved through measures mentioned above
	Culverts for drainage improvement	Installation of culverts could cause increases in dust, sediments, and water runoff during construction and operation	<ul style="list-style-type: none"> • <u>Design Phase</u>: ensure that culverts are properly designed and sited to effectively drain water-logged areas • <u>Construction Phase</u>: apply best engineering practices to minimize sediments and runoff • <u>Operation Phase</u>: conduct regular inspection and maintenance as required 	Provision of culverts to drain areas where water collects can reduce the spread of mosquitoes that carry malaria
	Vector control (mosquito nets)	No adverse impacts are anticipated	None required	World Health Organization (WHO) has distributed insecticide treated mosquito nets to most communities. Nets could be repaired, replaced, and treated as required. Need to ensure dangers of using treated nets for fishing or alternative uses is understood
Coastal erosion, saline intrusion, coral degradation				
Sea level rise, increased atmospheric CO ₂ , ocean acidification	Mangrove planting and management	Poor survivorship of planted mangroves due to unsuitable environment (especially salinity regime and substrate); introduction of invasive species	<ul style="list-style-type: none"> • <u>Design Phase</u>: sites for planting should be chosen based on their suitability to support mangroves, i.e., estuarine environments where mixing of salt and fresh water occurs; native mangrove varieties should be used to avoid introduction of invasive species 	In general, mangroves, which require freshwater influence, are not found on small low-lying coral islands and atolls; this intervention will only be a viable option to enhance the coverage of mangroves, for those sites where they occur

Impacts/Vulnerability and Climate-Related Causal Factors	Candidate Interventions (activities)	Possible Impacts	Mitigation Measures	Other Comments
				naturally and are under threat
Declining fisheries resources				
Rising temperatures, increased atmospheric CO ₂ , ocean acidification	Mangrove planting and management	Poor survivorship of planted mangroves due to unsuitable environment (especially salinity regime and substrate); introduction of invasive species	<ul style="list-style-type: none"> • <u>Design Phase</u>: sites for planting should be chosen based on their suitability to support mangroves, i.e., estuarine environments where mixing of salt and fresh water occurs; native mangrove varieties should be used to avoid introduction of invasive species 	Replanting of mangroves can restore an important fisheries breeding and nursery-ground
	Fish farming, mariculture	Potential for inadvertent introduction of invasive species, and alterations to natural gene pool; unsustainable harvest of fish fry for grow-out; unsustainable harvest of trash fish/by-catch for use as feed; increases in nutrient levels due to over-feeding; interference with navigation or inhibition of natural water flow (e.g., by crowded culture cages)	<ul style="list-style-type: none"> • <u>Design phase</u>: Identify appropriate species for culturing—should employ native species • <u>Operation Phase</u>: regular monitoring of populations of target species in the natural environment to avoid overharvesting; control use of feeds to reduce nutrient loading; coordinate with maritime authorities for proper placement of culture cages to avoid conflicts with navigation 	Potentially can improve food security and create livelihood opportunities, however possible impacts such as nutrient loading, alterations in water circulation, and introduction of invasive species need to be considered
	Deployment of Fish Attracting Devices (FADs)	Improper management of FADs can lead to over-exploitation of fish stocks	<ul style="list-style-type: none"> • <u>Design Phase</u>: locate FADs within zones where their use can be managed, and where natural fish stocks can be monitored • <u>Operation Phase</u>: conduct regular monitoring of fisheries stocks to determine allowable catch levels; regulate fishing activities; train fishers regarding proper use of FADs 	
	Establishment of coral nurseries for reef rehabilitation	Damage to natural coral reefs due to improper harvesting of coral propagules or overharvesting	<ul style="list-style-type: none"> • <u>Design Phase</u>: determine appropriate locations and species for sourcing of coral propagules; place coral nurseries within areas where they can be properly monitored, managed and protected • <u>Operation Phase</u>: conduct regular monitoring of corals in source areas; train communities for 	Nursery-produced corals can be used for coral rehabilitation and as an alternative source for betelnut lime—can help to improve severely degraded coral areas which are important nursery areas for marine life; improve functionality of coral reefs as

Impacts/Vulnerability and Climate-Related Causal Factors	Candidate Interventions (activities)	Possible Impacts	Mitigation Measures	Other Comments
			appropriate methods for coral farming	natural barriers to help attenuate wave energy to provide valuable coastal protection to vulnerable islands and atolls; and replenish corals that are harvested for use in lime production
	Post-harvest fish processing and handling	Construction of facilities for processing could cause increases in noise, dust, and water runoff during construction; potential for pollution during operation, and food safety hazards without proper controls in place	<ul style="list-style-type: none"> • <u>Design Phase</u>: ensure sites for new construction are selected to minimize impacts on the site due to any necessary vegetation clearing, excavation works etc. • <u>Construction Phase</u>: apply best engineering practices to minimize dust, noise, pollution and runoff • <u>Operation Phase</u>: operate facilities so that any hazardous wastes, solid wastes, are properly managed; ensure sanitary standards required for food industry (e.g., hazard analysis and critical control points [HACCP]) are maintained 	Improved processing and handling can reduce waste and spoilage, thereby reducing pressure on fisheries resources Programs to be coordinated with CIFDA
Landslides, flooding, storm surges and other disasters				
Increased frequency and intensity of extreme weather events, changing rainfall patterns and creating storm surges along exposed coastal areas	Disaster management plans	No adverse impacts are anticipated	None required	Improved planning and preparedness can help to alleviate the most immediate impacts of disasters
	Early warning systems	Hazards associated with VHF radio waves pose a possible threat	<ul style="list-style-type: none"> • <u>Design Phase</u>: assess any potential risks of exposure to VHF radio waves and design and mitigate accordingly • <u>Installation Phase</u>: apply best engineering practices to minimize dust, noise, pollution • <u>Operation Phase</u>: operate facilities so that any hazardous wastes, solid wastes, and exposure to radio 	Provision of improved capacity to monitor changing weather can help communities avoid major impacts, Improving mobile phone coverage is a low cost option to reach poor communities
	Disaster centers, emergency supplies and equipment			Improved preparedness can help to alleviate the most immediate impacts of disasters

Impacts/Vulnerability and Climate-Related Causal Factors	Candidate Interventions (activities)	Possible Impacts	Mitigation Measures	Other Comments
	VHF radios		waves are properly managed	Improved communications can help communities avoid major disaster impacts

4. ENVIRONMENTAL ASSESSMENT AND REVIEW PROCESS

A. Environmental Criteria for Selection of Interventions

60. Under the grant facility for this project, any component or activity that would be category A, i.e. interventions that are likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. This includes trans-boundary or cumulative impacts, will be excluded.

61. The selection criteria are attached as Annex 3. By adhering to the restrictions described below, the component interventions selected will be confined to either SPS categories B or C, requiring an IEE-level environmental assessment or a due diligence report (DDR) or environmental audit, respectively.¹⁶

62. Under outputs 1 and 2, all interventions under the project will be specifically restricted to include only those activities that either: (i) involve no construction of infrastructure, or physical alterations to the environment; or (ii) if physical works are required, these will be of small scale with minor impacts that can be easily mitigated or managed.

B. Procedures for Environmental Assessment

63. There are nine steps to be conducted for the environmental assessment and review process for components as outlined below.

1. Screening

64. Initial screening is undertaken to determine the likely level of environmental impact. For eligible subcomponent interventions, an initial classification is useful to focus attention on areas of potential environmental concern and to consider mitigation strategies. A screening level rapid environmental assessment (REA) tool can be used; the ADB developed REA checklists can be used for this.¹⁷ Similar checklists could be employed in screening of individual subcomponent interventions, once these have been identified for specific sites by the target vulnerable community. Subcomponent categorization will identify which of the next steps for assessment and review are relevant to each activity/component.

¹⁶ Category A components and activities are not eligible for funding under the project. Category B components and activities are likely to have fewer adverse impacts than category A subcomponents, are site-specific, and impacts can be readily addressed through mitigation measures. For Category B activities, an IEE and environmental management plan (EMP) are required. Category C subcomponents are unlikely to have adverse environmental impacts and require no assessment. However environmental implications still need to be closely reviewed. Categorization is established by defining the most environmentally sensitive component and the extent and duration of the potential impact.

¹⁷ ADB website. www.adb.org/sites/default/files/.../environmental-assessment-guidelines.pdf

2. Scoping

65. Scoping is the second step in the process, defining the boundaries and time scale for assessing impacts, mitigation options, and monitoring. Some subcomponent interventions may require the analysis to go beyond the life of the infrastructure and address post closure or rehabilitation issues. Most of the climate change-related subcomponent interventions of the project that will involve small-scale infrastructure improvements will require environmental assessment that will focus predominantly on construction, but this must be reviewed on a case by case basis. At this step the inception report will be submitted to DEC, along with application for environmental permit (for any Level 2 and 3 activities), for determination on assessment requirements according to the EPAR. For those activities not requiring assessment under EPAR, the DEC may impose conditions on the permit that will need to be reflected in the construction/civil works contract. Activities not requiring assessment under EPAR may still need assessment according to SPS, the DDR will be completed for these subprojects/activities.

3. Assessment

66. The environmental assessment identifies and addresses the environmental impacts and risks associated with a project (or its components/activities). At an early stage of preparation, the potential direct, indirect, cumulative and induced environmental impacts on and risks to physical, biological, socioeconomic, and physical cultural resources will be identified and their significance and scope determined. The assessment is conducted in consultation with stakeholders, including affected people and concerned NGOs.

67. A review and analysis of baseline environmental conditions needs to be undertaken. Documenting baseline environmental conditions includes land use, water and air quality, biodiversity, soils, geology, topography, climate, physical cultural resources, and socioeconomic conditions. This step involves fieldwork to document existing site conditions, as well as the review of relevant reports. In some instances, detailed testing is warranted for conditions such as existing water quality. In all project sites, initial vulnerability assessments to be undertaken during project implementation will include soil/water analysis and vegetation mapping. Predicting likely impacts requires a thorough analysis of potential environmental impacts and proposed mitigation measures. Any environmental issues that are likely to have an inequitable impact on women or disadvantaged groups need to be given particular attention with appropriate measures put in place to either reduce this impact or provide adequate compensation.

68. The assessment documentation may group together several activities or interventions in one geographic area. The IEE level assessment includes the following key elements: (i) an Executive Summary; (ii) a description of the existing policy, legal, and administrative framework for environmental compliance; (iii) description of the project or subcomponent; (iv) description of the environment; (v) anticipated environmental impacts, and mitigation measures; (vi) description of requirements for information disclosure, consultation, and participation; (vii) description of requirements for a grievance redress mechanism; (viii) an environmental management plan; and (ix) conclusion and recommendations. An annotated outline table of contents for an IEE is presented in Annex 4.

4. Public consultation and information disclosure

69. Consultation and disclosure are required throughout the environmental assessment cycle, providing not only the mechanism to inform the community of the proposed subcomponent, but also to receive inputs into potential impacts and appropriate mitigation measures.

70. Proposed project interventions will be identified through a comprehensive household and community vulnerability/capacity assessment and community-led risk evaluation and priority identification process. Consultation with relevant government officials, the business community, and NGOs will assist in providing a number of perspectives. Direct consultation with and accessible information disclosure to any people affected by the proposed subcomponent intervention is imperative to understanding the existing situation and providing effective means to mitigate any environmental impacts for people in the immediate area. A more in-depth description of required public consultation and information disclosure processes is presented in Section 7.

5. Grievance Redress Mechanism

71. A grievance redress mechanism (GRM) is set up to: (i) provide support to affected persons on environmental issues or problems arising from project actions and their associated impacts; and (ii) provide a means by which the various conflicting stakeholders may be consulted, and a negotiated agreement reached.

72. In preparing for project actions, it is essential and expected that all stakeholders are consulted through census, environmental assessment and socioeconomic surveys, focus group discussions, and other meetings. The project procedure manual that shall be developed and used to undertake household/community vulnerability mapping and the development of community climate change risk management (adaptation) plans shall include a communications plan that outlines a system of public consultation, awareness and disclosure of environmental and climate change concerns and plans should be formulated targeting APs and host communities. Community awareness meetings will be conducted to ensure that all community members are adequately informed of their rights with respect to the grievance redress process.

73. During the course of project implementation, it is possible that people may have concerns with the project's environmental performance including the implementation of the EMP. Issues may occur during construction and again during operation. Any concerns will need to be addressed quickly, and without retribution to the affected person. Thus the grievance redress mechanism is intended to be simple, transparent and equitable. A more in-depth description of required GRM process is presented in Section 8.

6. Environmental Management Plan

74. The EMP provides the implementation mechanism for mitigation of potential environmental impacts. The document needs to provide practical and relevant means to meet the specified environmental safeguards requirements. It includes (i) identification of impacts; (ii) a description of how each impact will be mitigated; (iii) delineation of roles and responsibilities; (iv) description of the monitoring program that will be used to ensure that the responses to possible impacts have been adequate; and (v) reporting mechanisms. When a subcomponent intervention is in the implementation phase the EMP will be reviewed and updated as needed, to ensure its relevance.

75. An EMP template is provided in Annex 5. The template includes descriptions of the various elements enumerated above. It is expected that for all project interventions that are classified as category B, a detailed EMP based on the assessment, will be completed.

7. Implementation Mechanisms

76. It is essential to define implementation arrangements at the outset. Responsibilities as allocated in the EMP are to be understood and agreed to. The capacity of each of the players needs to be evaluated as a part of the environmental assessment process, with appropriate training or capacity development incorporated into the subcomponent to underpin effective implementation. Relevant EMP mitigation measures are to be incorporated into the bidding documents, with the contractor to describe and cost them. Relevant penalties must be included within the contract to ensure compliance. Prior to the commencement of works, the contractor will prepare a contractor EMP and a health and safety plan for approval by the program management unit (PMU). The monitoring process must be practical and effective, providing an assurance that safeguard measures are implemented.

77. In the EMP template provided in Annex 6, indicative descriptions are provided for responsible parties who are to carry out various functions. A more detailed description of the overall institutional arrangements and responsibilities for the project are provided in Section 6.

8. Costing

78. Costing of mitigation and monitoring measures ensures that adequate resources will be available to cover the expected costs for environmental compliance. Costs covered within civil works budgets should not be double-counted; this will require good communications between the environmental assessment staff within the PMU and the technical project designers. Estimation of costs for environment-related functions should also include monitoring that will be undertaken to establish baseline parameters where necessary, and to ensure compliance of the contractor with the approved EMP. Costing requirements are shown in the EMP template presented in Annex 5.

9. Monitoring and Reporting

79. Monitoring and reporting are the final steps in the process, although all steps require documentation to compile the final report. The preparation of environmental assessment documentation will be based on the SPS and will also comply with the requirements of PNG laws and regulations, as needed. An indicative description of monitoring and reporting requirements is provided in the EMP template presented in Annex 5. Disclosure will comply with the ADB Public Communications Policy 2011 and the requirements of the Environment Act.

5. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

A. Implementation Arrangements

80. An overview of the institutional arrangements for project implementation is presented in Figure 5.1 and summarized in Table 3. A detailed account of the overall implementation arrangements can be found in Annex 6. Responsible parties for implementation of the EARF are identified in Table 4.

