

**THE GOVERNMENT OF PAPUA NEW GUINEA**  
**ENVIRONMENT IMPACT STATEMENT (VOL 2)**

**PRODUCTIVE PARTNERSHIPS IN AGRICULTURE PROJECT (PPAP)**  
**ADDITIONAL FINANCING**

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**ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK**  
**Updated**  
**(ESMF)**

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## Executive Summary

This Environment and Social Management Framework (ESMF) was prepared by the Government of Papua New Guinea in order to comply with the requirements of the World Bank environmental and social safeguard policies. It establishes the guidelines and procedures to be followed in assessing the potential environmental and social impacts of the activities to be financed under the PPAP, and in setting out mitigation, monitoring and institutional measures during the implementation of the project to eliminate, offset, or reduce any adverse environmental and social impacts. This updated version incorporates the changes and innovations adopted during three years of project implementation, and additional measures to address emerging social issues under the Additional Financing.

The document is organized into four parts: Part I is the Environmental Management Framework which lays out the process and procedures for complying with the World Bank's Environmental Assessment Policy (OP/BP 4.01) as well as the GoPNG Environmental Impact Assessment law. Part II is the Integrated Pest Management Plan (IPMP) which is required under the World Bank's Pest Management Policy (OP/BP 4.09). Part III is the Indigenous Peoples Policy Framework which provide for a process of free and prior informed consultation and attainment of broad community support as required under World Bank's OP/BP 4.10 while Part IV is the Land Acquisition and Resettlement Framework (LARF) which provides for the process and requirements of the acquisition of land and compensation of affected private assets.

***Activities under the project which may have environmental or social impacts*** – The development objective of PPAP is to improve the livelihoods of smallholder cocoa and coffee producers through the improvement of the performance and the sustainability of value chains in cocoa- and coffee-producing areas. The project will have three components: Component 1 (Institutional Strengthening) which involves strengthening of coffee and cocoa sector institutions; Component 2 (Productive Partnerships) which involves farm production support through farmer-agribusiness partnerships; and, Component 3 (Market Access Infrastructure) which involves construction and rehabilitation of market access infrastructure such as feeder roads, paths, wharves and jetties. The farm and infrastructure activities under Component 2 and Component 3 are the ones that would likely have environmental and social impacts and hence are subject to this ESMF.

***Locations of the project activities*** – The farm and market infrastructure activities are currently being implemented in coffee-growing areas of the highland provinces, particularly Eastern Highlands, Jiwaka, Simbu and Western Highlands, and in the cocoa-growing areas of East New Britain and the Autonomous Region of Bougainville. The Additional Financing will enable the project to cover more areas within these provinces as well as in other coffee- and cocoa-growing provinces of the country. Since the interventions under Component 2 and 3 are fully demand-driven by communities and their partners, their specific locations can be identified only during evaluation of individual partnerships or infrastructure proposals. Thus, this ESMF provides the procedures for assessing the environmental and social aspects of these interventions once their type and location become known. However, based on partnerships already under implementation under the Original Financing, farm interventions and infrastructure would be situated in highly modified environments and away from sensitive environments and protected areas.

***Environmental and Social Management Framework (ESMF)*** – The Environmental and Social Management Framework provides guidelines and procedures for screening, preparing and evaluating proposals for partnerships and infrastructure proposals in terms of compliance with the World Bank's and GoPNG's environmental and social safeguards requirements. Under the framework, all proposals shall first undergo environmental and social screening to screen out ineligible activities and determine specific requirements. The following is a summary of processes involved and their documentary requirements:

**Table a. Environmental and social safeguards preparation, review, approval and monitoring process and requirements for productive partnership proposals**

Stage	Safeguards Review Process and Documentary Requirements
1. Identification (Submission by Applicant of Initial 2-page Proposals)	The PMU Component 2 Coordinator with support from Environment Specialist identifies any potential environmental or social issue and advise qualified Applicants to address them in their full proposals
2. Preparation of Full Proposal Package	Applicants to: <ul style="list-style-type: none"> <li>• Undertake informed consultation and secure broad community support to the proposal following the guidelines in the IPPF;</li> <li>• Conduct quick environmental and social scanning/assessment of the proposed partnership communities with particular focus on gender issues, malnutrition and family food security, illiteracy/numeracy, alcoholism and HIV/AIDS;</li> <li>• Undertake complete screening of planned activities using the ESSF;</li> <li>• Prepare Environmental and Social Management Plan (ESMP) based on the result of the assessment and screening; and,</li> <li>• Further develop the Partnership proposal to incorporate measures identified in the ESMP.</li> </ul> Applicants to prepare/secure the following safeguard documents and submit as part of the full proposal package: <ul style="list-style-type: none"> <li>• Evidences of prior consultation and broad community support</li> <li>• Completed Screening</li> <li>• ESMP following the Template</li> <li>• Other documents such as required such as Voluntary Land Use Agreements</li> </ul>
3. Review of Proposals	PMU Component 2 Coordinator with support from Environment Specialist as needed, to review the safeguards aspect of the proposal package focusing on the following documents: Completed ESSF; ESMP; Evidences of Prior Consultation Conducted and Broad Community Support; Program of Activities; Voluntary Land Use Agreements (if required); and the Partnerships proposed Program of Activities. The PMU will also conduct field validation of these documents. Based on the review, the PMU may require further refinements to the proposal or clear it for TAC appraisal.
3. Appraisal	The Technical Appraisal Committee (TAC) reviews the proposals and ranks them using a Score Sheet and endorses selected proposals for ICC approval or rejection.
4. Approval/Rejection	The Industry Coordinating Committee (ICC) formally confirms approval or rejection of proposals and Applicants are advised accordingly.
5. Implementation and Monitoring	The Lead Partners and the Farmers undertake the ESMP measures as part of the Partnership Program of Activities. The PMU M&E Specialist monitors compliance of ESMP.

**Table b. Environmental and Social Safeguards preparation, review, approval and monitoring process and documentary requirements for Market Access Infrastructures**

Stage	Process and Documentary Requirements
Investment Identification	PMU Senior Engineer with support from the Environment Specialist and Community Liaison Officer conducts initial screening as part of field assessment; and, initial consultation with communities and other stakeholders; documents the consultation process following the IPPF.
Eligibility Screening	PMU Senior Engineer conducts eligibility screening and full environmental and social screening using the ESSF and determines the requirements that would apply such as: ESMP; Evidence of FPIC and BCS; Land/Road Right of Way Acquisition Documents; Compensation Agreements/Plan; Feasibility Study/Project Description and Detailed Engineering incorporating ESMP measures; and GoPNG Requirements (i.e. whether an EIA is required; The

	PMU may register the infrastructure proposal with DEC for screening under the ERF).
Preparation of Proposal Package and Documentary Requirements	<p>PMU Infrastructure team:</p> <ul style="list-style-type: none"> <li>• Prepares/secures the safeguard documents as determined during the screening;</li> <li>• If the infrastructure activity falls within Level 2 or 3, the PMU shall cause the conduct of EIA and preparation of the EIS according to the PNG EIA process. Otherwise, the PMU will conduct a quick environmental and social assessment/scanning of the site and influence area of the proposed infrastructure and based on the assessment, prepares the ESMP following the ESMP template for infrastructure;</li> <li>• The PMU shall further develop the Project Description/Feasibility Study, Detailed Engineering or Program of Work based on the results of the EIS or the ESMP;</li> <li>• Land use agreements for temporary access and/or compensation plans for affected crops and assets, if required, should be pursued following the LARPF.</li> <li>• Further consultations with the communities and other stakeholder should be undertaken during the project preparation following the IPPF.</li> </ul>
Full Review of Proposal Package	PMU Infrastructure team supported by the Environmental Specialist checks for completeness of safeguard requirements and evaluates the safeguard aspects of the proposal package. If found compliant and sound, the team clears the proposal for endorsement by the PMU to the Industry Coordinating Committee (ICC).
Approval by ICC	ICC acts on the recommendations of the PMU
Final Consultation with Stakeholders	PMU Senior Engineer and Community Liaison Officer conduct further consultation with stakeholders and facilitate the signing of Memorandum of Understanding (MOU) on road maintenance with the concerned LLG and beneficiary communities.
Detailed Engineering Design and preparation of Bidding Documents	PMU Infrastructure team to ensure that ESMP measures are considered in the detailed engineering design or incorporated in the Program of Works.
Procurement and Bidding	PMU Infrastructure team to ensure that standard clauses as per section 6.0 of this ESMF as well as the relevant measures in the ESMP are integrated in bidding documents
Construction and Compliance Monitoring	PMU ensures that ESMP measures are undertaken as part of the infrastructure program of works. The M&E Specialist conducts periodic compliance monitoring on the ESMP during construction.
Operations and Maintenance	ESMP measures that are part of the maintenance program, if any, are undertaken.