Figures 5.1 - Institutional Arrangements and PMU

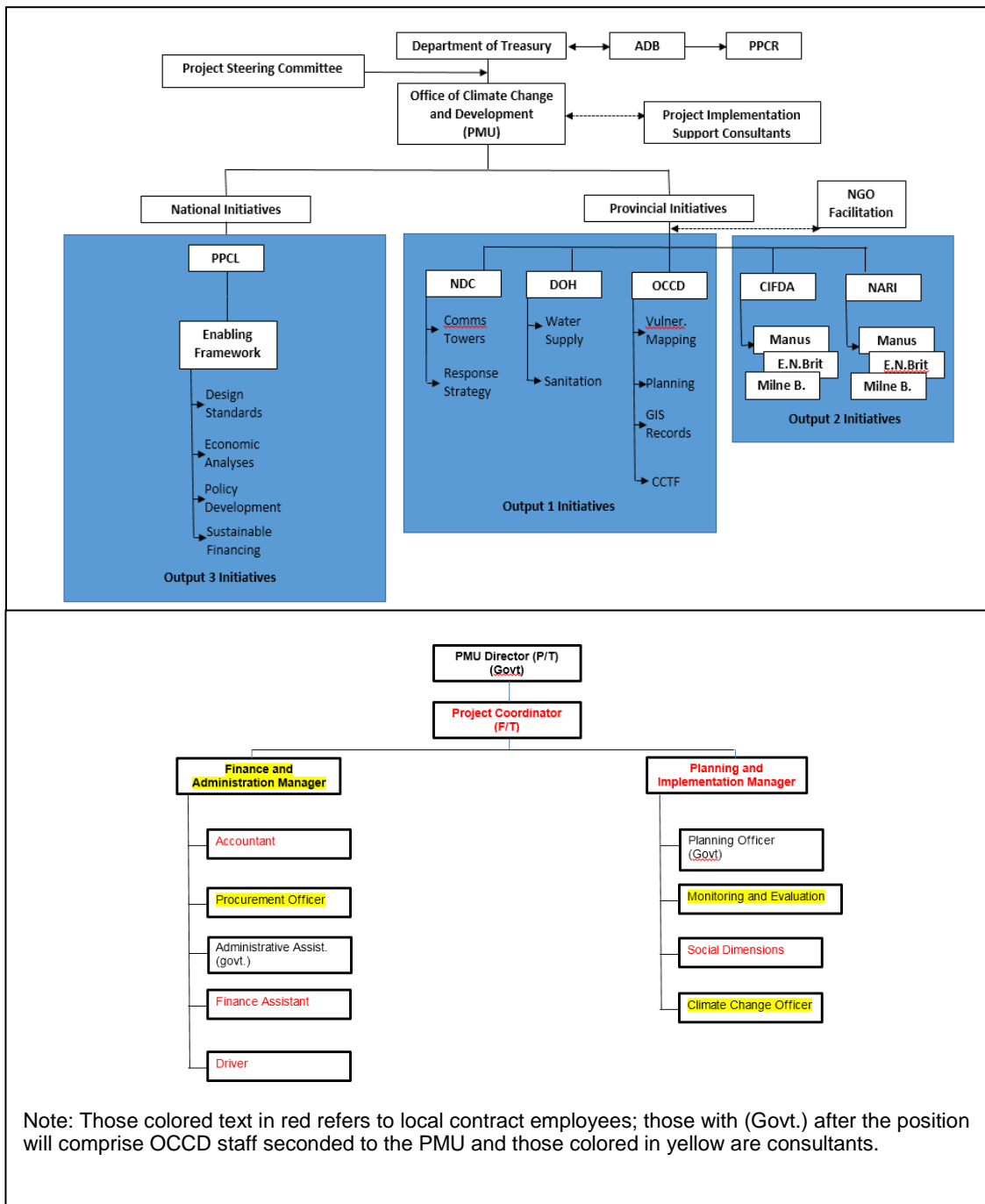


Table 3 – Summary of Project Implementation Arrangements

Project Implementation Organizations	Management Roles and Responsibilities
Executing Agency - Office of Climate Change and Development (OCCD)	Responsible for overall management and coordination of the Project.
Program Management Unit (PMU)	Established within OCCD to manage the Project and be responsible for overall implementation performance.
National Steering Committee	At national level, a Steering Committee will guide the overall project implementation. The Steering Committee shall be chaired by Executive Director or designated representative from the Office of Climate Change and Development and have representatives from the Department of National Planning and Monitoring (alternate chair), with committee members appointed from Department of Treasury, Department of Health, Coastal and Inland Fisheries Development Authority, National Disaster Centre, PNG Ports Corporation Ltd. and National Agricultural Research Institute. The secretariat of the steering committee shall be the PMU established within OCCD.
Provincial Advisory Committees	Five Provincial Advisory Committees (PACs) will be established in the participating provinces. PACs will be chaired by the Deputy Administrator responsible for the agricultural and natural resources sector in each province. The Deputy Chairperson will be the Head of the Provincial Administration Office.
Implementing Agencies	There will be four implementing agencies for the project: <ul style="list-style-type: none"> • At the national level, OCCD will be responsible for the implementation coordination of Outputs 1 and 2 initiatives. Under Output 1, OCCD will be responsible for the recruitment of facilitating NGOs in the five provinces and for coordinating the vulnerability assessment work on the 21 target vulnerable island communities. • The Coastal and Inland Fisheries Development Agency (CIFDA), and the National Agricultural Research Institute (NARI) will jointly implement the proposed initiatives under Output 2. • Output 3 will be implemented by PNG Ports Corporation Limited (PPCL) while the early warning and communications network will be implemented by OCCD with technical support from the National Disaster Center. • At the provincial level, the Administrator's office in each participating province will be responsible for coordination of implementation activities in each of the first two components. As responsibilities are confined to coordination, it is not considered necessary to establish an implementation structure specifically for project implementation.
ADB	As the multi-lateral development agency administrator of the PPCR, ADB will: <ul style="list-style-type: none"> • Administer the CIF/PPCR grant; • monitor program implementation arrangements, disbursement, procurement, consultant selection, and reporting; • monitor schedules of activities, including funds flow; • review compliance with agreed procurement procedures; • review compliance with loan covenants; • monitor effectiveness of safeguard procedures; • analyze the outcome of the capacity building and training programs; • monitor conformity with ADB anti-corruption policies; • undertake a periodic review mission; and • undertake a joint midterm review mission with the Government.
CIF/PPCR	Provide grant financing to the Government of PNG for the implementation of the 'Building Climate Resilience in PNG Project

B. Implementation Responsibilities

81. Each of the different agencies involved in implementation of the project have roles and responsibilities for ensuring that EARF is implemented. These are set out in Table 4.

Table 4 - EARF Implementation Responsibilities

Organization	EARF Implementation Responsibilities
Executing Agency	<ul style="list-style-type: none"> - Overall responsibility for management of the Project. - Submit subcomponent IEEs to ADB. - Submit any updates or changes to subcomponent IEEs to ADB for approval. - Chair of the project steering committee. - Establish appropriately staffed and qualified PMU with responsible PMU.
PMU - within OCCD	<ul style="list-style-type: none"> - Recruit qualified international design and supervision consultant firms for environmental inputs, and recruit environmental specialist for PMU. - Update activity and subproject EMPs or IEEs if required after detailed design stage. Any changes need to be submitted to the executing agency, which will submit to ADB for approval. - Ensure that all relevant EMP mitigation measures are integrated into civil works bidding documents, along with financial penalties for breaches and the requirement for the contractor to pay for mitigation measures. Provide training to contractor prior to preparation and submission of contractors' construction EMP. - Assess the contractor's proposed environmental mitigation measures and costs, and its capacity to implement them as a part of the bid evaluation process. - Submit contractor EMPs to PSC for review, comment and endorsement - Approve contractor's EMP. - Provide contractor with induction prior to commencement of any site works. - Monitor contractor's compliance with the EMP. Undertake necessary actions to address noncompliance of EMPs. - Maintain regular communications, coordination and support to other relevant government agencies on environmental matters. - Engage environmental consultants to support environmental assessment as required. - Submit monitoring reports to EA and ADB and provide inputs on safeguards to quarterly progress reports
Implementing Agencies	<ul style="list-style-type: none"> - Overall responsibility for applying the EARF to prepare each IEE and EMP for subcomponents. - Ensure compliance with Environment Act 2000, EPAR and SPS. - Submit environmental assessment (IEE or DDR) to ADB and DEC for clearance. - Obtain necessary permits to proceed with each subproject.
Contractor(s)	<ul style="list-style-type: none"> - Prepare contractor EMP and health and safety plans to meet the environmental mitigation measures outlined in the bidding document. - Plans to be approved prior to works commencing the CEMP will be a binding document covering the following aspects: name of the supervising engineer for the contractor and nomination of the environmental manager and back-up person for the contract duration, scope of works and plan of works, machinery and equipment to be brought to the site, quarry sites used for any construction materials, environmental protection work procedures, staff training for contractor EMP compliance, and monitoring contractor EMP implementation and providing PMU with monthly reports. Implement GRM as appropriate and maintain a complaints/grievance record. The records will be the subject of monitoring. - Implement contractor EMP with the assigned staff member responsible for monitoring measures in place, and the effectiveness of these measures. - Report any environmental or health and safety incident to PMU.

Organization	EARF Implementation Responsibilities
ADB	<ul style="list-style-type: none"> - Review and approve IEEs - Review and approve quarterly project and EMP monitoring reports - Monitor and supervise client's environmental performance throughout the project cycle. - Disclose environmental assessments and monitoring reports on the ADB website. - If a client fails to meet safeguard obligations, ADB will seek corrective measures and work with the client to reinstate compliance.

82. The PMU, through the support consultants, will have the most direct responsibility for implementing the EARF. The PMU will engage qualified environmental and social safeguard specialists who will undertake the following tasks:

- (i) Undertake rapid environmental assessment screening of each candidate subproject and general intervention proposed by PSC for feasibility, and classify according to ADB categories, reporting to the PMU; ensure compliance with safeguard requirements and ensure that appropriate measures are in place to avoid, minimize, mitigate, and compensate for adverse environmental impacts.
- (ii) Conduct the IEE or DDR/environmental review for future selected candidate interventions, with the assistance of project implementation consultants; prepare required IEE documents and provide to PMU.
- (iii) Conduct consultation and disclosure events during project preparation and implementation, facilitating informed participation.
- (iv) Coordinate the grievance redress mechanism in accordance with the procedure outlined in EARF.
- (v) Review and approve each contractor EMP, including the monitoring aspects of the EMP.
- (vi) Implement all environmental monitoring as outlined in each subproject's EMP.
- (vii) Preparing quarterly EMP progress reports for inclusion in the project quarterly progress reports for PMU to submit to PSC.
- (viii) Liaison and communication with stakeholders and general public on objectives of subcomponent intervention, and environmental risks, mitigation measures, and outcomes.
- (ix) Submit an environmental completion report to the ADB within three months of completion of subprojects; detailing all aspects of environmental performance compared to the EMP, and measures in place to mitigate potential impacts during the operational phase.
- (x) Maintain regular communications, coordination and support to other government agencies on environmental matters.
- (xi) Ensure that the TOR of the environment specialist(s) are carried out in full, to include the following tasks:
 - Develop guidelines and design/implement training programs for the integration of climate change considerations into the EIA process based on the guidelines developed by the SPREP;
 - Assist in facilitating participatory planning and governance activities and the implementation of the initial environmental examination recommendations; their proposed construction technology, and project implementation plan to identify any potential adverse impacts;

- Regularly review and report on the impact of project actions on the environment and determine the nature and extent of environment impact, if any, caused by sub-projects;
- Assist the OCCD in reviewing all infrastructure designs, their proposed construction technology, and project implementation plan to identify any potential adverse environmental impacts;
- Undertake training of staff of the PMU, as well as other relevant partner agencies and institutions to carry out initial environmental examination for SPCR interventions, awareness-building of and motivating stakeholders/ beneficiaries on environmental issues;
- Monitoring of Environmental Monitoring Plans and compliance progress toward the expected outcomes, verify monitoring information to identify adverse environmental impacts, document results, identify the necessary corrective actions, and reflect them in a corrective action plan;
- Take responsibility for the effective transfer of climate resilience principles to other key PMU staff, and other stakeholders in the detailed design, construction and operation/maintenance of projects; and
- Assist and cooperate with other specialist members of the PMU under the direction of the OCCD.

83. The TOR for the environment specialist has been prepared and is included as Annex 7.

C. Staffing Requirements and Budget for EARF Implementation

84. Given current limited capacity within PNG institutions at the national, provincial and local (district, local level government, and ward) level, it is determined that additional support will be needed to satisfy environmental and social safeguard compliance requirements associated with project interventions. It is recommended that this be accomplished through the contracting of consultants with the requisite skills and expertise, who will be allotted sufficient time to carry out all required safeguard functions. It is understood that in the course of providing this support, the consultants will at the same time transfer skills and knowledge in order to build the capacity of personnel within the host institutions.

85. The inputs that will be needed to staff within the PMU are detailed in Table 5. Based on the unit inputs detailed in the table, indicative costs have been calculated. Provision needs to be made in the project budget, to ensure that sufficient resources are committed to cover these required inputs.

Table 5 - Requirements for PMU Staffing and Associated Costs

Personnel	Total Person-Months	Person-months committed to PMU functions	Indicative Cost for PMU Support
Climate Change and Disaster Risk Adviser (international)	20	2	\$40,000
Environmental specialist (national)	40	40	\$80,000
Social Safeguards Specialist (national)	40	40	\$80,000
Contingency (10%)			\$20,000
Total Budget			\$220,000

86. In addition, the government will provide assistance in environmental screening through DEC's EIA unit. However, all positions as above will be funded by the project grant and are to be included in the project costing.

D. Local Capacity for Environmental Assessment

87. The capacity of DEC to review environmental impact assessments, make appropriate recommendations, and monitor and enforce permit conditions is inadequate.¹⁸ It also lacks resources to effectively and efficiently carry out its tasks as mandated under the Environment Act. To address this lack of capacity and resources, DEC has put the onus on the permitted industries to be self-regulating. The permit holder submits its monitoring reports every quarter and an annual report on its permitted operations to DEC. The reports enable DEC to review the permit holder's environmental management performance to ensure environmental quality standards are maintained. If there are problems, appropriate mitigation measures are applied immediately or as soon as practicable to protect the environment. Part VI of the Act sets out the process for environmental management and Part IX of the Act provides for enforcement of the Environment Act.

88. To meet the environmental safeguard requirements of the project, a local environmental management specialist is to be retained to support the work of the program management unit (PMU) in implementing environmental assessment and management aspects. Annex 3 provides terms of reference (TOR) for the local environmental management specialist to be recruited for project implementation assistance. The TOR covers how the consultant will work with other PMU members to provide environmental capacity building for OCCD (and tangentially DEC and other implementing agencies as appropriate). The consultant will also be tasked with developing guidelines and developing/implementing training programs for the integration of climate change considerations into the EIA process, based on the guidelines developed by the South Pacific Regional Environment Program (SPREP) in collaboration with the Caribbean Community Climate Change Centre.¹⁹

¹⁸ This was initially identified during ADB RETA 7566-REG Strengthening and Use of Country Safeguard Systems PNG Environment Subproject which included diagnostic and institutional capacity assessment of DEC (2013). More recently, the lack of skilled DEC staff to undertake the EIA process recently came to the fore when it received the EIS from the developers of the PNG LNG Project. Due to the lack of capacity, the assessment of this major development project was sourced out to international consultants to undertake.

¹⁹ *Guide to the Integration of Climate Change Adaptation into the Environmental Impact Assessment Process.* – World Bank/Global Environment Facility/Canadian International Development Agency, SPREP/CCCCC. See – <http://200.32.211.67/M-Files/openfile.aspx?objtype=0&docid=2358>

6. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

89. **Consultation and participation.** Meaningful public consultation is required throughout the project cycle to ensure that potential environmental and social impacts are fully disclosed and mitigation measures are appropriate. The following are the key principles to be followed for consultation processes:

- (i) Adequate and relevant information is disclosed in a timely manner;
- (ii) Information is readily accessible and understandable to affected people;
- (iii) Consultation is undertaken in a non-threatening atmosphere, ensuring that all dialogue is free from intimidation or coercion;
- (iv) Processes are gender-inclusive and responsive, tailored to meet the needs of disadvantaged and vulnerable groups; and
- (v) Consultation is meaningful, with all relevant views of stakeholders and affected people taken into account for decision-making in areas such as project design, environmental mitigation measures, sharing of development benefits and opportunities, and implementation issues.

90. During project design, there was extensive consultation with relevant stakeholders. Site visits were conducted to two of the vulnerable islands. A thorough consultation process was implemented through household surveys, public meetings, follow-up issue-based workshops, focus group discussions, community meetings, together with detailed interviews with town and district officers, community and church groups, government agencies, private sector representatives and other relevant stakeholders. Information disclosure was integrated into poverty and socio-economic surveys that were conducted, and within the community vulnerability mapping and assessments. Participants in the household and gender surveys were given a brief overview of the Project and comments elicited on potential risks and impacts. Stakeholders were encouraged to identify priority project needs and interventions that would address identified risks.

91. Respondents were provided with contact details for any follow-up questions. This ensured that the basic project concepts were made widely known in the sites that were visited. In meetings with stakeholders and with the general public, all issues relating to environmental aspects were disclosed as part of the presentations. No concerns were expressed during the discussions about environmental issues related to possible subcomponent interventions. There was endorsement of the need for climate proofing at the household and community levels, and no concerns were expressed in relation to any proposed project interventions. This level of engagement, beyond simple information provision, recognizes all partners in the development process and provides input into a robust project design and IEE. This process of engagement will be the format used during project implementation on the understanding that up-front dialogue from an early stage will often prevent unnecessary and costly project delays during implementation. A summary of the consultations conducted to-date is provided in Annex 8.

92. In order to continue a meaningful consultative process, ongoing dialogue will be undertaken during the implementation phase. Such consultation during community vulnerability mapping, the identification of appropriate project interventions to address priority risks, and subsequent construction and implementation provides for greater accountability, strengthening the relationship between implementers and beneficiaries, and enhancing results achieved. Efforts to strengthen communication with women and any socially-disadvantaged groups will be

undertaken so that consultation processes empower all people to contribute and do not inadvertently exclude any group.

93. **Disclosure.** ADB's Public Communications Policy 2011 requires disclosure unless there is a compelling reason for non-disclosure. In addition, a mechanism is provided to handle responses and complaints. One of the essential mechanisms required by ADB for disclosure concerning projects and programs is the use of the Project Data Sheet (PDS). A PDS is prepared for each project supported by ADB, and placed on the ADB website. ADB updates the PDS on a regular and frequent basis to reflect the project's status, and to report whenever necessary on project developments, activities and issues.

94. In addition to ADB requirements for disclosure as described above, statutory reporting requirements according to the laws of the Government of Papua New Guinea also apply. One of the key general requirements, under the Environment Act 2000, is for any person or entity intending to conduct a Level 2 or Level 3 activity, to report such intention at least one month prior to commencing any preparatory work for that activity. Other reporting requirements may apply for a range of specific actions or occurrences, under a variety of other related laws and regulations, to ensure that potential impacts are adequately anticipated, avoided, minimized and mitigated (e.g., Public Health Drinking Water Regulation, Oil and Gas Act, Plant Disease and Control Act, Prevention of Pollution of Sea Act, National Cultural Property Preservation Act, etc.).

95. For project monitoring, documentation of all public consultation and information disclosure activities is important, and will provide a transparent overview of dialogue within the context of environmental and social safeguards. Records of meetings need to include an overview of invitees, attendance, and details of how information has been disclosed. Pertinent issues raised in all public fora should be recorded. Annex 9 provides a template for recording the information to be documented, and an example of the type of meeting minutes that may be taken. Consultation summaries are to be provided as annexes to the IEEs.

7. GRIEVANCE REDRESS MECHANISM

96. **General principles.** ADB requires that a GRM be established and maintained. It should be designed to efficiently receive and facilitate the resolution of affected persons' (AP) concerns and grievances about project-level social and environmental issues within a reasonable timeframe. The GRM should be scaled to the risks and impacts of the project. It will address AP's concerns and complaints promptly, using an understandable and transparent process that is gender-responsive, culturally appropriate, and readily accessible to all segments of the community. The GRM may be revised once the project commences to ensure that its provisions remain relevant and practical. It should also be updated as required during the implementation process, to optimize the redress process.

97. During project implementation, it is possible that people may have concerns about the project's environmental performance. People may perceive negative impacts during the construction or operational phase, and they have the right to have their complaints fairly heard and acted on. Many issues can be resolved effectively through timely communication, inquiry, and mitigation measures.

98. Information about the GRM process will be widely disseminated to all APs during project consultations. It will be contained in the public information brochure to be distributed to each affected household/community during the initial household climate change risk survey. The GRM is in place for all safeguard issues, providing a streamlined process for any concerns or issues in relation to social safeguards and environmental impacts. A detailed GRM specific for

sub-component 3.2 (climate resilient infrastructure) activities are set out in detail in the IEE accompanying that sub-component.

99. **Coordination.** A grievance focal point (GFP) will be established by the district/village Officer and /or Ward Councilor to coordinate and address all complaints and concerns arising from the project. The contact details will be provided to all affected persons.

100. The GFP will be assisted and supported by the PMU ESU who will maintain a register of complaints, keep track of their status, and report to the PSC. They will regularly track complaints received, actions taken and the status of resolution. All communications with the affected person(s), and management actions taken to avoid community concerns in the future, will be documented. Complaint forms will be distributed to the GFP to facilitate recording of complaints.

101. **Grievance procedures.** Affected persons will be informed that they should ask any questions or discuss grievances with their community leader or the district/town GFP by phone or in person; or with project staff visiting the area. The GFP is encouraged to discuss any issued with the contractor or ESU. Minor environmental impacts can often be remedied with immediate action. If questions/grievances are not addressed within 1 week, they should be prepared in writing (using the assistance of the local community leader, church, or school if necessary). The complainant will also be informed that national and international project staff could assist them with writing a grievance letter if necessary.

102. Written complaints can be sent or delivered to the PMU/ESU, where they will be registered as being received, and will be treated confidentially. The PMU/ESU will have 1 week to deliver a resolution to the complainant. In the event that a satisfactory answer cannot be provided, the affected person may lodge the complaint with the OCCD and receive a reply within 7 days.

103. In the event that the situation is not resolvable, or the complainant does not accept the decision, the affected person(s) may have recourse to the district court (or other relevant court). All court costs (preparation and representation) will be paid for by the project, regardless of the outcome. Table 6 outlines a summary of the grievance resolution process.

Table 6 - Grievance Resolution Process

Stages in Response Handling	Required Activities
Village head or district/town GFP	<ul style="list-style-type: none"> - Registers the written complaint and attempts to resolve it with the affected person within 1 week. - Verbally responds to questions and or complaints. May represent affected person in direct discussions with contractor or safeguards team. - If no response within week, or response is unsatisfactory, affected person prepares a grievance in writing (utilize standard forms where possible).
PMU	<ul style="list-style-type: none"> - Registers the written complaint and attempts to resolve it with the affected person within 1 week. - If a solution is not reached, the PMU refers it to OCCD
OCCD	<ul style="list-style-type: none"> - Consults with relevant ministries, the GFP, and PMU in the resolution of complaint. - Makes a decision within 1 week. - If the decision is still unacceptable to the complainant, s/he may take it before the District (or other relevant) Court, with all costs paid for by the project.
District (or other) Court	The court hears the case and makes a final decision that is binding on all parties.

104. In the post project period, there remains the potential for environmental harm to occur through the operation of the subcomponent system. In such cases, the GRM would revert to

existing systems of environmental protection. Persons or groups can seek resolution of a grievance in relation to environmental harm through directly triggering the environmental complaint and investigation mechanism existing within DEC.

8. MONITORING ENVIRONMENTAL PERFORMANCE AND REPORTING

105. The EMP for each subcomponent will define how mitigation measures prescribed in the IEE are to be monitored during the design, construction, and operational phases. EMPs must be completed for the subcomponents and approved before any awarding of civil works. They will then be used as general templates to be matched and/or exceeded in detail for remaining candidate subcomponent interventions. Monitoring procedures for sub-component 3.2 (climate resilient infrastructure) activities are set out in detail in the IEE accompanying that sub-component.

106. Monitoring procedures will include documentation of who is responsible for each monitoring action, and the timeframe and schedule for monitoring activities. Each of the three project stages of preconstruction, construction, and operation requires monitoring to be designed and implemented. Examples of monitoring requirements are provided in the EMP template in Annex 5.

107. Good monitoring practice requires a monitoring report to be completed according to the following schedule:

- (i) a report at the end of project design (prepared by the PMU);
- (ii) a monthly report prepared by the contractor during any construction;
- (iii) a report prepared every 3 months by the PMU for ADB,
- (iv) semi-annual safeguards monitoring reports, and
- (v) an annual report that is prepared by the operating agency during operation for as long as the monitoring is specified in the EMP.

108. The design of the individual monitoring program within each EMP needs to be commensurate with the level of environmental impact predicted, and the complexity of mitigation measures. Depending on the specific requirements, monitoring may include regular periodic site visits, and may require soil, water, or air sampling and analysis; biological, geological or hydrological surveys; health and safety surveys; and similar mechanisms.

ANNEXES

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ANNEX 1: CLIMATE CHANGE VULNERABILITY ON PNG SMALL ISLANDS AND ATOLLS

1. PNG occupies approximately half the area of the island of New Guinea (shared with Indonesia to the west) and also includes four large islands (Manus, New Ireland, New Britain, and Bougainville) as well as some 600 small islands lying between the Coral Sea and the South Pacific Ocean. The total land area is 465,000 square kilometers (km²). It has an exclusive economic zone of 2.4 million km², which encompasses 17,000 kilometers of coastline and almost 2,000 coastal villages, with a rural population of nearly 500,000 people. Communities in PNG have developed more than 800 languages as well as unique customs and traditions, in part due to the isolation that results from the country's rugged terrain.
2. The natural environment throughout PNG is extremely fragile and highly vulnerable to both natural and human impacts. During the last 50 years or so, increasing pressures on the resources are intensifying the country's vulnerability due to extreme events such as natural hazards, including cyclones, droughts, earthquakes and tsunamis. In addition to these threats and pressures to the environment, expected changes that may arise from climate change and climate variability will likely further exacerbate these impacts and deplete the resources that are most essential for basic life support systems.
3. PNG's rural coastal populations, especially those living on small, remote, and low-lying coral islands and atolls, are particularly vulnerable to sea-level rise and other weather-related manifestations of climate change. Described below are some of the key climate change-related impacts that are expected to affect communities on PNG's small, remote islands and atolls.
4. **Water.** Climate variability will affect water quantity/quality and the hydrological cycle through fluctuations in rainfall intensity and changes in evapo-transpiration. This will most acutely affect the more than 200 inhabited low-lying islands and coral atolls where communities rely on rainwater or limited groundwater lenses for supply of freshwater, both for human consumption and for gardening. Groundwater will be affected by saltwater intrusion from rising sea levels and leakage during storm surges, causing shortages of freshwater.
5. **Coral Reefs.** A large proportion of PNG's shoreline is protected by both barrier and fringing coral reefs. Coral reefs are known to be sensitive to increases in surface ocean temperatures, which cause coral bleaching and death from the loss of zooxanthellae (the symbiotic algae that sustain them). The inundation of reefs, combined with increased surface water temperatures and possible increased sedimentation and turbidity from shoreline erosion could also contribute to reef mortality. The loss of vital coastal defenses provided by barrier reefs and mangrove communities will heighten the impacts of coastal flooding. As natural breakwaters, coral reefs provide a vital wave energy dissipation function and their loss would result in increased coastal erosion. Coral reefs also serve as the nursery grounds for coastal fishery resources, and their continued decline will impact upon the productivity of the coastal fishery upon which many communities rely for their basic source of food.
6. **Coastal Inundation.** Nationwide, approximately 4,500 kilometers of the total 17,100 kilometers of shoreline are expected to be moderately to severely inundated with increasing climate change, affecting up to 30% of PNG's population. In addition, there is a danger that some very low-lying islands, including barrier islands, will be completely submerged. There is evidence that this is already occurring in the outlying atoll islands of Mortlock, Tasman, and the Duke of York islands.

7. **Fisheries.** In addition, climate change will have a significant impact on coastal fisheries, which are already stressed through overexploitation and environmental degradation. Many nursery-grounds for commercially important fish and shellfish are located in shallow waters near the coast that will be impacted by sea-level rise and increased incidence of storms and coastal flooding. Changes in ocean temperatures and ocean acidification will affect the range and migration patterns of offshore fish stocks.

8. **Health.** Direct health effects from climate change are expected to include increases in the incidence of vector-borne and water-borne diseases, such as malaria, cholera, and diarrhea. Only 20% of rural inhabitants have access to safe drinking water and sanitation services, further contributing to the incidence of water-borne diseases, and making PNG most vulnerable to cholera outbreaks. Increases in the incidence of ciguatera fish poisoning are also possible, due to increasing sea surface temperatures and reef disturbances—this could cause people to modify their diet or decrease their protein intake, with resultant impacts on health. Within rural villages, women, children, and the elderly are more susceptible to health risks than the male population.

9. **Food Security.** Agricultural production will be affected by climate change and climate variability, with crop yields influenced by inter-annual variations in weather and temperature. It is expected that changing climate will also bring about changes in soil moisture, soil temperature, and soil organic matter content. Increased climate variability will influence the incidence and range of pests/diseases and invasive species, which will adversely affect agricultural production and increase costs. Increases in temperature will result in rapid post-harvest deterioration of crops, while increased incidence of flooding will result in crop losses in inundated lands. Increased carbon dioxide will enhance weed growth, which could adversely affect yields. With 85% of PNG's population reliant on subsistence agriculture, these climate change effects present a significant threat to food security, livelihoods, and the well-being of the population.

10. **Social Impacts.** There is a strong inverse correlation between the level of socioeconomic development of the coastal provinces of PNG, and the extent to which they will be affected by climate change. Provinces expected to be most affected by sea level rise include Western, Gulf, West and East Sepik, Manus, New Ireland, Bougainville, and Milne Bay. Coastal villages in these provinces, being among the least developed communities in PNG, will likely to suffer the greatest losses and socioeconomic disruptions due to impacts from climate change.