***Integrated Pest Management Plan (IPMP)*** – The IPMP aims to increase awareness of smallholders to the negative impacts and the efficient and safe use of pesticides, and introduce them to Integrated Pest Management (IPM) approach in controlling pest and reduce losses. The plan basically focused on the addressing the current cocoa pod borer (CPB) infestation and the threat of coffee cherry borer (CBB) pest arriving in PNG. The control strategy focused on good cultural practices, including weed cleaning, shade reduction, frequent complete harvest dubbed “Every Pod, Every Tree, Every Week”, burying of infested pods, and target spraying. The long term strategy however is to replace cocoa trees with high yielding, CPB-resistant clones that have been developed by the CCIL. Thus, in the long term pesticide use would be greatly reduced. For CBB, the approach is to do surveillance and raise awareness and preparedness through a contingency plan. The plan emphasizes the safe use of pesticides and herbicides and ensures that banned pesticides will not be used. The plan has also identified existing IPM practices in both cocoa and coffee which can be adopted and further developed in the project such as those that have been field tested by ACIAR for cocoa. PPAP activities will include support for training of farmers and other stakeholders on IPM strategies for the control of the CPB, as well as resources for the implementation of the response plan.

***Indigenous Peoples Policy Framework (IPPF)*** –The great majority of the rural population of PNG are indigenous people. Given that the project itself benefits the indigenous population, no separate Indigenous Peoples Development Plan (IPDP) is required. Instead, the key elements of an IPDP have been integrated in the project design. Moreover, strong community support at the project level has been evident during the community consultations carried out as part of the EA and SA, and during the three years of project implementation. To ensure free and prior informed consultation (FPIC) are undertaken and broad community support (BCS) is achieved for each Partnership and Infrastructure under Component 2 and 3 respectively, a Beneficiaries Participation Framework (BPF) and the Consultation Guidelines have been developed. These were supplemented by a more detailed Consultation Frameworks developed during the project implementation. For the Additional Financing, these documents have been consolidated into Indigenous Peoples Policy Framework. The IPPF provides guidelines on how to undertake FPIC and achieve BCS and identifies evidentiary documents to be secured.

***Land Acquisition and Resettlement Policy Framework (LARPF)*** – Due to potential complexities in land acquisition under customary land ownership system, the project will not finance any activity that requires involuntary resettlement or involuntary land acquisition. Under Component 2, any activity requiring land use, such as rehabilitation and expansion of existing nurseries and the establishment of nurseries and budwood gardens shall be voluntary in nature and will take place within existing facilities. Under Component 3, infrastructure subprojects may possibly result in temporary land use during construction, or damage of crops and economic trees and fences. A Compensation Policy Framework (CPF) has been prepared which details the key principles for land use and compensation for damaged assets should such situation arise. These principles include: (i) consultations with and support from communities as a first step in subproject preparation; (ii) minimization of land acquisition and damage to assets through appropriate design of infrastructure rehabilitation works; (iii) no financing for activities that require relocation of house or displacement of livelihood; and, (iv) the provision of minor land acquisition through voluntary offer of donations only. Templates for land donations or temporary land use agreements have been developed. During the project implementation, voluntary land use agreements have often been forged between the partnership (represented by a Cooperative Society) and the individual members. For the Additional Financing, the CPF and these land use rights instruments have been consolidated into Land Acquisition and Resettlement Framework (LARF).

***Institutional Arrangements*** -The main units responsible for the implementation of the ESMF are the Project Management Units (PMUs) in the CIC and the Cocoa Board, each guided by their respective Industry Coordinating Committees (ICCs). There are currently two PMUs, one for coffee which is based in Goroka and another one for coffee which is based in Kokopo in East New Britain; a Deputy PMU Manager reporting to the Project Manager in Kokopo is currently based in the Cocoa Board office in Buka to oversee the implementation of the project in ARB. Each PMU has a Component 2 Coordinator who is responsible for the management and supervision of partnerships and a Senior Engineer who is responsible for the management and supervision of market infrastructure activities under Component 3. They would also be responsible for making sure that the ESMF is complied with in their Component activities. They will also be supported by a Lands and Community Liaison Officers. In reviewing and approving Partnership and Infrastructure proposals, the PMUs will be supported by the Environmental Specialist/Advisor and the by the Technical Appraisal Committee which include a social development specialist. For the Additional Financing, the same units will initially undertake the environmental and social safeguards requirements. Satellite units and additional personnel may later be added as the need arises.

## 1.0 Introduction

Following the Government of Papua New Guinea's (GoPNG) request for World Bank support to the agriculture sector, the GoPNG and the World Bank agreed in April 2008 on the concept and the outline of the proposed PNG Productive Partnerships in Agriculture Project (PPAP). Project preparation was carried out in 2009 and the ESMF is one of the instruments prepared to support the implementation of the PPAP.

The development objective of the proposed project would be to improve the livelihoods of smallholder cocoa and coffee supported by the Project. This would be achieved through strengthening industry coordination and institutions, expanding and strengthening linkages between smallholder farmers and agribusiness for the provision of market access, technologies and services, and through the provision of critical market access infrastructure.

Key outcomes would be that: (i) smallholder farmers adopt efficient, market responsive and sustainable production practices leading to an increase in their income; (ii) demand-driven productive partnerships are established and sustained; and (iii) key infrastructure bottlenecks in the targeted value chains are addressed.

The proposed project would include the following components:

**Component 1: Institutional strengthening and industry coordination**

**Component 2: Productive partnerships**

**Component 3: Market access infrastructure**

### *Environmental and social safeguards instruments*

Component 2 and 3 of the PPAP follow a demand-driven approach and therefore the specific locations of PPAP activities are not known at the time of project preparation. The **Environmental and Social Management Framework (ESMF)** establishes the guidelines and procedures to be followed to determine and assess future potential environmental and social impacts of activities to be financed under PPAP, and then to set out mitigation, monitoring and institutional measures to be taken during implementation and operation of the project to eliminate, offset, or reduce any potentially adverse environmental and social impacts to acceptable levels.

Furthermore, in compliance with the World Bank's OP 4.12 on Involuntary Resettlement, GoPNG has prepared a **Compensation Policy Framework (CPF) with the updated version now being called Land Acquisition and Resettlement Framework (LARF)**. The LARF constitutes Part 2 of this ESMF. The GoPNG disclose the final version of the ESMF in country so that it is accessible by the general public, local communities, potential project-affected groups, local NGOs and all other stakeholders. The final document will also be disclosed at the Infoshop of the World Bank.

Finally, as per World Bank policy OP4.09, Government has also prepared an **Integrated Pest Management Plan (IPMP)**. The IPMP constitutes Part 3 of this ESMF.

## 2.0 Description of the Project

### Project development objective and key indicators

The development objective of the proposed project would be to improve the livelihoods of smallholder cocoa and coffee producers supported by the Project. This would be achieved through strengthening industry coordination and institutions, facilitating linkages between smallholder farmers and agribusiness for the provision of market access, technologies and services, and through the provision of critical market access infrastructure.

Key outcomes would be that: (i) smallholder farmers adopt efficient, market responsive and sustainable production practices leading to an improvement in their income; (ii) demand-driven productive partnerships are scaled-up and sustained; and (iii) key infrastructure bottlenecks in the targeted value chains are addressed.

### Project components

The project would include three components: (a) Institutional Strengthening and Industry Coordination; (b) Productive Partnerships; and (c) Market Access Infrastructure. The project would be implemented over a five year period.

**Component 1: Institutional Strengthening and Industry Coordination.** The specific objective of this component would be to improve the performance of sector institutions and to enhance industry coordination in the coffee and cocoa sectors. Existing stakeholder platforms for industry coordination would be consolidated to address short- and long-term issues such as sector governance, skills development in the industry, improvement in extension services, industry strategy on threats to quality and quality promotion, information within the industry, market development and crop diversification. This component would have four sub-components as follows:

*Sub-component A: Industry coordination & policy development:* This sub-component would build the capacity of industry coordination committees (ICC) to support sector dialogue and policy development in the cocoa and coffee subsectors.