ANNEX 2: MAPS AND PROFILES OF SELECTED ISLANDS/SITES

1. Within the five target Provinces identified in the approved PNG SPCR (Bougainville, East New Britain, Manus, Milne Bay, and Morobe) vulnerable communities have been identified on nearly 200 islands. In general, these sites share the following characteristics:

- (i) Small, low-lying coral islands or atolls (usually not exceeding approximately 5m in elevation);
- (ii) Communities of small population size (generally a few hundred households or less), but high population density;
- (iii) Remote islands and atolls that are difficult to access from main population centers;
- (iv) Limited areas of good soil for food production.

2. Many of the selected islands lack any groundwater, and even where groundwater resources are present, they are often compromised by saltwater intrusion or by percolation of nutrients, bacteria and other contaminants. Topsoil on such islands is typically nutrient-poor, comprised of a thin layer derived from leaf litter, and agricultural activities are thus limited. Low elevations make these sites particularly susceptible, in the short term, to inundation by waves and storm surges during extreme weather events, or extreme high tides (“king tides”), and, over the long term, to sea level rise. In some sites, coral reefs that would otherwise provide some protection against storms and waves have been damaged due to coral harvesting and other damaging practices. Finally, the remoteness of these areas means that it is difficult for the local communities to access essential goods and services, and to transport any products (mainly fish, lime, and copra) to market. Thus, access to health, education, and other social services, as well as livelihood opportunities, are extremely limited.

3. In summary, because of these characteristics, these islands and atolls have been termed “Islands in Peril” and are among the most vulnerable to climate change effects to be found anywhere in PNG.

4. Due to limited budget and the pilot nature of the project, it is not possible to implement project activities in all these inhabited islands. Therefore, during the PPTA, potential sites for piloting activities to promote climate change resiliency were identified based on a multi-criteria ranking and selection process, and the resulting short list of prospective sites is presented in Table 1. Population figures in Table 1 are from the 2011 census. The locations of the main sites proposed for the Project are shown (by Province) in Figures 1 through 5.

Table A2.1 - Project Priority Islands and Atolls

Province	District	Island Group	Island	Villages	Population (2011)
Manus	Manus				
			Ahus		606
			Andra		486
			Ponam		534
		Bipi Island		Maso	352
				Matahai	232
				Salapai	484
				Sisi/Paii	55
East New Britain	Kokopo				
		Duke of York	Kerawara		530
			Utuan		609
			Mioko	Palpal	949
				Virian	677
			Mualim		383
Milne Bay					
	Samarai Murua		Kwaraiwa		162
			Ware		1250
			Budibudi		232
			Wiakau	Yanaba	312
				Egom	135
	Kiriwina-Good-enough	Trobriand Islands	Kiriwina		30195
			Kitava		3659
			Manuwata	Manuwata	250
			Kaileuna		2787
Morobe	Tewai-Siassi				
			Malai		499
			Aramot	Aromot 1-7	945
			Mandok		715
			Tami Island	Wanam	143
				Kalal	182
Bougainville	Atolls				
		Carterets	Han		413
			Piul		220
			Yangain		152
			Yolasa		102
			Yesila		116
		Mortlock	Nukutoa		302
		Tasman	Nukumanu	Amotu	453
		Fead	Busuria		279
			Sauma		113
			Hunamohu		15
	North Bougainville			Tearuki Mission	294
Total Population					49822

Figure A2.1 - Map of Priority Project Sites in Manus

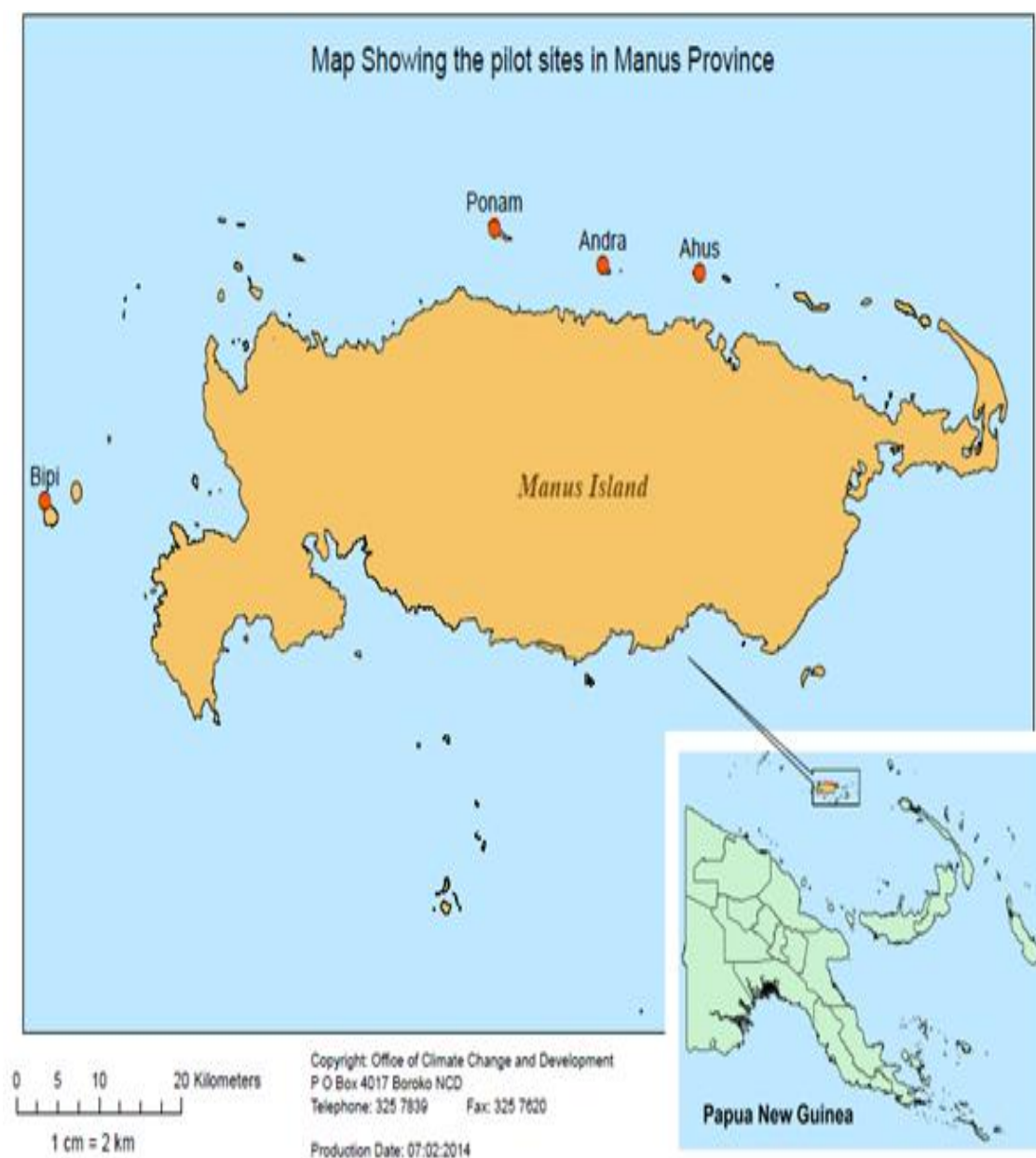


Figure A2.2 - Map of Priority Project Sites in East New Britain Province

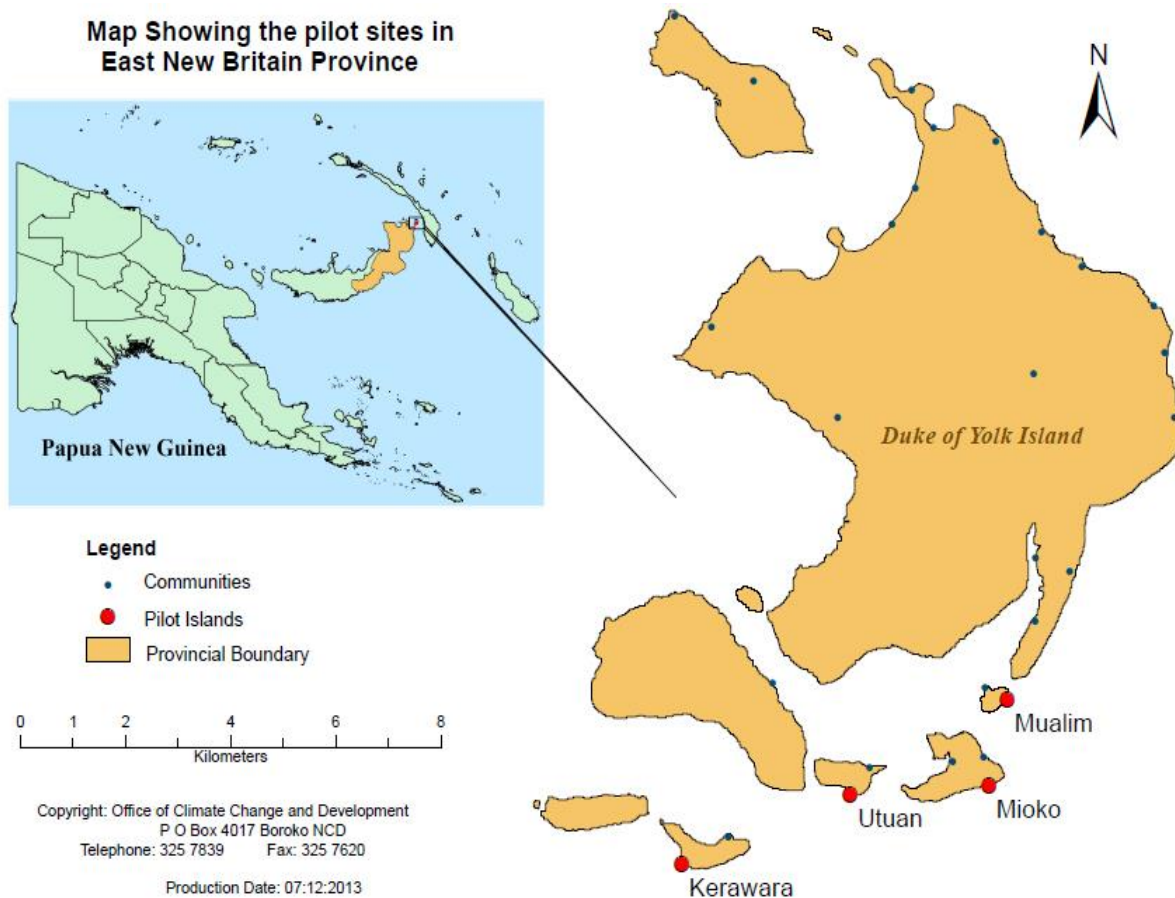


Figure A2.3 - Map of Priority Project Sites in Bougainville Province

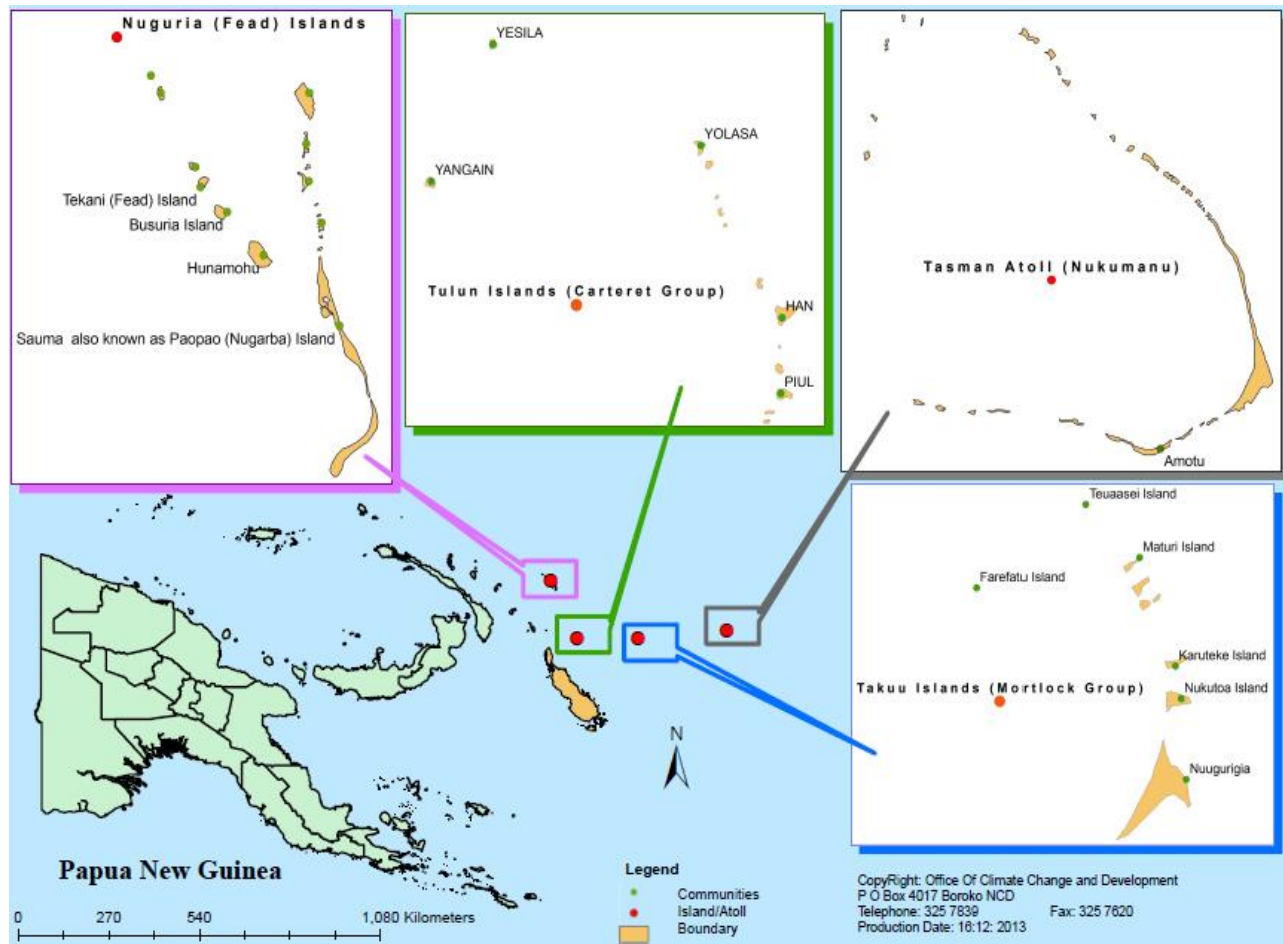


Figure A2.4 - Map of Priority Project Sites in Morobe Province

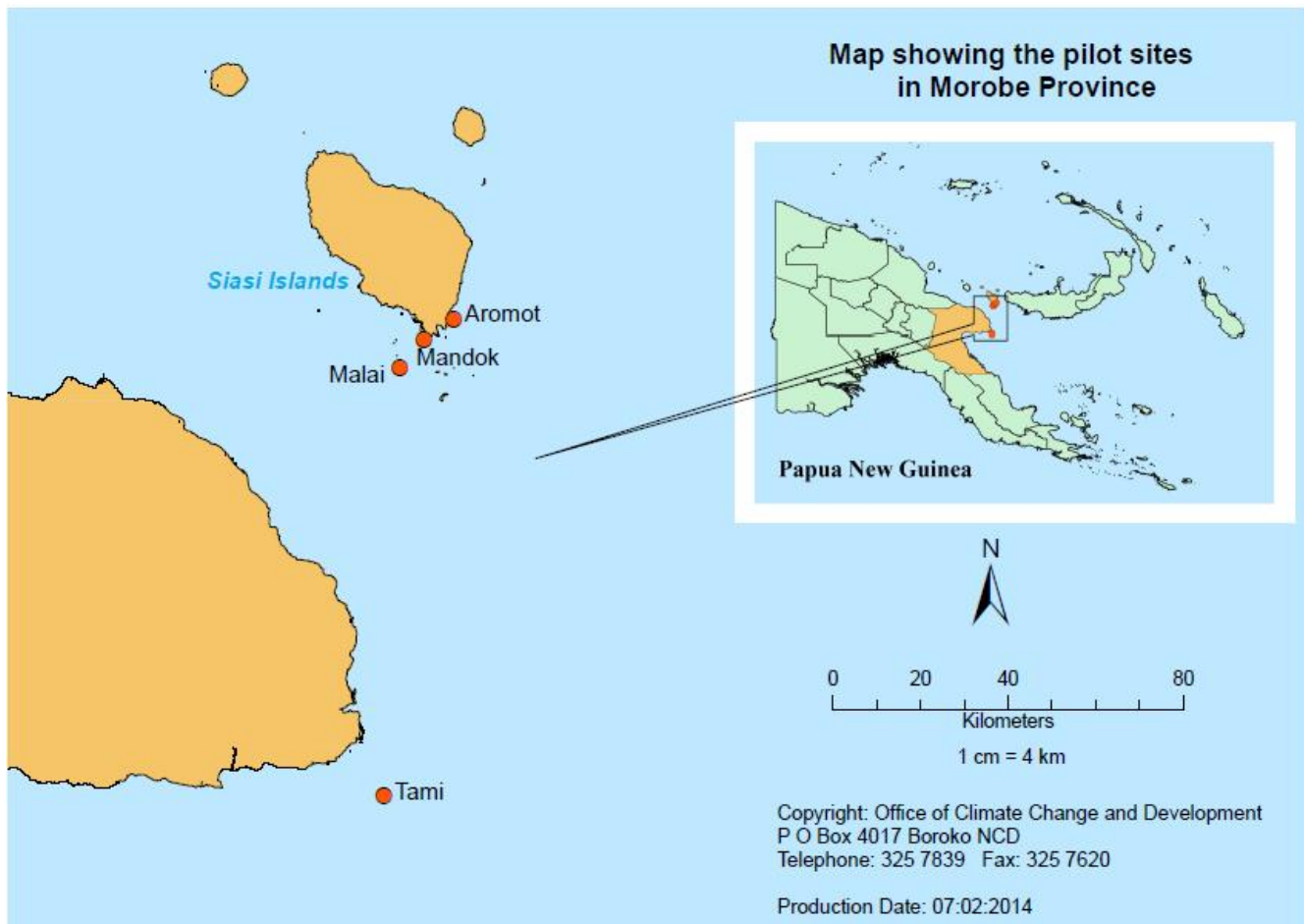
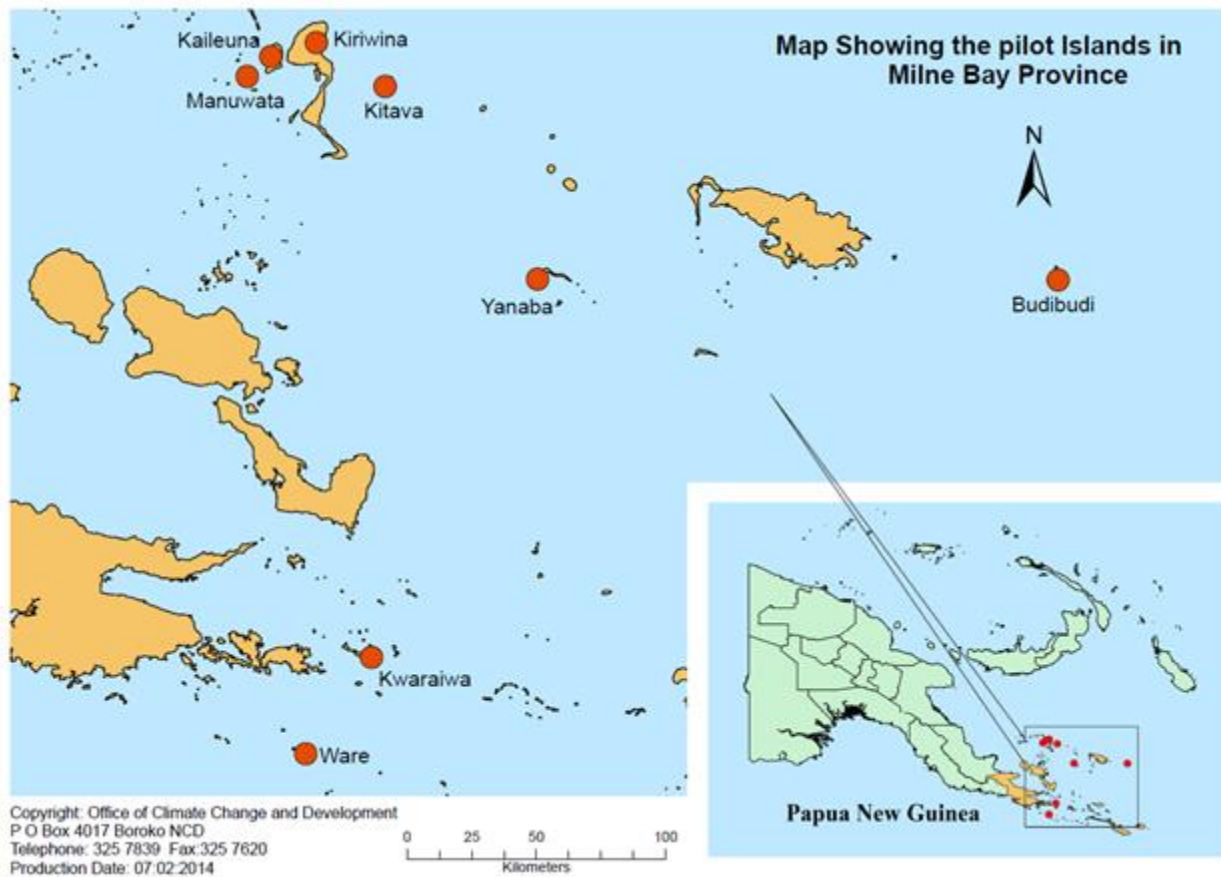


Figure A2.5 - Map of Priority Project Sites in Milne Bay Province



ANNEX 3: SUBPROJECT SELECTION CRITERIA

1. Specifically, under this grant facility, no category A subcomponents will be funded, that is, subcomponent interventions that are likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. This includes trans-boundary or cumulative impacts.
2. Under Components 1 and 2, all subcomponent interventions under the Project will be specifically restricted to include only those activities that either:
 - a. Involve no construction of infrastructure, or physical alterations to the environment; or
 - b. if physical works are required, these will be of small scale with minor impacts that will be easily mitigated, or with no impacts.
3. However, because a subcomponent of Output 3 is site specific and involves physical works of a larger scale, the potential environmental impacts have been classified as a Category B activity, and therefore an Initial Environmental Examination (IEE) will be completed. The IEE will include a comprehensive EMP.
4. In order to receive project funding, a subproject must meet the following screening criteria:

Technical Criteria

- (i) The proposed subproject must address mitigating measures to one of the priority investment activities agreed by the community following the vulnerability assessment; and
- (ii) The technical feasibility of the proposed subproject shall have been evaluated by the appropriate technical agency and the results presented at a community meeting convened with no less than 50% of the population normally inhabiting the community at which the proposed subproject shall be agreed to by a simple majority of people attending the meeting.

Environmental Criteria

- (i) Only subprojects that have a minor environmental impact (based on ADB Category B or C for the environment) will be eligible for financing under the Project. The financing will only be provided if site specific mitigating measures are adopted during the construction and operational stages of the subproject.
- (ii) A water quality assessment shall have been undertaken of all wells used by the community, the results of which identify the risk associated with the proposed subproject;
- (iii) A soil assessment shall have been undertaken of all land used by the community, the results of which identify the risk associated with the subproject;

- (iv) A coral and marine ecosystem assessment shall have been undertaken of all coastal coral and marine resources used by the community, the results of which identify the risk associated with the proposed subproject; and
- (v) No proposed subproject shall be undertaken if it involves:
 - a) the use of any toxic or harmful substances;
 - b) the removal of trees (including mangroves) or natural vegetation of any area in excess on half an acre;
 - c) construction of any building, road, wharf, barrage, embankment, or levee that will affect the flow of tidal waters;
 - d) the removal of sand exceeding 10 cubic meters;
 - e) the use of any plant or animal species that is not compatible with local ecological conditions (e.g., native species or ones already present); and
 - f) the release of waste material (e.g. from processing) into the coastal environs.

Resettlement and Social Criteria

- (i) No proposed subproject shall be undertaken if it involves:
 - a) any acquisition of land;
 - b) forced relocation of any person; and
 - c) any activity that results in a negative impact on women, children, or any disadvantaged member of society;
- (ii) Where the subproject raises resettlement issues, the claims of affected persons must be satisfied and paid in full prior to the commencement of any works.

Processing Criteria

- (i) No less than 50% of the population normally inhabiting the community confirm their support for the proposed subproject;
- (ii) A community meeting shall have been convened involving no less than 50% of the population normally inhabiting the community during which the risk associated with the proposed subproject and the nature of the proposed intervention shall have been identified as a priority; and
- (iii) Local level governments, district and provincial administrations must confirm the investment is consistent with local socio-economic development objectives.

ANNEX 4: OUTLINE TABLE OF CONTENTS FOR IEE

The following outline is adapted from the Annex of Appendix 1 of ADB's Safeguard Policy Statement (2009). This outline is part of the Safeguard Requirements. An environmental assessment report is required for all environment Category A and B subprojects or activity. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, while an IEE may have a narrower scope depending on the nature of the Project. In general an "alternatives analysis" is not required for IEEs, so this element has been excluded from the outline provided here. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.

A. Executive Summary

This section describes concisely the critical facts, significant findings, and recommended actions.

B. Policy, Legal, and Administrative Framework

This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

C. Description of the Project

This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project layout and components, the project site, and the project area of influence.

D. Description of the Environment (Baseline Data)

This section describes relevant physical, biological, and socio-economic conditions within the study area. It also looks at current and proposed development activities within the project area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

E. Anticipated Environmental Impacts and Mitigation Measures

This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media [SPS Appendix 2, para. 6]), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further

attention; and examines global, trans-boundary, and cumulative impacts as appropriate.

F. Information Disclosure, Consultation, and Participation

This section: (i) describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders; (ii) summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and (iii) describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

G. Grievance Redress Mechanism

This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

H. Environmental Management Plan

This section deals with the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

- (i) **Mitigation:** (a) identifies and summarizes anticipated significant adverse environmental impacts and risks; (b) describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and (c) provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the Project.
- (ii) **Monitoring:** (a) describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and (b) describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.
- (iii) **Implementation arrangements:** (a) specifies the implementation schedule showing phasing and coordination with overall project implementation; (b) describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and (c) estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan.

- (iv) **Performance indicators:** describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

I. Conclusion and Recommendation

This section provides the conclusions drawn from the assessment and provides recommendations.

Annexes

References

ANNEX 5: TEMPLATE FOR ENVIRONMENTAL MANAGEMENT PLANS FOR SUBPROJECTS

Project components/ interventions (subproject)	Possible Impacts	Mitigation Measures	Responsible Parties	Cost and Source of Funds	Monitoring Mechanism	Reporting
Improved land management-e.g., raised bed gardens, soil conservation on slopes and hills	No adverse impacts are anticipated	None required	PMU (environmental management specialist) in consultation with local agronomists	Included in specialist's remuneration	Field visits, site inspections	Include in project quarterly reports and subcomponent reports
Improved agricultural methods-composting, IPM, control of pests and invasive species	Potential for inadvertent introduction of invasive species and alterations to natural gene pool	<ul style="list-style-type: none"> • <u>Design phase</u>: Identify appropriate IPM methods and biological control species to be used • <u>Operation Phase</u>: monitor bio-control species 	PMU (environmental management specialist) in consultation with local agronomists	Included in specialist's remuneration	Seed procurement lists, on-site verification Subcomponent reports	Include in project quarterly reports and subcomponent reports
Drought- and salt-tolerant crops	Potential biosafety risks/impacts need to be assessed	<ul style="list-style-type: none"> • <u>Design phase</u>: Identify appropriate crop species that are compatible with local ecological conditions (e.g., native species or ones already present) • <u>Operation Phase</u>: monitor crops to ensure that no alterations in natural gene pool are occurring 	PMU (environmental management specialist) in consultation with local agronomists	Included in specialist's remuneration	Seed procurement lists, on-site verification Subcomponent reports	Include in project quarterly reports and subcomponent reports
Improved income generation—seaweed culture	Project sites need to be evaluated for suitability of this activity	<ul style="list-style-type: none"> • <u>Design Phase</u>: care in site selection; selection of appropriate species for culturing • <u>Operation Phase</u>: carry out environmental monitoring to ensure that seaweeds are not encroaching on natural habitats 	Independent marine biological / mari-culture contractor; PMU (environmental management specialist)	Est. ~\$2,000-\$5,000 per site for designing, and training communities on, appropriate culturing procedures that include env. safeguards	Marine biological surveys Subcomponent reports	Include in project quarterly reports and subcomponent reports
Improved transport of fresh food products	Influx of people to remote islands/atolls in excess of carrying capacity; increased pollution to marine waters; introduction of invasive	<ul style="list-style-type: none"> • <u>Design Phase</u>: determine appropriate scheduling and capacity of vessels • <u>Operation Phase</u>: ensure regular cleaning and 	Marine transport contractor; PMU (environmental management specialist)	Costs included in cost of transport contract (borne by contractor); estimate	Demand survey Water quality analyses	IEE/EMP prepared for subcomponent Quarterly and annual transport