*Sub-component B: Communication and information management systems.* The project would strengthen the information management systems necessary to inform policy development and stakeholders' decisions in the coffee and cocoa industries.

*Sub-component C: Quality and sustainability management:* This sub-component would strengthen quality promotion in the coffee and the cocoa industries and promote, where appropriate, the adoption of certified sustainability practices (such as Organic, Fair Trade, Rainforest Alliance, Utz, and quality certification schemes);

*Sub-component D: Project management and monitoring and evaluation (M&E).* This sub-component would support all project management and M&E functions in the Project Management Units (PMUs) respectively located in the Cocoa Board and the CIC, as well as a small Project Coordinating Unit (PCU) in DAL. It would also finance the related Technical Assistance (TA) and the operations of the Technical Appraisal Committee (TAC) under Component 2.

**Component 2: Productive Partnerships.** The specific objective of this component would be to increase the integration of smallholder producers in performing and remunerative value chains, by

developing and implementing productive alliances between smallholders and the private sector in the project areas.

Those partnerships would be demand-driven and consistent with the specific priorities identified in each subsector. During project preparation, these strategic priorities have been identified as follows:

- (a) In the cocoa sector, activities which support CPB management such as training on good farming practices; the production of improved planting material (nurseries and budwood gardens) to increase their availability for replanting; the promotion of and support for rotational replanting and cocoa garden rejuvenation; market-driven diversification of cocoa-farming system; and management of quality through the adoption of more efficient and environmentally-friendly post-harvest and processing technology;
- (b) In the coffee sector, activities which support the adoption of sustainability practices and the expansion of the production of differentiated coffees; training on good farming practices; the production of improved planting material to increase their availability for replanting; replanting and coffee garden rejuvenation programs; market-driven diversification of coffee-farming systems; and management of quality through the adoption of more efficient and environmentally-friendly post-harvest and processing technology.

Project funding would be channeled through partnerships with legal entities in the private and associative sectors, which have already been successfully working with smallholders on productivity, quality and sustainability enhancement and are interested in scaling up those activities. Those partnerships would be result-oriented, and expected results and cost-sharing arrangements would be specified in the partnership agreements. The project would provide assistance for the development of those partnership proposals, as needed, through contracted local service providers.

This component would have two subcomponents:

*Sub-component A: Productive partnerships in the cocoa growing areas.* This component would finance result-oriented partnerships in cocoa-growing areas to increase smallholder cocoa productivity, quality and sustainability and improve cocoa-farming systems. Its implementation would be under the responsibility of the PMU within the Cocoa Board with support from a Technical Appraisal Committee (TAC).

*Sub-component B: Productive partnerships in coffee growing areas.* This sub-component would finance result-oriented partnerships in coffee-growing areas to increase smallholder coffee productivity, quality and sustainability and improve coffee-farming systems. Its implementation would be under the responsibility of the PMU within the CIC with support from the TAC.

**Component 3: Market Access Infrastructure.** The specific objective of this component would be to improve smallholder market access in targeted areas under the project. This component would have two sub-components as follows:

*Sub-component A: Preparation of market access infrastructure investments.* This sub-component would finance the identification and selection of priority investments in support of Component 2 partnerships.

*Sub-component B: Market access infrastructure development.* This sub-component would finance the related investments in infrastructure rehabilitation and maintenance.

## Geographical coverage

The project initially covered East New Britain Province, the Autonomous Region of Bougainville, Eastern Highlands Province, Western Highlands Province, Jiwaka Province and Simbu Province. This will be expanded to other coffee and cocoa growing provinces in the country under the Additional Financing.

### **Targeting**

Targeting of disadvantaged groups would be considered in the selection and prioritization of investments under the project. Additional support will be provided under Component 2 to ensure that groups with lower capacity are able to engage in project activities. Specific consideration will be given to partnerships with smallholder farmers in less favored areas (such as more remote areas in the Highlands, or areas hit by CPB and exclusively dependent on cocoa) and partnerships which mobilize vulnerable groups (such as women and young farmers). Gender balance will be considered in all activities, for example the provision of training to both men and women, or employment opportunities at the ward level through the establishment and management of nurseries and budwood gardens. The M&E system would monitor targeting of those groups under the project.

### **3.0 Description of World Bank Environmental and Social Safeguards Policies and Triggers**

This ESMF has been designed so that all investments in the PPAP comply with all the Environmental Laws of the Independent State of Papua New Guinea and the Environmental and Social Safeguard Policies of the World Bank. In this chapter, the Bank's safeguards policies and their applicability are discussed and in the subsequent chapter those of the PNG are presented.

The World Bank Safeguard Policies that are triggered are:

1. Environmental Assessment (OP4.01)
2. Pest Management (OP 4.09)
3. Indigenous Peoples (OP 4.10)
4. Involuntary Resettlement (OP 4.12)

These policies apply to all activities funded under the PPAP irrespective of whether or not they are being funded in whole or in part by the World Bank, IFAD, Government of Papua New Guinea or any other donor.

The World Bank's official web site [www.worldbank.org](http://www.worldbank.org) lists a complete description of the Bank safeguards and their triggers for applicability.

#### **3.1 Environmental Assessment (OP4.01)**

This policy requires environmental assessment (EA) of projects/programs proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus improve decision making. The EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the program. The EA process takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property) and transboundary and global environmental aspects.

The ESMF establishes a mechanism to determine and assess potential environmental and social impacts during implementation of the subproject activities and investments under the proposed PPAP, and sets out mitigation, monitoring and institutional measures to be taken during the identification and implementation of those activities, to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

OP 4.01 further requires that the ESMF must be disclosed as a separate and stand alone document by the Government of Papua New Guinea and the World Bank. The disclosure should be both in Papua New Guinea where it can be accessed by the general public and at the Infoshop of the World Bank. The draft ESMF was disclosed in country and in the Infoshop of the World Bank on December 8, 2009. The final ESMF was completed on February 15, 2010 and integrates the comments received after public disclosure of the draft.

The Environmental Assessment policy further calls for the PPAP as a whole to be environmentally screened to determine the extent and type of the EA process. The PPAP has thus been screened and assigned an EA Category B. This category of projects/programs is defined as follows:

“Category B projects are likely to have potential adverse environmental impacts on human populations or environmentally important areas - including wetlands, forests, grasslands, and other natural habitats - and are less adverse than those of category A projects. These impacts are site

specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. The EA process for category B projects examines the potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.”

Therefore, this ESMF sets out to establish the process to be undertaken for screening of PPAP activities when they are being identified and implemented. This process requires the implementers/operators/sponsors of the activities in the PPAPs, such as the province, district, the private sector, NGOs, village officials and/or farmer groups and associations to use processes contained in the ESMF, especially Section 5.0, to identify potential adverse impacts of their activities under the project and determine the corresponding mitigation measures they would need to incorporate into their planned activities.

### **3.2 Pest Management (OP 4.09)**

The Bank uses various means to assess pest management in the country and support integrated pest management (IPM) and the safe use of agricultural pesticides: economic and sector work, sectoral or project-specific environmental assessments, participatory IPM assessments, and adjustment or investment projects and components aimed specifically at supporting the adoption and use of IPM.

In Bank-financed agriculture operations, pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties that are resistant or tolerant to the pest. An IPMP is a comprehensive plan, developed when there are significant pest management issues such as (a) new land-use development or changed cultivation practices in an area, (b) significant expansion into new areas, (c) diversification into new crops in agriculture (d) intensification of existing low-technology systems, (e) proposed procurement of relatively hazardous pest control products or methods, or (f) specific environmental or health concerns (e.g. proximity of protected areas or important aquatic resources; worker safety).

An IPMP is also developed when proposed financing of pest control products represents a large component of the project. A pest management plan reflects the policies set out in OP 4.09, Pest Management. The plan is designed to minimize potential adverse impacts on human health and the environment and to advance ecologically based IPM.

As the targeted/significant stakeholders in this program are small block holders, together with the cocoa and coffee industry, who during the implementation cycle of the PPAP, will, independently continue to require the use of inputs, the provisions of OP4.09 are being triggered so that best practice methodologies in this field become part of farmer training activities under the PPAP.