Project components/ interventions (subproject)	Possible Impacts	Mitigation Measures	Responsible Parties	Cost and Source of Funds	Monitoring Mechanism	Reporting
	marine or terrestrial species	maintenance of vessel hulls to remove sessile algae and invertebrates; discharge bilge water appropriately; inspect vessels and utilize pest control for minimizing risks of introducing invasive species appropriately	DEC and/or Maritime Bureau environmental monitoring specialists to supervise vessel inspections	environmental management and monitoring costs at approximately 5-10% of total subcomponent cost	Vessel inspections	contractor reports; DEC/or Maritime Bureau inspection reports
Improved communications	Hazards associated with VHF radio waves pose a possible threat	<ul style="list-style-type: none"> • <u>Design Phase</u>: assess any potential risks of exposure to VHF radio waves and design and mitigate accordingly • <u>Installation Phase</u>: install facilities so exposure to radio waves are properly managed • <u>Operation Phase</u>: operate facilities so exposure to radio waves are properly managed 	Installation development contractor, in close cooperation with PMU (environmental management specialist)	Costs included in cost of installation contract (borne by contractor); estimate environmental management and monitoring costs at approximately 5-10% of total subcomponent cost	Installation reports Site inspections Site-specific analysis of VHF radio wave hazards	Installation contractor reports; DEC site inspection reports
Food preservation and processing (e.g., smoking and drying of fish)	Construction of food processing facilities could cause increases in noise, dust, and water runoff during construction; potential for pollution during operation, and food safety hazards without proper controls in place	<ul style="list-style-type: none"> • <u>Design Phase</u>: ensure sites for new construction are selected to minimize impacts on the site due to any necessary vegetation clearing, excavation works etc. • <u>Construction Phase</u>: apply best engineering practices to minimize dust, noise, pollution and runoff • <u>Operation Phase</u>: operate facilities so that any hazardous wastes, solid wastes, are properly managed; ensure sanitary standards required for 	Construction development contractor, in close cooperation with PMU (environmental management specialist) DEC	Costs included in cost of construction contract (borne by contractor); estimate environmental management and monitoring costs at approximately 5-10% of total subcomponent cost	Construction reports Site inspections Quantitative measurements for noise, dust	IEE/EMP prepared for subcomponent Contractor construction reports; DEC site inspection reports

Project components/ interventions (subproject)	Possible Impacts	Mitigation Measures	Responsible Parties	Cost and Source of Funds	Monitoring Mechanism	Reporting
		food industry (e.g., hazard analysis and critical control points [HACCP]) are maintained				
Installation of 5000-liter tanks with iron roofing, guttering, taps	Household demand (especially during dry season) should be assessed prior to installation, to ensure proper sizing of tanks	<ul style="list-style-type: none"> • <u>Design Phase</u>: assess water demand to design collection/storage capacity accordingly; provide for adequate maintenance capacity • <u>Construction Phase</u>: apply best engineering practices to minimize disruption of normal community activities, reduce noise and dust • <u>Operation Phase</u>: maintain equipment properly to safeguard the investment 	Community members, in close cooperation with PMU (environmental management specialist)	Community to provide in-kind contribution to complement project funding	Household Water demand study construction reports Site inspections	IEE/EMP prepared for subcomponent if needed
Improved wells	Improper site selection could cause problems in maintaining groundwater quality, due to saline intrusion and/or contamination by pollutants	<ul style="list-style-type: none"> • <u>Design Phase</u>: assess water demand and the nature and capacity of the groundwater resources, to determine whether aquifer is of adequate size to support the demand • <u>Construction Phase</u>: apply best engineering practices to minimize introduction of pollutants into groundwater • <u>Operation Phase</u>: ensure that drawdown of aquifer stays within sustainable limits, to avoid saltwater intrusion—conduct community training on proper water resource management methods 	PMU (environmental management specialist); hydrology/water quality consultant	Est. ~\$5,000 per site for water surveys; from project budget for sub-component	Site survey Water quality analysis	Site survey reports Water quality analytical reports

Project components/ interventions (subproject)	Possible Impacts	Mitigation Measures	Responsible Parties	Cost and Source of Funds	Monitoring Mechanism	Reporting
VIP (ventilated improved pit) toilets, composting toilets	Potential to increase the spread of vector- and water-borne diseases	<ul style="list-style-type: none"> • <u>Design Phase</u>: design should consider proper siting away from drinking water sources; appropriate technologies (VIP toilets, composting toilets) should be utilized to facilitate ease of maintenance and minimize exposure to pathogens • <u>Construction Phase</u>: apply best engineering practices to minimize introduction of pollutants into groundwater – follow CLTS principles • <u>Operation Phase</u>: maintain facilities regularly as required; dispose of degraded wastes (e.g., sludge, compost) appropriately; regularly test quality of drinking water to ensure sources not contaminated by sewage and human waste 	PMU (environmental management specialist); community health and sanitation contractor (possibly NGO); in cooperation with DEC and National Department of Health	Included in specialist's remuneration; project subcomponent funds allocated for NGO contract services— environmental costs included as part of service contract; estimate environmental management and monitoring costs at approximately 5-10% of total subcomponent cost	Site surveys	Site survey reports
Relocation of toilets away from water sources					Project subcomponent progress reports	
Water quality testing					Water quality analytical results	Water quality analytical reports
Protection of water catchment and supply						
					Site surveys	Site survey reports
					Project subcomponent progress reports	Water quality analytical reports
					Water quality analytical results	
Culverts for drainage improvement	Installation of culverts could cause increases in dust, sediments, and water runoff during construction	<ul style="list-style-type: none"> • <u>Design Phase</u>: ensure that culverts are properly designed and sited to effectively drain water-logged areas • <u>Construction Phase</u>: apply best engineering practices to minimize sediments and runoff • <u>Operation Phase</u>: conduct regular inspection and maintenance as required 	Drainage contractor; PMU (environmental management specialist); in cooperation with Public Works personnel at local level	Part of service contract; estimate environmental management and monitoring costs at approximately 5-10% of total subcomponent cost	Site surveys	Site survey reports
					Project subcomponent progress reports	Water quality analytical reports
					Water quality analytical results	

Project components/ interventions (subproject)	Possible Impacts	Mitigation Measures	Responsible Parties	Cost and Source of Funds	Monitoring Mechanism	Reporting
Vector control (mosquito nets)	No adverse impacts are anticipated	None required	PMU (environmental management specialist); in cooperation with National Department of Health personnel, NGOs	None required	Household census	Dept. Health statistical reports
Mangrove planting and management	Poor survival of planted mangroves due to unsuitable environment (especially salinity regime and substrate); introduction of invasive species	<ul style="list-style-type: none"> • <u>Design Phase</u>: sites for planting should be chosen based on their suitability to support mangroves, i.e., estuarine environments where mixing of salt and fresh water occurs; native mangrove varieties should be used to avoid introduction of invasive species 	PMU (environmental management specialist); fisheries/forest departments	Community in-kind, in cooperation with relevant agencies	Site inspections, regular monitoring	Subcomponent progress reports, monitoring reports
Fish farming, mariculture	Potential for inadvertent introduction of invasive species, and alterations to natural gene pool; unsustainable harvest of fish fry for grow-out; unsustainable harvest of trash fish/by-catch for use as feed; increases in nutrient levels due to over-feeding; interference with navigation or inhibition of natural water flow (e.g., by crowded culture cages)	<ul style="list-style-type: none"> • <u>Design phase</u>: Identify appropriate species for culturing—should employ native species • <u>Operation Phase</u>: regular monitoring of populations of target species in the natural environment to avoid overharvesting; control use of feeds to reduce nutrient loading; coordinate with maritime authorities for proper placement of culture cages to avoid conflicts with navigation; training on proper techniques for avoiding adverse environmental impacts 	PMU (environmental management specialist); CIFA	Community in-kind, in cooperation with relevant agencies	Site inspections, regular monitoring	Subcomponent progress reports, monitoring reports

Project components/ interventions (subproject)	Possible Impacts	Mitigation Measures	Responsible Parties	Cost and Source of Funds	Monitoring Mechanism	Reporting
Deployment of FADs	Improper management of FADs can lead to over exploitation of fish stocks	<ul style="list-style-type: none"> • <u>Design Phase</u>: locate FADs within zones where their use can be managed, and where natural fish stocks can be monitored • <u>Operation Phase</u>: conduct regular monitoring of fisheries stocks to determine allowable catch levels; regulate fishing activities; train fishers regarding proper use of FADs 	PMU (environmental management specialist); CIFDA	Fishers' associations, in cooperation with relevant agencies	Site inspections, regular monitoring	Subcomponent progress reports, monitoring reports
Establishment of coral nurseries for reef rehabilitation	Damage to natural coral reefs due to improper harvesting of coral propagules or overharvesting	<ul style="list-style-type: none"> • <u>Design Phase</u>: determine appropriate locations and species for sourcing of coral propagules; place coral nurseries within areas where they can be properly monitored, managed and protected • <u>Operation Phase</u>: conduct regular monitoring of corals in source areas; train communities for appropriate methods for coral farming 	PMU (environmental management specialist) In cooperation with CIFA	In-kind from community to complement support from CIFA as part of regular budgeted activities	Underwater surveys	Quarterly monitoring reports
Post-harvest fish processing and handling	Construction of fish processing facilities could cause increases in noise, dust, and water runoff during construction; potential for pollution during operation, and food safety hazards without proper controls in place	<ul style="list-style-type: none"> • <u>Design Phase</u>: ensure sites for new construction are selected to minimize impacts on the site due to any necessary vegetation clearing, excavation works etc. • <u>Construction Phase</u>: apply best engineering practices to minimize dust, noise, pollution and runoff • <u>Operation Phase</u>: operate 	Construction development contractor, in close cooperation with PMU (environmental management specialist) DEC	Costs included in cost of construction contract (borne by contractor); estimate environmental management and monitoring costs at approximately 5-10% of total subcomponent	Construction reports Site inspections Quantitative measurements for noise, dust	IEE/EMP prepared for subcomponent Contractor construction reports; DEC site inspection reports

Project components/ interventions (subproject)	Possible Impacts	Mitigation Measures	Responsible Parties	Cost and Source of Funds	Monitoring Mechanism	Reporting
		facilities so that any hazardous wastes, solid wastes, are properly managed; ensure sanitary standards required for food industry (e.g., hazard analysis and critical control points [HACCP]) are maintained		cost		
Disaster management plans	No adverse impacts are anticipated	None required	PMU (environmental management specialist) in coordination with OCCD	None required	None required	None required
Early warning systems	Hazards associated with VHF radio waves pose a possible threat	<ul style="list-style-type: none"> • <u>Design Phase</u>: assess any potential risks of exposure to VHF radio waves and design and mitigate accordingly • <u>Installation Phase</u>: install facilities so exposure to radio waves are properly managed • <u>Operation Phase</u>: operate facilities so exposure to radio waves are properly managed 	Installation contractor, in close cooperation with PMU (environmental management specialist)	Costs included in cost of installation contract (borne by contractor); estimate environmental management and monitoring costs at approximately 5-10% of total subcomponent cost	Installation reports Site inspections Site-specific analysis of VHF radio wave hazards	Contractor's installation reports; PMU site inspection reports
Disaster centers, emergency supplies and equipment						
VHF radios						

Project components/ interventions (subproject)	Possible Impacts	Mitigation Measures	Responsible Parties	Cost and Source of Funds	Monitoring Mechanism	Reporting
Provision of climate resilient infrastructure - Alotau Provincial wharf upgrade	Vital marine infrastructure, including ports and wharves essential for trade and access to community facilities, could become unserviceable due to sea level rise and storm surges	<ul style="list-style-type: none"> • <u>Design phase</u>: ensure that community usage patterns and the impacts of climate change are factored into designs and that resulting infrastructure is more climate resilient – refer to provisions in the EMP to be completed as part of the IEE • <u>Construction Phase</u>: apply best engineering practices to minimize dust, noise, pollution and runoff – refer to provisions in the EMP to be completed as part of the IEE • <u>Operation Phase</u>: operate facilities so that any hazardous wastes, solid wastes, spills and accidents are averted – refer to provisions in the EMP to be completed as part of the IEE 	<p>Construction development contractor, in close cooperation with PMU (environmental management specialist)</p> <p>Provincial Government</p> <p>DEC</p>	USD 5 million to be provided by CIF under a supplementary funding arrangement	Refer to provisions in the EMP to be completed as part of the IEE	Refer to provisions in the EMP to be completed as part of the IEE

ANNEX 6: INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

Project Implementation Organizations	Management Roles and Responsibilities
Executing Agency - OCCD	The OCCD will be the Executing Agency and will be responsible for overall management and coordination of the Project.
Project Management Unit (PMU)	<p>A PMU will be established within OCCD to manage the Project and be responsible for overall implementation performance. Among others, the PMU will be responsible for:</p> <ul style="list-style-type: none"> • overall management and coordination of BCRPNG; • liaison with the provincial administration offices in Bougainville, East New Britain, Manus, Milne Bay, and Morobe; • establishment and management of project advance account, submission of withdrawal applications to ADB, retention of supporting documents, and overseeing sub-accounts; • provision of guidance and coordination to the implementing agencies; • establishment and implementation of the project performance management system (PPMS); • selection of consulting services following ADB procedures, including project implementation support consultants (PISC); including NGO facilitation contracts and safeguard monitoring; • preparation of annual forecast of contract awards and disbursements; • recruitment of firm for annual audit of program accounts; • compilation of reports from the participating provinces and facilitating NGOs and preparation of program progress reports; • submission of progress reports and annual audit report and financial statements; and • preparation of the project completion report.
National Steering Committee	<p>At national level, a Steering Committee will be established to guide the overall project implementation of the Project. The Steering Committee shall be chaired by Executive Director or designated representative from the Office of Climate Change and Development and have representatives from the Department of National Planning and Monitoring (alternate chair), with committee members appointed from Department of Treasury, Department of Health, Coastal and Inland Fisheries Development Authority, National Disaster Centre, PNG Ports Corporation Ltd. and National Agricultural Research Institute. The secretariat of the steering committee shall be the PMU established within OCCD. The Steering shall meet every six months or as required to ensure timely guidance to the Project. Its main responsibilities shall include:</p> <ul style="list-style-type: none"> • ensure interagency cooperation at national level; • review and advise on policy issues and implementation constraints; • ensure integration with other donors and government related development activities; • monitor implementation progress; • approve annual work-plans and budgets; • set up a procurement committee for the project; and • provide overall guidance on implementation of the Project.
Implementing Agencies	<p>There will be four implementing agencies for the Project:</p> <ul style="list-style-type: none"> • At the national level, OCCD will be responsible for the implementation coordination of Outputs 1 and 2 initiatives. Under Output 1, OCCD will be responsible for the recruitment of facilitating NGOs in the five provinces and for coordinating the vulnerability assessment work on the 21 target vulnerable island communities. • The Coastal and Inland Fisheries Development Agency (CIFDA), and the National Agricultural Research Institute (NARI) will jointly implement the proposed initiatives under Output 2. • Output 3 will be implemented by PNG Ports Corporation Limited (PPCL) while the early warning and communications network will be implemented by OCCD with technical support from the National Disaster Center.

	<ul style="list-style-type: none"> At the provincial level, the Administrator's office in each participating province will be responsible for coordination of implementation activities in each of the first two components. As responsibilities are confined to coordination, it is not considered necessary to establish an implementation structure specifically for project implementation. <p>Upon evidence of satisfactory financial performance and reporting, it is envisaged that one imprest account will be established by OCCD to assist in project implementation with one sub-account to be established in PPCL where supporting documents will be retained. This will require a minor change in implementation arrangements upon confirmation of capacity of the EA.</p>
OCCD	<ul style="list-style-type: none"> Recruit suitably qualified NGOs to support Output 1 vulnerability assessments; Coordinate the implementation of Output 1 initiatives following the vulnerability assessments; Liaise with provincial administrations to coordinate the activities on vulnerable islands; Establish and administer the Climate Resilient Community Trust Fund (CRCTF) Review applications for subproject financing by the CRCTF; and Coordinate implementation of Output 2 initiatives including the recruitment of facilitating NGOs to support food security and fishery eco-system base-line data.
PPCL	<ul style="list-style-type: none"> Recruit consulting services to support the creation of an enabling environment for port rehabilitation and construction;
CIFDA	<ul style="list-style-type: none"> In cooperation with facilitating NGOs, conduct a detailed resource assessment of traditional fishing grounds and surrounding island reefs as a base line against which future impacts can be compared; Provide the technical expertise to local marine management associations to assist in preparing marine resource management plans in target communities; Assist in the identification of participating target communities for the fishery-ecosystem interventions; Provide the technical support for the piloting of project interventions including mangrove rehabilitation, reef rehabilitation, commercial fisheries aquiculture and mari-culture and other identified initiatives; Facilitate marine marketing and storage demonstrations in identified locations; and Participate in annual reviews of project implementation.
NARI	<ul style="list-style-type: none"> In cooperation with facilitating NGOs, conduct a detailed food security assessment of vulnerable islands as a base line against which future impacts can be compared; Provide the technical expertise to local villages to assist in undertaking food security initiatives in target communities and in adjoining land masses that actively trade with the vulnerable islands; Assist in the identification of participating target communities for the food security, marketing and processing interventions; Provide the technical support for the piloting of project interventions including crop diversification, cultivation procedures, varietal modifications, multiplication of planting material and other initiatives; Facilitate land based marketing and storage demonstrations in identified locations to extend the shelf life of food products for supply to the more food insecure locations; and Participate in annual reviews of project implementation.
ADB	<p>As the multi-lateral development agency administrator of the project, ADB will:</p> <ul style="list-style-type: none"> Administer the CIF/PPCR grant; monitor program implementation arrangements, disbursement, procurement, consultant selection, and reporting; monitor schedules of activities, including funds flow; review compliance with agreed procurement procedures; review compliance with loan covenants;

	<ul style="list-style-type: none"> • monitor effectiveness of safeguard procedures; • analyze the outcome of the capacity building and training programs; • monitor conformity with ADB anti-corruption policies; • undertake a periodic review mission; and • undertake a joint midterm review mission with the Government.
CIF/PPCR	Provide grant financing to the Government of PNG for the implementation of the 'Building Climate Resilience in PNG Project

ANNEX 7: TERMS OF REFERENCE—ENVIRONMENTAL MANAGEMENT SPECIALIST

1. The Environmental Management Specialist will be responsible for ensuring the quality and timeliness of the project activities relating to improved climate change resilience and overall to ensure that the Project follows the provisions of any previous environmental assessments to ensure that identified impacts are minimized and mitigating actions undertaken.

2. The Specialist will have a minimum Master's Degree in a relevant field and at least 5 years' experience working on environmental issues (and preferably also climate change resilience) in PNG. The Specialist will:

- (i) Develop guidelines and design/implement training programs for the integration of climate change considerations into the environmental assessment process based on the guidelines developed by the South Pacific Regional Environment Program in collaboration with the Caribbean Community Climate Change Centre;
- (ii) Assist in facilitating participatory planning and governance activities and the implementation of the initial environmental examination recommendations; their proposed construction technology, and project implementation plan to identify any potential adverse impacts;
- (iii) Regularly review and report on the impact of project actions on the environment and determine the nature and extent of environment impact, if any, caused by sub-project;
- (iv) Assist the OCCD in reviewing all infrastructure designs, their proposed construction technology, and project implementation plan to identify any potential adverse environmental impacts;
- (v) Undertake training of staff of the PMU to carry out IEE for subprojects and other project interventions, awareness-building of and motivating stakeholders/beneficiaries on environmental issues;
- (vi) Monitor the EMP and compliance progress toward the expected outcomes, verify monitoring information to identify adverse environmental impacts, document results, identify the necessary corrective actions, and reflect them in a corrective action plan;
- (vii) Take responsibility for the effective transfer of climate resilience principles to other key PMU staff, and other stakeholders in the detailed design, construction and operation/maintenance of project initiatives;
- (viii) Assist and cooperate with other specialist members of the PMU under the direction of OCCD.

ANNEX 8: CONSULTATIONS CONDUCTED DURING THE PPTA

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
Kwaraiwa Island Community	Women's Focus Group	Lois Nakmai & Ursula Rakova,	Discussed women's issues and needs and developed a priority list for interventions.
	Men's Focus Group	Anton Goie and Albert Milala	Discussed and prioritized issues from the men folks' perspective.
	Youth Focus Group	Emmajil Bogari-Ahai, Luanne Losi & Charlotte Vada	Discussed and prioritized young peoples' concerns and issues.
	Whole community	PPTA team & OCCD	Discussed priority list from the focus groups and prioritized actions for interventions
United Church	Baso Kabilua, Pastor	PPTA/OCCD	Discussed the use of the church for shelter in the event of disaster.
Kwaraiwa school	Eli Russel, Head Teacher	PPTA/OCCD	Climate change awareness raising
Kwaraiwa Health Centre	Florina Rubin, Sister in Charge	PPTA/OCCD	Discussed incidences of various health issues recorded at the health centre
Kwaraiwa Conservation International	Conservation International staff and Volunteer	Kidilon	Discussed CI marine programme on the island.
Carterets Island community	Women's Focus Group	Emmajil Bogari-Ahai and Ursula Rakova	Discussed issues affecting the lives of the people as a result of climate induced impacts and what they view as priorities for intervention.
	Men's Focus Group	Anton Goie	
Woroav village, Tinputz	Relocated Carterets families	Ursula Rakova	Detailed report (18 th October 2013) on the issues facing seven resettled families as seen by them. List of main achievements, priority areas still to be addressed, and action required.
PNG Ports Corporation Ltd, Moresby	<ul style="list-style-type: none"> • PNG Ports Corporation Board of Directors • Vagi Eoima, Manager-Engineering 	Jacob Ekinye , Director Adaptation, (OCCD) Lois Nakmai, (PPTA) Jonah Auka (OCCD) and Jayath Atukorola(PPTA) PPTA/OCCD	Discussed SPCR's component 3-Climate Resilient Infrastructure sub-component 1. This meeting was to gauge PNG Ports commitment towards this particular component. The project will assist PNG Ports to develop better climate proof infrastructures such as jetties and wharves using PNG Ports resources. The project will not build new wharves or jetties but will assist in improving PNG Ports services within the selected provinces. Attended SPCR mid-term review meeting.

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
Carterets Council of Elders	Name of President/Chairman?	Anton Goie Ursula Rakova	Issues discussed?
Carterets School	Name of Principal	Anton Goie, Ursula Rakova & Emmajil Bogari-Ahai	
Carterets Health Centre	Name of person in charge	Anton Goie, Ursula Rakova and Emmajil Bogari-Ahai	
PNG Ports Corporation Ltd, Lae	<ul style="list-style-type: none"> Chris Mansing, Operations Manager of Lae Port 	Apolonio Capiral	Discussed organization, operation and maintenance of port. Also discussed budget, design, upgrading of facilities and equipment, construction and procurement of civil works contractors.
Lae Port Development Project (Tidal Basin Project)	<ul style="list-style-type: none"> Ila Mari, IPBC Project Director 	Apolonio Capiral	Discussed possible upgrading of facilities for climate proofing
PNG Ports Corporation Ltd, Buka	<ul style="list-style-type: none"> Joe Turi, Buka Port Operations Manager James Torawa, CEO for Chief Administrator (Chris Siriosi) Mathew Borua, Technical Officer 	Apolonio Capiral	Discussed organization, operation and maintenance of port. Also discussed budget, design, upgrading of facilities and equipment, construction and procurement of civil works contractors. Port security was also discussed. Discussed provincial wharves and jetties in Autonomous Region of Bougainville, operation, maintenance, budget and design, and construction of proposed wharves
Kokopau private Wharf, Pinakokoia Land Group	<ul style="list-style-type: none"> Francis Henesi, Operations Manager 	Apolonio Capiral	Discussed organization, operation, maintenance and budget for port.
Ministry of National Planning & Monitoring	<ul style="list-style-type: none"> Honorable Charles Abel, MP-Minister Sam Engeli, Economic & Financial Misty Baloiloi Dilli Bhattore, Team Leader-Responsible sustainable development strategy 	Varigini Badira, Emmajil Bogari-Ahai, Marilou Drillon, George Romilly & Lois Nakmai	Discussed Minister's planning program and Climate Change Trust Fund and linking to Green Fund.
Ministry of Forest and Climate Change	<ul style="list-style-type: none"> Honorable Patrick Pruaich, MP-Minister Dr Wari Iamo, Climate Change Advisor 	George Romilly, Varigini Badira & Jacob Ekinye	Discussed Trust Fund and the NEC submission for legislation.
Department of National Planning and Monitoring	<ul style="list-style-type: none"> Monica Lopuyai Kelly Kabilo Reicheit Thanda Paul Enny, DICL Consultant 	Who interviewed them? Anton Goie, Lois Nakmai, Jacob Ekinye PPPTA/OCCD	Issues discussed <ul style="list-style-type: none"> Clarify and verify fund flow of grant from ADB to OCCD and to get this understanding in writing. Attended SPCR Inception Meeting
Department of Agriculture and Livestock	<ul style="list-style-type: none"> Daisy Lepon, Project Manager – GFDRR Stanley Oa, Acting Chief Land Use Officer, Land Use Section 	George Romilly, Lois Nakmai, Luanne Losi PPTA/OCCD	<ul style="list-style-type: none"> Discussed the set-up of PMU Discussed implementation role in SPCR component 2.1 including soil mapping, etc. Attended SPCR Inception Meeting

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
	<ul style="list-style-type: none"> Mika Andrew, PACC Coordinator 		<ul style="list-style-type: none"> Attended SPCR mid-term review meeting and assisted in identifying hot spots for food security.
Department of Works	Crusoe Dili, Project Manager – World Bank Project	George Romilly, Lois Nakmai, Luanne Losi	<ul style="list-style-type: none"> Discussed the PMU set up in DoW. Attended SPCR Inception Meeting.
Department of Environment and Conservation	<ul style="list-style-type: none"> Gunther Joku, Acting Secretary, Maino Viropo, Deputy Secretary, Policy Gerard Natera, Manager-GIS Arthur Ganubella, Assistant Manager Fredrick Ohmana, NP Branch Malcolm Keako, TEM Branch 	George Romilly Luane Losi James Berdach, Lois Nakmai Rose Godana	<ul style="list-style-type: none"> Discussed work on CC vulnerability in Morobe (Bumbu), and piloting of early warning system Explained PNG Environmental categorization system: Level 1 – negligible impacts Level 2a (less) or 2b (more) impacts, requires inception report and permit application Level 3 – significant impacts, requires full EIA Discussed GIS needs Attended SPCR Inception Meeting
Department of Lands and Physical Planning (National)	<ul style="list-style-type: none"> Juliana AWUKO-Manager: Development Assessment, Linus Billy-Manager: Physical Planning Policy, Weleni Yaki-Principal Policy Officer Simon Thomas, GIS Administrator Angu'u Kikala, Principal Research Officer Angeline Samisih, Development Planning Coordinator (Southern) Emily Mulina, Research Officer 	Anton Goie, Jonah Auka (OCCD), Albert Milala(OCCD) and Ursula Rakova. Rose Godana PPTA/OCCD	The meeting was to discuss Component 1.1 – Climate Change Vulnerability Mapping and Adaptation Planning. The Office of Chief Physical Planner (OCP) was informed by OCCD in this meeting that proposed plan to have a resettlements plan for Carterets will now be focused on Tinputz. OCP will assist OCCD to ensure that the vulnerability plan for Tinputz is incorporated into the physical planning framework particularly in relation to the development planning processes. <ul style="list-style-type: none"> Attended SPCR mid-term review meeting. Attended SPCR Inception Meeting
Department of Lands and Physical Planning (AGoB)	<ul style="list-style-type: none"> Andrew Dovaro, CEO – Lands & Physical Planning & Environment Henry Stalei, Land & Physical Planning 	Anton Goie Ursula Rakova	<ul style="list-style-type: none"> Discussed the possibility of DLPP assisting project with land use planning for relocated Carteret Islanders at Tearuki

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
Department of Provincial and Local Level Government	<ul style="list-style-type: none"> Jennifer Adema, Director, Performance Management and Coordination Division Terence Marain, Assistant Director, Performance Management and Coordination Division 	Apolonio Capiral, Lois Nakmai	Discussed role of DPLLG in provincial infrastructures in particular wharves and jetties.
Department of Finance	Marlene Philip	Jacob Ekinye,	Clarify and verify fund flow of grant from ADB to OCCD and to get this understanding in writing.
Department of Treasury	<ul style="list-style-type: none"> Lumbe Silai John Uari 	Jacob Ekiny, Anton Goie, Lois Nakmai, Albert Milala	Issues discussed? Clarify and verify fund flow of grant from ADB to OCCD and to get this understanding in writing.
Dept of Mineral Policy and Geohazard Management	Elizabeth Micheal, Eng Geologist	PPTA/OCCD	Attended SPCR Inception Meeting
DIRD (Office of Rural Development)	Lorna Kapo, Data Analyst	PPTA/OCCD	Attended SPCR Inception Meeting
National Economic and Fiscal Commission	Elizabeth Babate	Apolonio Capiral, Lois Nakmai	Collected data (Geobook etc) as a result of being referred to NEFC from DPLLG.
National Fisheries Authority	<ul style="list-style-type: none"> Leban Gisawa, Inshore Fisheries Manager Rachel Rabi, Fisheries Management Officer, Inshore Fisheries 	Luanne Losi James Berdach	<ul style="list-style-type: none"> Discussed implementation role under SPCR component 2.2. Have inshore fish aggregating devices program for food security. Deployed in Manus, MB, and E. Sepik. Fishers report catching more fish but lack market outlets.
National Department of Health and HIV/AIDS	<ul style="list-style-type: none"> Josing Salimba, T/O-CCJ HLTH Ken Neyakawapa, Program Manager, Environmental Health Joel Kolam, Manager, Environmental Health Division, Ray Kangu, Program Officer, Water Supplies Eileen Dogimab, Technical Assistant, Nutrition Teresa Zurenuoc, Technical Officer, Sustainable Health, Environmental Health Division 	PPTA/OCCD Emmajil Bogari-Ahai, George Romilly, Lois Nakmai, Lois Nakmai, Anton Goie, Ursula Rakova & Emmajil Bogari-Ahai	<ul style="list-style-type: none"> Attended SPCR Inception Meeting To inform of the SPCR and advise that component 1.4 will be implemented by Health Dept. Provided brief on SPCR Informed that component 1.4 will be implemented by the Dept. Requested for information to design component 1.4 Advised of visit to Carterets Attended SPCR mid-term review meeting.