Papua New Guinea does not have a fully developed policy on IPM although the oil palm industry has its IPM. This will be the second initiative to have an IPMP developed in PNG. The GoPNG has prepared an Integrated Pest Management Plan (IPMP), which is included as part of the ESMF and can also be used as a standalone document, to address the needs of OP4.09.

The IPMP has the following objectives:

- To enhance capacity of the program beneficiaries (individual farmers) to be aware of benefits and possible negative impacts of pesticides and to use pesticides in an economic, efficient and safe way for farmers, their families and environment (ensuring that banned pesticides or agro-chemicals under the Stockholm and Rotterdam Conventions will not be acquired by farmers),

- Introduce them to Integrated Pest Management (IPM) approach or concept as the way to control pests and reduce losses and also as the way to increase their production through good farming practices; and
- Identify the current available IPM practices and improve them in the project, with a view to promote movement towards the development and implementation of a pest management policy.

The first part of the IPMP is the presentation of the current policy regulations together with context of the project. It then identifies the main pest problem pertinent to the cocoa and coffee industry. It then outlines the current IPM practices and includes best practices into the PPAP. At this stage, the Cocoa Pod Borer (CPB) is the only active pest that can cause destructive damages to the cocoa industry and the IPMP therefore places a specific emphasis on PB management.

In the case of coffee, the Coffee Cherry Borer (CBB) has not yet arrived into Papua New Guinea, hence the approach is to do surveillance and raise awareness of the coffee farmers and ensure that all stakeholders are prepared for possible incursion. A contingency plan has been prepared by GoPNG with support from ACIAR. The use of agrochemicals is not properly regulated in PNG and that is also covered in the IPMP.

### **3.3 Indigenous Peoples (OP/BP 4.10)**

This policy has two objectives: A) To ensure that indigenous people benefit from development projects, and B) to avoid or mitigate potential adverse effects on indigenous people caused by Bank – financed activities. Special action is required where Bank investments affect indigenous peoples, tribes, ethnic minorities, or other groups whose social and economic situation restricts their capacity to assert their interests and rights in land and other productive resources.

The PPAP triggers OP/BP 4.10 on Indigenous Peoples. However, as all beneficiaries of the project and all people affected by the project are indigenous, no separate Indigenous Peoples Policy (IPP) will be required. The key elements of an IPP have been integrated in the project design. In order to ensure compliance with the requirement of free and prior informed consultation and to achieve broad community support for the project activities, the Beneficiaries Participation Framework and the Consultation Guidelines and the Consultation Frameworks developed during the implementation of original financing have been consolidated into a Community Consultation and Participation Guidelines.

The social surveys carried out under the Social Assessment and the community consultations carried out as part of the EA indicated strong community's support for both the cocoa and coffee interventions. The project will however ensure the specific characteristics and vulnerabilities of groups targeted by the sub projects will be considered.

### **3.4 Involuntary Resettlement (OP/BP 4.12)**

The project will not finance any activity that requires involuntary resettlement or involuntary land acquisition.

Under Component 2 (Productive Partnerships), any activity requiring land use, such as rehabilitation and expansion of existing nurseries, the establishment of satellite nurseries and budwood gardens, and the improvement of processing and storage facilities will be voluntary in nature and will take place within existing facilities. The Project Implementation Manual details the process for due diligence that will be required as a prerequisite for approval of these sub-projects.

Under Component 3 (Market Access Infrastructure) subprojects may possibly result in temporary land use, or damage of crops and economic trees.

A Compensation Policy Framework (CPF) has been prepared which details the key principles for land use and compensation for damaged assets should such situation arise. These principles include:

- i) Consultations with and support from communities as a first step in subproject preparation;
- ii) Minimize land acquisition and damage to assets through appropriate design of infrastructure rehabilitation works; no financing for subprojects that require voluntary or involuntary resettlement or damage to physical assets;
- iii) The provision of minor land acquisition through voluntary donations only.

**Table 1: Summary of the Requirement of Bank Safeguard Policies triggered by the PPAP**

<b>Bank Safeguards Policy Triggered</b>	<b>Action Required by Triggered Policy</b>	<b>By Whom</b>	<b>Date action required by</b>
OP4.01 Environmental Assessment (including Pest Management OP 4.09)	1) Preparation of ESMF and IPMP (this document)  2) Under Component 2, Preparation of subproject EMPs (see section 5.0)  3) Under Component 3, preparation of an EMP for specific infrastructure rehabilitation	1) ESMF, including IPMP, by GoPNG  2) Sub project EMPs by subproject applicants; Screening and monitoring by PMUs  3) Senior Engineer with support from Environmental Specialist	1) ESMF to be approved by the DAL of the GoPNG and the World Bank and disclosed in PNG and in Bank Infoshop.  2) Subproject EMP's to be approved by the PMUs before funding released for activities.  3) Investments to be approved by the PMU and maintenance commitment of Provincial administration
OP/BP 4.10 Indigenous People	Elements of IPP to be included into Project Design.	GoPNG	Elements of IPP effectively implemented under PPAP
OP 4.12 Involuntary Resettlement	Preparation of CPF	GoPNG	CPF to be approved by DAL and by the Bank and disclosed in PNG and Bank Infoshop.

## **4.0 Administrative, Policy, Legislative and Regulatory Framework**

### **4.1 Administrative Structure and PPAP institutional arrangements**

The Independent State of Papua New Guinea is made up of mainland Papua New Guinea and the island of New Britain, New Ireland, Bougainville and the 600 smaller islands stretched out in the Bismarck, Solomon and Coral Sea. Administratively, PNG is divided into 20 provinces with the 81 Districts, corresponding Local Level Governments and Wards and villages. The village is the smallest administrative area and the one closest to the communities.

The role of Government for the agricultural sector is to facilitate development, provide stimulus for private investment initiatives, and promote effective regulation, monitoring and co-ordination of the sector. The agricultural sector lead Ministry, and department, namely the Department of Agriculture and Livestock (DAL) will coordinate the implementation of the PPAP at national level and Project Management Units (PMU) located respectively in the PNG Cocoa Board and in the PNG Coffee Industry Corporation Ltd (CIC) will be responsible for project implementation in the project provinces.

Overall policy guidance and coordination of the PPAP will be provided through the national Project Steering Committee (PSC). The PSC, chaired by the Secretary of DAL, is responsible for overseeing the implementation of the PPAP and monitoring its performance to ensure that the goals of the project are being achieved. The PSC, which meets at least six-monthly, comprises representatives from the Department of Finance (DOF), the Department of Treasury (DOT), the Department of Works (DOW), the Department of Environment and Conservation (DEC), the Department of Commerce and Industry, the Cocoa Board (CB), the Coffee Industry Corporation Ltd (CIC), the Rural Industries Council (RIC), the National Agriculture Research Institute (NARI) and the Provincial Governments of the project provinces.

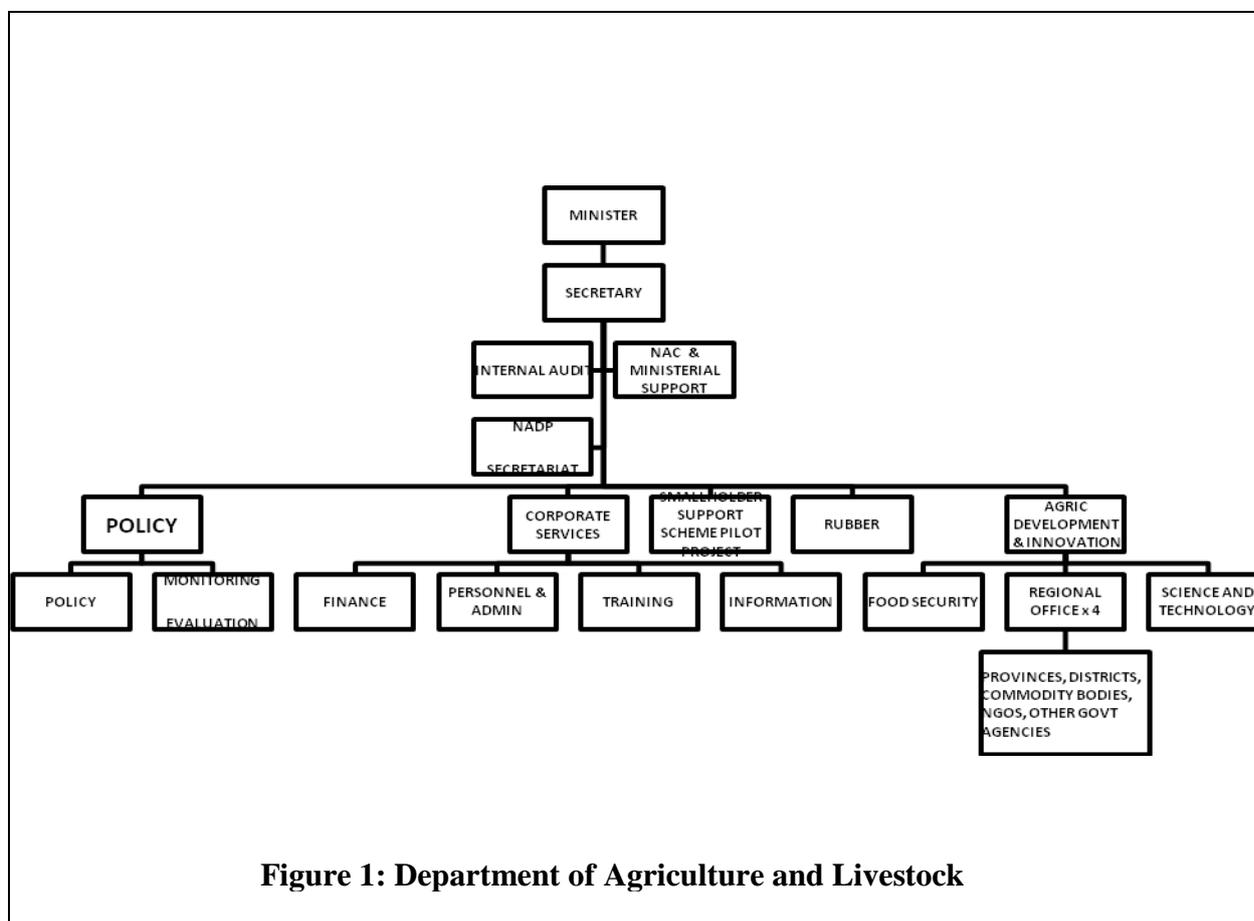
### **4.2 Management and Administration Framework for Agriculture and Rural Development**

With regards to the management and administration of agriculture projects and activities throughout Papua New Guinea, the overall responsibility lies with the Department of Agriculture and Livestock, and for the management of the bio physical environment, the responsibility rests with the Department of Environment and Conservation although there are other sector departments and agencies that have specific obligations to natural resources such as;

- Department of Mining and Geohazards.
- Mineral Resources Authority.
- Department of Petroleum and Energy.
- Department of Lands and Physical Planning.
- National Forestry Authority.
- National Fisheries Authority.
- Department of Works.
- Department of Commerce and Industry.

For specific commodities, management and administration has also been delegated to the respective commodity boards, such as the Cocoa Board and the CIC. Finally, under the Organic Law, the delivery of extension services has been devolved to the provincial and district level.

Agriculture in PNG is coordinated by the Department of Agriculture and Livestock, where the Department of Agriculture and Livestock has an overarching responsibility over a number of agencies and research institutions such as the National Agriculture Research Institute (NARI), National Agriculture Quarantine Inspection Agency (NAQIA), the Coffee Industry Corporation (CIC), the Cocoa Coconut Institute Limited (CCIL) and the Cocoa Board (CB). Figure 1 shows the current structure of DAL.



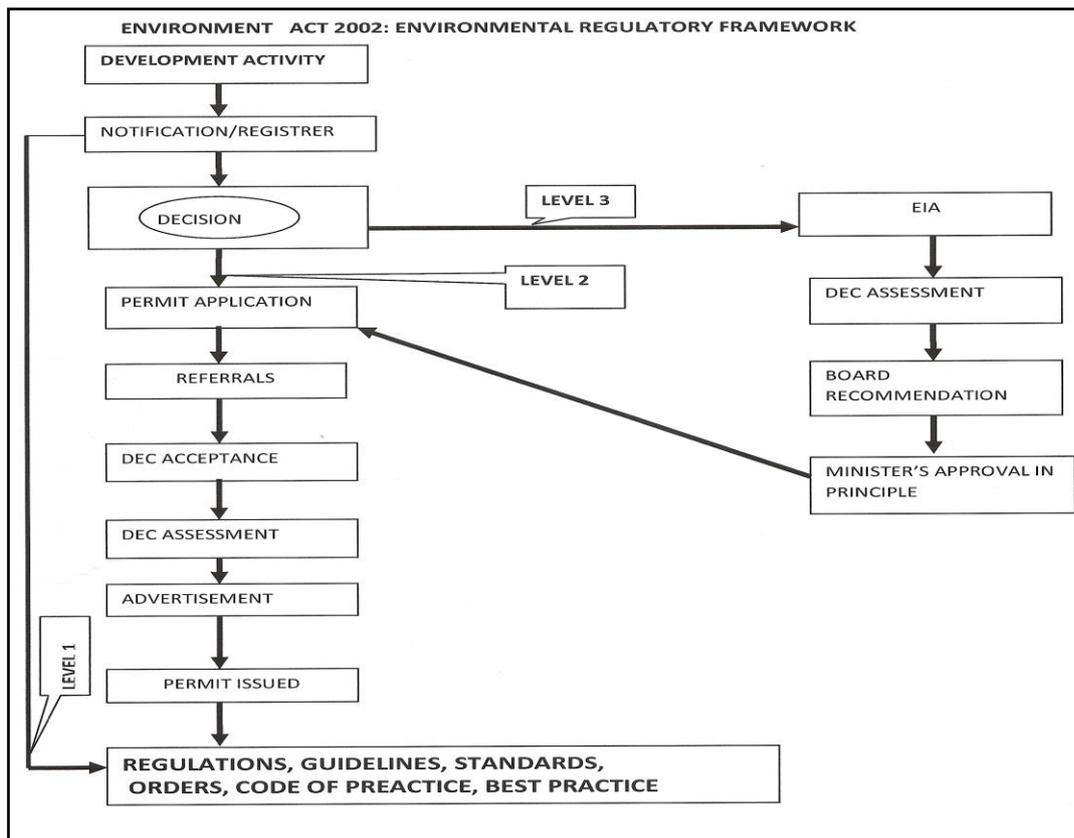
Within the PPAP, the commodity boards responsible for project management are the CIC and Cocoa Board.

The National Agriculture Development Plan (NADP), approved in 2007 and covering the 10 year period to 2016, is the framework document guiding Government's support to the agriculture sector. At sector level, strategic plans have also been developed more recently, such as the Coffee Strategic Plan 2008-2018 of the CIC, and the cocoa strategic plan being prepared by the Cocoa Board.

Environment protection and conservation, as well as sustainable natural resource management, are key principles under the NADP.

### 4.3 The EIA Process in Papua New Guinea

The EIA process in Papua New Guinea is shown by Figure 2 and it sets out the process in relation to the Environmental Act 2000 and the Environmental Regulatory Framework (ERF) as outlined by DEC 1996.



**Figure 2: EIA Process in PNG**

Provided in the ERF document are the prescribed activities within different Levels to determine whether an activity will require either a full EIA or be subjected to regulations, guidelines, standards, orders, code of practice and best practice. Level 1 is deemed to have insignificant impact and would be subject to regulations. While Level 2 and 3 has significant impact and will be subjected to the EIA process.

The EIA procedure involves the following:

- \* **Registering a development activity:** The proponent is required to register the activity or project with the DEC.
- \* **Screening and Decision Making:** The project is classified to determine the level at which the environmental assessment should be carried out. If the project does not have any significant impact on the environment then the activity will be approved and subject to the guidelines, regulations, standards or code of best practice. If the project falls into Level 2 or Level 3 then the EIA process will continue.
- \* **Conducting an EIA:** This involves the three main stages of the EIA process (scoping, preparing terms of reference and preparing a Notification of Preparatory Work). By submitting a notification of the preparatory work, projects can be further screened and then decisions made. Level 2 activities will be assessed and then approval through an appropriate Permit. For Level 3, a full EIA will need to be conducted.

A number of documents are submitted to DEC for the Level 3 project with firstly an Environmental Inception Report. This is assessed and feedbacks made to the proponent to adjust or expand on the EIA process. This is then followed through with the full project EIA. Guidelines for the Environmental Inception Report and the Environmental Impact Statement (EIS) are provided by DEC.

\* **Reviewing the EIA:** An Environment Council established by the DEC reviews the EIA and decides whether the EIA is acceptable or not.

\* **Issuing the relevant permits:** If the EIS is approved, the DEC issues the necessary environmental permit that confirms the EIS has been satisfactorily completed and the project may proceed.

\* **Decision-making:** A decision is made as to whether a proposal is approved or not; a record of decision explains how environmental issues were taken into consideration.

\* **Monitoring project implementation:** The operator prepares and executes an appropriate monitoring program (i.e. an environmental management program).

**Monitoring the project:** DEC undertakes periodic and independent compliance monitoring of the project. It will provide a report which will be given back to the developer for discussions and amendment to its operation, should there be an environmental concern.

\* **Decommissioning the project upon its completion:** A decommissioning report is prepared at the end of the project life. This report outlines the restoration/rehabilitation activities to be carried out by the operator and is lodged with the DEC. At the moment in PNG, only mines have followed the process of decommissioning completed projects. In the other sectors, reporting has not been consistent.

**Extent of public participation.** Public consultation and participation is required during the scoping stages and while fulfilling the terms of reference for the impact assessment of the EIA process. The operator is responsible for identifying interested and affected parties and ensuring that all parties concerned are given adequate opportunity to participate in the process. A public information program is initiated, and public notices are issued during the scoping and EIA stages.

Whenever a strong public concern over the proposed project is indicated and impacts are extensive and far-reaching, DEC is required to organize a public hearing. The results of the public hearing should be taken into account when a decision is taken whether or not a permit is to be issued.

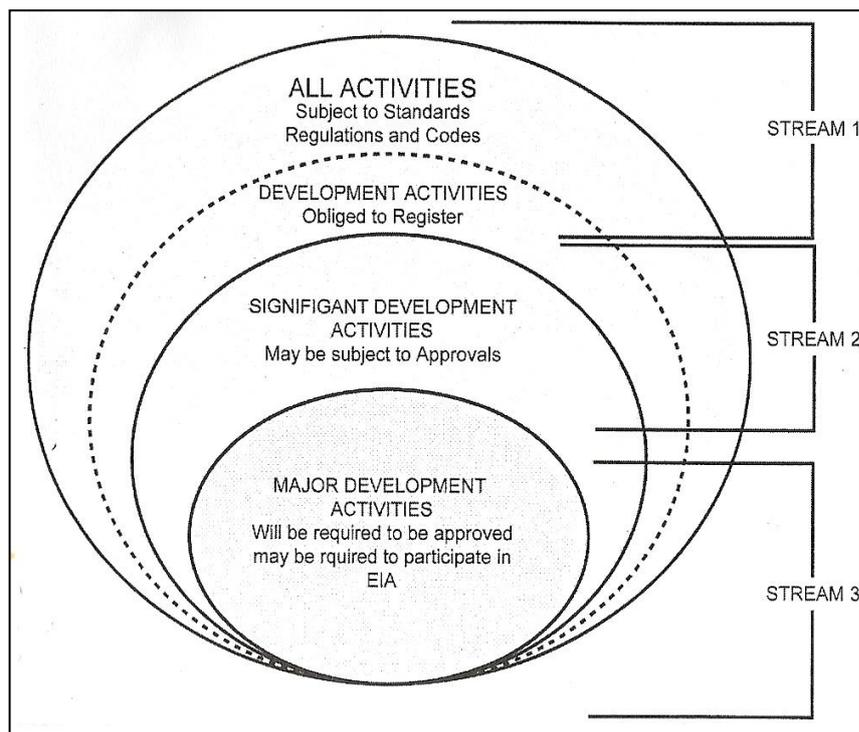
#### 4.4 Legislative Framework for the Management of the Environment

The Papua New Guinea Department of Environment and Conservation (DEC) is the national agency tasked with environmental management within Papua New Guinea. It has undergone a regulatory reform process in line with other public sector reforms and institutional structure for environmental management has changed. DEC had key strategic directions opting to move away from a central management to a national, provincial and community oriented management system (DEC, 1996).

In 2002, the Environmental Act 2000 was enacted where environmental assessment requirements for activities and projects in Papua New Guinea incorporated the previous three Acts; Environmental Planning Act (1978), Environmental Contaminants Act 1982 And Water Resources Act 1982. The Environmental Contaminants Act contains procedures and permitting of pesticides and these are now incorporated into the Environmental Act 2000.

As earlier stated, activities are screened into three streams (Figure 2) where Level 1 or Stream 1 activities could be subjected to standards, regulations and codes. The new Environment Act provides for a regulatory framework for environment management which also covers management of chemicals and hazardous substances. The Act specifies three levels of Activities which is a categorization of the degree and magnitude of environmental impacts. Levels of impacts are categorized into three groups and illustrated in Figure 3.

**Figure 3: Regulatory Streams under the Environmental Act 2000 (DEC 1996)**



**Level 1 activities:**

are those that require a minimum level of environmental protection. Regulation of such activities will be based on standards, codes and regulations that set benchmarks for environmentally acceptable activities. For example, maximum discharge levels, ambient quality standards for receiving environment, codes of practice, guidelines for best/acceptable practice.

In cases of non-compliance, environmental protection orders, clean-up orders and emergency directions may be issued.

**Level 2 activities:**

are those that require a framework of environmental approvals allowing for water discharge permits, or licensing for importation, sale and use of environmental contaminants (hazardous chemicals) and for site-specific environmental conditions to be set for these activities which have more significant potential impacts. Level two activities will be regulated by means of conditions in environmental permits, environmental improvement plans and environmental management programs.

**Level 3 activities:**

cover those with the potential of major environmental impact and are projects of national significance or of large scale. Such activities will be subject to a process of public and detailed considerations of environmental implication through the Environmental Impact Assessment process.

Activities of the Productive Partnerships in Agriculture Project (**PPAP**) all fall under Level 1 and Level 2 and is consistent with the World Bank Category 'B' project.

Level 2 activities are stated in the following sub categories 2, 8, 9 & 12 of the Environmental Act 2000 respectively.

- 2.3 Gravel extraction operating continuously for more than 6 months and involves the extraction of no greater than 10,000 tonnes per annum.
- 2.4 Quarrying involving the extraction of no greater than 100,000 tonnes per annum.
- 8.5 Agricultural cultivation of an area greater than 1,000 hectares.  
Sub category 9: Food processing and plant product processing.
- 9.4 Processing of coffee or cocoa in plants producing more than 5,000 tonnes per year
- 12.2 Construction of marinas and boating facilities designed or used to provide mooring for more than 50 powered vessels at any one time

#### 4.5 International Conventions

Papua New Guinea is a party to many international agreements including on Biodiversity, Climate Change, Desertification, Endangered Species, Ozone layer protection, and Marine Life Conservation. Within the context of the PPAP, only the following are applicable as discussed in the Environmental Assessment (EA).

- i. International Plant Protection Convention;
- ii. Convention on Biological Diversity;
- iii. Rotterdam Convention as the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International/ Trade; and
- iv. Stockholm Convention on Persistent Organic Pollutants.

### 5.0 Environmental and Social Guidance on Preparation and Screening of Subproject Proposals

#### 5.1 Introduction

This section of the ESMF can be used both for guidance of applicants under Component 2 of the PPAP in the preparation of their subproject proposals and for the evaluation of the proposals by the PCU and the PMUs to ensure that subprojects and activities implemented under Component 2 have no deleterious environmental or social impacts. It will also be used by the PMU for the selection and implementation of specific investments under Component 3.

The Environmental and Social Risk Matrix (Table 2) serves to identify potential environmental or social effects of sub projects so that these can be avoided or mitigated in the project design. Table 3 provides a screening process with regular “flagging” of situations that require amendment of subproject/activity design to minimize deleterious environmental and social effects of the activities contained in the final project proposal.

Both tables can be used in by the PMUs in subproject appraisal under Component 2 and for the screening of specific investments under Component 3.

#### 5.2 Risk assessment

**Table 2: Environmental and Social Risk Matrix**

Proposed Development Activity:			Proponent:	
Natural Resource	Resource	Environmental	Avoidance or	Resources Allocated

	Value	Effect or Potential Risk			Mitigation Measures	Tasks to be carried out
		Low	Med	High		
Social Structures / Social Relationships	Social Values	Social Effects or Potential Social Risks			Avoidance or Mitigation Measures	Resources Allocated / Tasks to be carried out
		Low	Med	High		

### 5.3 Environmental and Social Screening

The screening would ensure that issues are addressed early in the preparation process and that proposals for Component 2 and Component 3 that do not and could not meet the requirements are not allowed to proceed. The following are important considerations in the screening of proposals.

**Natural Habitats.** The project interventions would focus on the improvement of smallholder production and small scale market access infrastructure in existing production areas. Hence, impacts on natural habitats or protected areas are highly unlikely. To provide added safeguard against potential impacts to natural habitat, all subprojects or activities which could potentially have adverse impacts on critical natural habitats (as defined by World Banks OP4.04) will be screened out from the eligible activities. The Department of Environment and Conservation will be consulted by the PMUs and PCU at the start of project implementation, and as needed for updates, to ensure that the most current information on natural habitats, including conservation areas and other sensitive environments in the project areas, is provided to the PMUs/PCU.

**Forests.** Similarly, the project will not finance any activity involving significant conversion or degradation of critical forest areas or related critical natural habitats. The Department of Forests will be consulted by the PMUs and PCU at the start of project implementation, and as needed for updates, to ensure that the most current information on forest inventories and forest status in the project areas is provided to the PMUs/PCU.

**Physical cultural resources.** Subprojects and activities under the PPAP are unlikely to affect sites with archeological, paleontological, historical, religious, or unique natural values, because they will be carried out in existing production areas. However, appropriate clauses will be included in construction contracts under Component 3 regarding the procedures to be followed in the event of “chance finds” of culturally significant artifacts or sites.

Simple Environmental and Social Screening Forms have been developed for use in the Additional Financing (Appendix 1).

## 55.5 Timing and responsibilities

Below is a summary of the process and requirements to be applied respectively under Component 2 and Component 3, as well as the responsibilities of the different parties in the screening of proposals.

**Table 3. Environmental and social safeguards preparation, review, approval and monitoring process and requirements for productive partnership proposals**

Stage	Safeguards Review Process and Documentary Requirements
1. Identification (Submission by Applicant of Initial 2-page Proposals)	The PMU Component 2 Coordinator with support from Environment Specialist identifies any potential environmental or social issue and advise qualified Applicants to address them in their full proposals
2. Preparation of Full Proposal Package	<p>Applicants to:</p> <ul style="list-style-type: none"> <li>• Undertake informed consultation and secure broad community support to the proposal following the guidelines in the IPPF;</li> <li>• Conduct quick environmental and social scanning/assessment of the proposed partnership communities with particular focus on gender issues, malnutrition and family food security, illiteracy/numeracy, alcoholism and HIV/AIDS;</li> <li>• Undertake complete screening of planned activities using the Environmental and Social Screen Form (ESSF);</li> <li>• Prepare Environmental and Social Management Plan (ESMP) based on the result of the assessment and screening; and,</li> <li>• Further develop the Partnership proposal to incorporate measures identified in the ESMP.</li> </ul> <p>Applicants to prepare/secure the following safeguard documents and submit as part of the full proposal package:</p> <ul style="list-style-type: none"> <li>• Evidences of prior consultation and broad community support</li> <li>• Completed ESSF</li> <li>• ESMP following the Template</li> <li>• Other documents such as required such as Voluntary Land Use Agreements</li> </ul>
3. Review of Proposals	PMU Component 2 Coordinator with support from Environment Specialist as needed, to review the safeguards aspect of the proposal package focusing on the following documents: Completed ESSF; ESMP; Evidences of Prior Consultation Conducted and Broad Community Support; Program of Activities; Voluntary Land Use Agreements (if required); and the Partnerships proposed Program of Activities. The PMU will also conduct field validation of these documents. Based on the review, the PMU may require further refinements to the proposal or clear it for TAC appraisal.
3. Appraisal	The Technical Appraisal Committee (TAC) reviews the proposals and ranks them using a Score Sheet and endorses selected proposals for ICC approval or rejection.
4. Approval/Rejection	The Industry Coordinating Committee (ICC) formally confirms approval or rejection of proposals and Applicants are advised accordingly.
5. Implementation and Monitoring	The Lead Partners and the Farmers undertake the ESMP measures as part of the Partnership Program of Activities. The PMU M&E Specialist monitors compliance of ESMP.

**Table 4. Environmental and Social Safeguards preparation, review, approval and monitoring process and documentary requirements for Market Access Infrastructures**

Stage	Process and Documentary Requirements
Investment Identification	PMU Senior Engineer with support from the Environment Specialist and Community Liaison Officer conducts initial screening as part of field assessment; and, initial consultation with communities and other stakeholders; documents the consultation process following the IPPF.
Eligibility Screening	PMU Senior Engineer conducts eligibility screening and full environmental and social screening using the ESSF and determines the requirements that would apply such as: ESMP; Evidence of FPIC and BCS; Land/Road Right of Way Acquisition Documents; Compensation Agreements/Plan; Feasibility Study/Project Description and Detailed Engineering incorporating ESMP measures; and GoPNG Requirements (i.e. whether an EIA is required; The PMU may register the infrastructure proposal with DEC for screening under the ERF).
Preparation of Proposal Package and Documentary Requirements	<p>PMU Infrastructure team:</p> <ul style="list-style-type: none"> <li>• Prepares/secures the safeguard documents as determined during the screening;</li> <li>• If the infrastructure activity falls within Level 2 or 3, the PMU shall cause the conduct of EIA and preparation of the EIS according to the PNG EIA process. Otherwise, the PMU will conduct a quick environmental and social assessment/scanning of the site and influence area of the proposed infrastructure and based on the assessment, prepares the ESMP following the ESMP template for infrastructure;</li> <li>• The PMU shall further develop the Project Description/Feasibility Study, Detailed Engineering or Program of Work based on the results of the EIS or the ESMP;</li> <li>• Land use agreements for temporary access and/or compensation plans for affected crops and assets, if required, should be pursued following the LARPF.</li> <li>• Further consultations with the communities and other stakeholder should be undertaken during the project preparation following the IPPF.</li> </ul>
Full Review of Proposal Package	PMU Infrastructure team supported by the Environmental Specialist checks for completeness of safeguard requirements and evaluates the safeguard aspects of the proposal package. If found compliant and sound, the team clears the proposal for endorsement by the PMU to the Industry Coordinating Committee (ICC).
Approval by ICC	ICC acts on the recommendations of the PMU
Final Consultation with Stakeholders	PMU Senior Engineer and Community Liaison Officer conduct further consultation with stakeholders and facilitate the signing of Memorandum of Understanding (MOU) on road maintenance with the concerned LLG and beneficiary communities.
Detailed Engineering Design and preparation of Bidding Documents	PMU Infrastructure team to ensure that ESMP measures are considered in the detailed engineering design or incorporated in the Program of Works.
Procurement and Bidding	PMU Infrastructure team to ensure that standard clauses as per section 6.0 of this ESMF as well as the relevant measures in the ESMP are integrated in bidding documents
Construction and Compliance Monitoring	PMU ensures that ESMP measures are undertaken as part of the infrastructure program of works. The M&E Specialist conducts periodic compliance monitoring on the ESMP during construction.

Operations and Maintenance	ESMP measures that are part of the maintenance program, if any, are undertaken.
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## 6.0 Environmental Management Plan Guidelines

This section sets out the type of activities proposed under the PPAP, examines the potential environmental impacts and recommends the appropriate mitigation measures that need to be in place to minimize deleterious impacts and provides indicators for environmental monitoring. It builds on the findings of the Environmental Assessment.

### 6.1 Potential subprojects under the PPAP

Table 4 presents the descriptions of typical activities under the subprojects in the PPAP. These are not exhaustive but expected to be the most common activities under the project.

**Table 3: Description of potential subprojects in the PPAP**

<b>Component 2: Productive Partnerships</b>	
<b>Cocoa sector</b>	<b>Details</b>
a) Management activities supporting Cocoa Pod Borer (CPB) control including training on good farming systems.	Activities involve the training of cocoa farmers on aspects of IPM that will manage CPB within cocoa blocks. IPM requirement.
b) Provision of improved planting material (nurseries and budwood gardens) supplied to farmers to replace old/ affected trees.	Nurseries will supply cocoa seedlings to replace CPB affected trees within project provinces.
c) Promotion and support for rotational planting and cocoa garden rejuvenation and market driven diversification of cocoa farming system	The provision of tools, planting material and training to improve cocoa gardens , harvesting and the rehabilitation of old cocoa trees.
d) Adoption of quality of cocoa through the post harvest and processing technologies.	Improvement in the delivery of smoke free and air dried cocoa to meet high quality of cocoa through the replacement of faulty kiln pipes in cocoa fermenteries and the safe disposal of cocoa sludge from sweating.
<b>Coffee sector</b>	
a) The supported expansion of differentiated coffees such as organically grown and certified, Fair Trade and others and these support sustainability practices.	Activities involve more farmer groups to join up with a differentiated coffee practice within a particular area, e.g. Fair Trade and entails training and assistance.
b) Improvement in training of good farming practices and also the threat of the Coffee Berry Borer (CBB).	Similar to above activity, with more focus on individuals who are outside of the certification to ensure coffee pulp is returned under the coffee tree and the maintenance of shade for the reduction of weeds. CBB has not arrived in PNG as yet however awareness of the threat and the need for surveillance need to be given to the majority of coffee farmers through cooperative groups and other stakeholders.
c) Production of improved planting material for replanting and coffee garden rejuvenation and market driven diversification of coffee farming systems.	Nurseries to provide improved coffee seedlings and hybrids to replace over grown coffee with the opportunity to produce better output.
d) Adoption of quality of coffee through the post harvest and processing technologies.	Need for waste water management to ensure receiving water quality is maintained. Also is the provision of grants to factories to adopt low environmental impact technologies.

<b>Component 3: Market Access Infrastructure</b>	
a) Upgrading of feeder roads in project area	Rehabilitation and upgrading of existing roads and river crossings to an all-weather standard to improve market access.
b) Upgrading of paths, wharves and jetties allowing the transportations of coffee and cocoa to be delivered to marketing or processing points.	Cocoa delivered from ARB requires potential areas where ships may service these wharfs and jetties and connecting tracks would need to be upgraded. The level of jetties will need to be assessed to determine the necessary capacity and load to ensure containment of the cocoa bags.

## 6.2 Recommended Mitigation and Monitoring Measures

Tables 5-7 provide details on requirements to be included in individual Environmental Management Plans. These tables have been prepared so that the information appears in a logical and straightforward fashion that should make it easy to understand and use. For each of the mitigation measures presented, a method of implementation is proposed. Timing is extremely important with respect to effective implementation because some of the recommendations involve additional cost and can affect the subproject budget. The recommended methods of implementation include the following:

- **As a design guideline or recommendation**

The mitigation measures should be included in the initial design of the subproject/activities. Often, on road maintenance projects where anticipated environmental impacts are minimal, effective mitigation is simply a matter of ensuring that the roads are designed properly to control negative effects. The same applies for activities under Component 2. In general, if the design is properly done (as should be the case on this project), there will be NO IMPACTS at all. In a few cases, slight changes to design will eliminate the potential for impacts. In the case of civil works, of particular concern in the design stage is the location of material sources. These should be clearly identified and located on maps in order to ensure that no problems ensue once construction starts.

- **As a suggested clause in contracts, memorandum of understanding and agreements**

There should be a clause in the works contract document (or partnership agreement under component 2) referring to particular mitigation measures to be applied. There are a number of ways of addressing this. A common method is to simply refer, in the contract, to the Environmental Management Guidelines in existence, detailing any specific aspects not already in the guidelines. However, this assumes that all parties are familiar with and understand how to implement these guidelines, which is not always the case. Therefore providing specific clauses in the contract/agreement detailing measures and actions required on the part of the contractor/operator/partner is the recommended approach.

- **For civil works, inclusion in the Bill of Quantities (and usually also in the contract)**

Recommended mitigation measure should be included as an item in the Bill of Quantities. This will ensure that the item has been budgeted for and will be implemented as required. There are two approaches to deal with the incorporation of environmental management costs into the bids prepared. One is to request that the contractors include these costs in their rates. Although this works well in some instances, in many cases the contractors, in remaining competitive, will not adequately reflect the real cost of environmental mitigation in their bids. The second approach, recommended above, presents the mitigation measure as a line item in the Bill of Quantities. There would be an identified extra payment in the contract to ensure that the work is carried out by the contractor as specified. An example of clauses that could be included in the Bill of Quantities is as follows:

- the definition of exactly how many cubic metres of spoil and excess material must be disposed of

- a definition of how many hectares in total of replanting or revegetation must be undertaken and cost per hectare (or m<sup>2</sup>)
- cost of recommended erosion control structures (if over and above those that would normally be constructed as part of normal engineering design)

In order to achieve this in practice, it is recommended that the draft contract formats be reviewed by an Environment Specialist to ensure that the appropriate clauses have been incorporated. This could be undertaken by the PPAP Environmental Specialist.

As for the coffee and cocoa industry, appropriate mitigation measures will need to be overseen by the Component 2 Coordinator with guidance from the Environmental Specialist.

**Table 4: Proposed Mitigation and Monitoring Measures for Coffee and Cocoa**

<b>Sub project level impact Coffee</b>	<b>Proposed Mitigation Measures</b>	<b>Monitoring Measures and applicable indicator</b>	<b>Costings</b>
Nursery establishment, bush clearance; disturbance to habitats; Chemical alteration of ecosystems by application of fertiliser, pesticides or herbicides. Fertilizer/Pesticide/ Herbicides Run off cause changes in the ecosystem and population of organisms.	<ul style="list-style-type: none"> <li>• Ensure there is minimal clearing of vegetation for nursery sites. All mitigation measures here to be implemented by nursery staff.</li> <li>• Ensure nurseries are sited away from water ways or creeks.</li> <li>• Have fertilizer and herbicides applied individually with its correct dosage and frequency.</li> <li>• Ensure all fertilizers, pesticides and herbicides are stored in a closed area under a dry roof.</li> </ul>	<ul style="list-style-type: none"> <li>• All activities to be monitored by C2 coordinator in PMU in EHP through the Coffee Industry Coordinating Committee (Coffee ICC) and overseen by the Environmental Specialist (ES).</li> </ul> <p style="text-align: center;"><b>Indicators</b></p> <ul style="list-style-type: none"> <li>• Observation of nurseries away from creeks</li> <li>• Good farm practices</li> <li>• Fertilisers, pesticides and herbicides stored in secure location</li> </ul>	Costs as part of the operations of the Component 2 (C2) Coordinator and ES.
Rehabilitations of coffee plots with the clearing of overgrown coffee trees and the planting of improved coffee farming system; slight alteration of ecosystems.	<ul style="list-style-type: none"> <li>• Removal of aging coffee trees to be replaced by new seedlings together with filling gaps in coffee gardens.</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly monitoring visits to selected farmer groups or cooperative's areas to establish this practice.</li> </ul> <p style="text-align: center;"><b>Indicators</b></p> <ul style="list-style-type: none"> <li>• Good house keeping of storage</li> </ul>	Costs as part of the C2 coordinator quarterly visits
Waste generated from coffee pulp and waste water, impact on the terrestrial and aquatic environment  Smoke from burning of coffee bean skins. Source of air pollution.	<ul style="list-style-type: none"> <li>• Ensure coffee pulp is placed back under coffee trees or in food gardens to allow natural decomposition.</li> <li>• Coffee waste water to be kept in anaerobic ponds to allow oxidation and reduction of Biological Oxygen Demand (BOD) and Chemical Oxidation Demand (COD) to meet PNG Water Quality Standards before being discharged into the receiving waterways and rivers.</li> <li>• Mitigation measures to be implemented by wet factories</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly monitoring visits to selected wet processors/ coffee factories to establish this practice.</li> </ul> <p style="text-align: center;"><b>Indicators</b></p> <ul style="list-style-type: none"> <li>• Waste water pond adequate and BOD low at discharge point</li> <li>• If received grant, determine if recycling is working and receiving water minimal into water ways</li> </ul>	Similar comments as