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
	<ul style="list-style-type: none"> Melinda Susapu, Entomology Technical Officer, Malaria and Vector Borne Disease Division 		
National Disaster Centre, Dept of Provincial and Local Level Government Affairs	<ul style="list-style-type: none"> Martin Mose, Director-National Disaster Centre Andrew Oaego, A/Assistant Director-National Disaster Centre Kaigabu Kamnanaya, Assistant Director, Risk Management Philomena Emilio, Training Manager Kaigabu Kamnanaya, Assistant Director – Risk Management 	<p>George Romilly & OCCD George Romilly and Emmajil Bogari-Ahai</p> <p>James Berdach and Lois Nakmai</p> <p>Wendy Lee & Ursula Rakova</p> <p>Lois Nakmai, Rex Tawian & Albert Milala</p>	<ul style="list-style-type: none"> Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Attended SPCR Inception Meeting. Discussed need for high frequency radios for communications; explained relationship between NDC and PDCs; information on four training courses: <ul style="list-style-type: none"> - Introduction to Disaster Management - Initial Damage Assessment - Comprehensive hazard and risk management - Community based DRM (so far trialled only in WNB and Morobe) Examined training manual “Community – based Disaster Risk Mgt: A Training and Field Handbook”. Said that materials could not be shared with SPCR, but will give training to those provincial admin. identifies. Gave names of useful contacts. Identified main assistance required for small island resiliency: <ul style="list-style-type: none"> - HF radios / communications - Boats - Water supplies - Food security - Awareness raising - Education, health and poverty reduction Discussed capacity to implement component 1.3 of SPCR Discussed costs for disaster management
National Border Authority	<ul style="list-style-type: none"> Kotu Akema, Director 	Wendy Lee and Ursula Rakova	Overview of BDA and its commercial arm, PNG Maritime Transport Ltd. Investigation of the 7 vessels it owns and whether they could be useful for the project. Not feasible as six are out of action with problems.
Geophysical Observatory of	<ul style="list-style-type: none"> Dr Chris Mckee, Acting Director-Port 	PPTA/OCCD	Special climate change technical working group

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
Department of Mineral Policy and Geohazard Management	<p>Moresby Geophysical Observatory</p> <ul style="list-style-type: none"> Mathew Moihoi, Seismologist-Port Moresby Geophysical Observatory 		meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Attended the SPCR Inception Meeting and discussed early warning systems.
GMP ENG	Raymond Yamai,. Geol Branch Assist Director	PPTA/OCCD	Attended SPCR Inception Meeting.
Department of Personnel Management Department	<ul style="list-style-type: none"> Yetrus Buka, HRAs Officer Maureen Korua, HRAs Officer Matilda Kowos, HRAs Officer 	George Romilly, Lois Nakmai, Rose Godana	Discussed how scholarships are managed for public sector officers and how scholarships under SPCR can be utilised.
PNG National Weather Service,	<ul style="list-style-type: none"> Samuel Maiha, Acting Director Kasis Inape, Assistant Director, Climate & Special Services Tau Gabi, Assistant Director 	<ul style="list-style-type: none"> George Romilly & OCCD Apolonio Capiral and Emmajil Bogari-Ahai PPTA/OCCD Apolonio Capiral and Lois Nakmai 	<ul style="list-style-type: none"> Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Attended the SPCR Inception meeting Followed up on information on extreme weather patterns over the last 30 years,
National Agricultural Research Institute	<ul style="list-style-type: none"> Cliffon Gwabo, Senior Scientist-Agriculture and Resource Economist Amanda Mararuai, Senior Entomologist, James Ernest, Senior Agronomist Marrige Oromu Anton Mais - Laloki Project Leader-Post Harvest 	PPTA/OCCD	<ul style="list-style-type: none"> Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Attended SPCR Inception Meeting <ul style="list-style-type: none"> Discussed implementation role in SPCR component 2.2 and identification of food security hot spots for islands /atolls. Attended SPCR mid-term review meeting and assisted in providing rationale for the selection of pilot sites.
National Statistical Office	Fredryck Kali	Lois Nakmai, George Romilly, Rose Godana	Enquired on latest population figures for the 20 pilot sites in the 5 pilot provinces and paid for the data.
University of Papua New Guinea		Rose Godana Luanne Losi ?	Consultation about GIS systems within government and other organisations.
Conservation International PNG	<ul style="list-style-type: none"> David Mitchell, Director PNG, Alotau George Aigoma 	PPTA/OCCD	Consulted at the SPCR Inception phase

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
The Nature Conservancy	<ul style="list-style-type: none"> Francis Hurahura, Director 	James Berdach	
Wildlife Conservation Society	<ul style="list-style-type: none"> Mazzella Maniwavie, Research Officer John Kuange, Team Leader, Community Engagement 	<ul style="list-style-type: none"> PPTA/OCCD Wendy Lee James Berdach 	<ul style="list-style-type: none"> Attended SPCR Inception Meeting. Discussed marine programs on Andra Is. (Manus) and New Ireland. Looked at coral farming for lime as livelihood option. Coral propagation tables have unintended benefit in that they attract fish. Fishing expensive due to transport costs, and dangerous seas. Provided information on marine resources, and contacts to provide WCS reports.
Mama Graun Trust Fund	<ul style="list-style-type: none"> Leo Bualia, Acting Executive Director 	Lois Nakmai & Jacob Ekinye Jacob Ekinye	Looked at small grants program (which is mainly for conservation and protected areas), to see if they could manage funds for Climate Change adaptation projects. Good lessons learned, but MG are having trouble sustaining their funding base. Not clear whether they have capacity to provide this service for SPCR.
CARE Australia, PNG	Andrea Dekraut, PM – Climate Change Adaptation (based in ABG)	Anton Goie and Ursula Rakova	
PNG Red Cross	<ul style="list-style-type: none"> Warren Dagen, Communication and Dissemination Officer Jerry Mua, National Program Manager Michael Sembonombo, National DRR Coordinator 	George Romilly & OCCD Emmajil Bogari-Ahai & Albert Milala PPTA/OCCD	<ul style="list-style-type: none"> Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Discussed SPCR and Red Cross ability/capacity to manage disasters, RC informed that have community based preparedness program and can do the training and they have response manuals. Attended SPCR mid-term review meeting.
ADB	<ul style="list-style-type: none"> Muhammad A. Ingratubun, Unit Head, Portfolio Management, PNG Resident Mission Marcelo Mirc, PNG Country Director Marilou Drilon, Senior Natural Resources Economist, Manila Terry Heap, Asian Development Bank Consultant Patricia Nagum, Asian Development Bank Project Officer Tahir Qadri, Asian Development Bank 	George Romilly, Jayath Atukorala	<ul style="list-style-type: none"> Discussed project procurement and port of Lae upgrading costs, experience with other ADB PMUs and logistical issues of project implementation and obtained specifications drawings for Lae Port. Attended SPCR Inception meeting and the Mid Term Review meeting.

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
	Consultant <ul style="list-style-type: none"> Benoit Laplante, Asian Development Bank Consultant 		
United National Development Programme	<ul style="list-style-type: none"> Gwen Maru, Program Analyst for Energy and Environment Tamalis Akus, Small Grants Programme Christie Mahap SGP Program Assistant 	George Romilly, Wendy Lee, James Berdach, and Lois Nakmai	<ul style="list-style-type: none"> Given overview of climate change and environment related activities of UNDP; Investigated methods of operating UNDP Small Grants programme (GEF) which has \$2.5 million; discussed whether SPRC Trust Fund could be aligned with, or operated through the UNDP small grants system. Looked at the mapping and assessment done in Morobe Province and agreed need for more collaboration between SPCR and UNDP especially in Morobe. CSIRO did vulnerability aping in 2 LLGs in WNB Attended SPCR Inception Meeting
World Bank	Allan Oliver, Operations Officer-Rural Development, Natural Resource & Environment	George Romilly & OCCD George Romilly & Jacob Ekinye	<ul style="list-style-type: none"> Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Discussed the architecture of the climate change trust fund.
European Union	Clement Bourse	George Romilly & Jacob Ekinye	Discussed the architecture of the climate change trust fund.
International Office of Migration	<ul style="list-style-type: none"> Marjorie Andrew George Gigani, Chef de Mission Wonesai Workington Sithole, DRR & CCA Manager Andrea ? 	George Romilly & OCCD George Romilly & Jonah Auka	<ul style="list-style-type: none"> Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Attended SPCR Inception Meeting Discussed capacity building of PNG to respond to climate change and engaging of grassroots structures in developing planning for the Atolls.
AusAID	<ul style="list-style-type: none"> Director, Buka Office Nige Kaupa, Dept of Foreign Affairs and Trade 	Anton Goie Wendy Lee and Ursula Rakova	<ul style="list-style-type: none"> Discussed request from ABG for financial support for emergency food aid. Looked at more sustainable options, and what other agencies were doing. Suggested that AusAID could support agricultural production at resettlement sites and ship food back to

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
			<p>Carterets.</p> <ul style="list-style-type: none"> Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Attended SPCR Inception Meeting.
USAID	Julie Hulama, Development Specialist	PPTA/OCCD	Attended SPCR Inception Meeting
Manus Provincial Administration	David Posile, OIC Environment & Climate Change	PPTA/OCCD	Attended SPCR Mid Term Review meeting and confirmed pilot sites in Manus.
Morobe Provincial Administration	Taikone Gwakoro, Principal Program Advisor-Mineral Environment & Climate Change	PPTA/OCCD	Attended SPCR Mid Term Review meeting and confirmed pilot sites in Morobe.
East New Britain Provincial Administration	Blaise Magaga, Advisor-Agriculture and Livestock Division	PPTA/OCCD	Attended SPCR Mid Term Review meeting and confirmed pilot sites in East New Britain.
Milne Bay Provincial Government	Michael Kape, Provincial Administrator Eric Balaria, Provincial Disaster Coordinator Lionel Misa, Environmental Officer Sharon Mua, Provincial Planner	SPCR PPTA Team & OCCD Jayath Atukorala	<ul style="list-style-type: none"> Consulted during the Inception phase. Briefed Provincial Administrator on SPCR and informed the Administrator that Milne Bay Province is one of the 5 pilot provinces for SPCR and that the team was on its way to one of the pilot sites to do vulnerability mapping. Attended SPCR Mid Term Review meeting and confirmed pilot sites for Milne Bay.
Autonomous Government of Bougainville	<ul style="list-style-type: none"> Thomas Sansan, District Officer, Special Duties John Lolan, Planning Officer – JICA/BBP Peter Kolotien, ABG Mining Department – Geologist Lesley Sion, ABG Mining Department – Environmental Scientist Kevin Anana, Fisheries Officer – Atolls District Gavin Reynolds, Environmental Advisor- Bougainville Environ. Bureau Julius Nohu, Atolls Resettlement Program Andrea De Silva, Atolls Resettlement Program 	Anton Goie, Ursula Rakova & Emmajil Bogari-Ahai	

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
	<ul style="list-style-type: none"> Kenneth Konol, DPI Atolls Catherine Welbia, Economic Planner Gabriel Wayen, Division of Primary Industry Hon. Joe Lera, MP. Regional Member for Bougainville 		
TE PNG	Dave Wood	Lois Nakmai, Anton Goie, Albert Milala	Discussed equipment specifications for disaster risk management and to quote for installing the equipment in the 20 pilot sites.
PNG Forest Research Institute, Climate Change Unit	Prof. Simon Saulei	Lois Nakmai	Sought his consent to use information in his Team's V&A Report on Siassi group of islands.
A representative from Siassi Island	Peter Samuel - Student studying in Seoul, Korea	Lois Nakmai	Wrote to him seeking any information on Siassi Islands and he forwarded the V&A report for Siassi and advised to seek Prof Saulei's consent before using the information.
Consultant to the Adaptation Fund	Stacey A. Tighe, Ph.D. Coastal Marine Science and Policy Specialist	Lois Nakmai & Emmajil Bogari-Ahai	Shared information on the development of disaster risk management plan done in Indonesia after the tsunami.
Secretariat of the Pacific Community (SPC)	<ul style="list-style-type: none"> Dean Solofa, Climate Change Officer-Land Resources Division Sala Elbourne, Laboratory Team Leader – Public Health Division, Noumea Makareta Lomaloma, Energy Efficiency Adviser Jens Kruger, Acting Deputy Director-Oceans and Islands Program Brian Dawson, Climate Change Adviser Lindsay Chapman, Manager-Coastal Fisheries Program, Noumea 	PPTA/OCCD	Attended the SPCR mid-term review meeting and discussed synergies and linkages with the regional SPCR.
Secretariat of the Pacific Regional Environment Programme (SPREP)	Espen Ronnenberg, Climate Change Adviser Andre Volentras, SPREP/JPC Consultant	PPTA/OCCD	Attended the SPCR mid-term review meeting and discussed synergies and linkages with the SPREP climate change programmes.
Coastal and Inland Fisheries Development Authority	Ronald Kuk, Manager-Economics and Planning	PPTA/OCCD	Discussed implementation role in SPCR component 2.2 and attended SPCR mid-term review meeting
Office of the State Solicitor	Ruel Yamuna, Senior Legal Officer (General Commercial)- Commercial Law	George Romilly & Jacob Ekinye	Discussed the architecture of the Climate Change Trust Fund
PNG Forest Authority, National Forest Service	Goodwill Amos, Manager-REDD & Climate Change	George Romilly & Jacob Ekinye	Discussed the architecture of the CCTF.
Civil Society Community Representative	Tanya Zeriga Alone,	George Romilly & OCCD	Special climate change technical working group meeting convened to determine the best option

Organization/ Group	Persons met	Consultant / OCCD staff	Comments / outcomes
			for use of the additional US\$5 million allocated to PNG by the PPCR-SC.
LEAF PNG	Roy Banka, REDD+ Coordinator	George Romilly & OCCD	Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC.
National Research Institute (NRI)	Dr Justin Ondopa Land Research	George Romilly & OCCD	<ul style="list-style-type: none"> Special climate change technical working group meeting convened to determine the best option for use of the additional US\$5 million allocated to PNG by the PPCR-SC. Consulted for Inception phase.
Sunday Chronicle	Matthew Vari, Journalist	PPTA/OCCD	Attended the SPCR Inception Meeting
The National Newspaper	Fidelis Sukina, Journalist	PPTA/OCCD	Attended the SPCR Inception Meeting
MSOP	Joseph Aihi, Climate Change Activist	PPTA/OCCD	Attended SPCR Inception Meeting

ANNEX 9: Template for Recording and Reporting Consultations

Summary of Key Information Required for Consultation

CONSULTATION METHOD	DETAILS OF ACTIVITIES	CONSULTATION OUTCOMES
Public notice	Date(s) of notice	n/a
Location of notice		
Newspaper notification	Date(s) of notice	n/a
Name of newspaper		
Public announcement/ radio	Date(s) of announcement	n/a
Time(s) of announcement		
Newsletter / questionnaire	Date(s) sent	Number received
Number sent	Main issues raised	
Area of distribution		
Feedback sought (Yes / No)		
Public meeting	Date(s) held	Meeting minutes attached (Yes / No)
Location(s) held	Attendees	
Invitees		
Methods of invitation		
Agenda attached (Yes / No)		

Note: You may need to include agendas, list of attendees, minutes of meetings etc. as annexes to the EMP.

Example of Meeting Minutes Documentation

Name of Subcomponent:

Location:

Date:

Time:

Location:

MEETING AGENDA

1. Introduction

2. Presentation and key points.....:

PARTICIPANTS

Name (if possible) number, associated organization, gender.

QUESTIONS / COMMENTS OF PARTICIPANTS AT MEETING

1.

2.

3.

4. etc

REPLIES OF PRESENTORS

1.

2.

3.

4. etc

The meeting was adjourned at XXX (time) the same day.

Signed by person taking minutes:

Position: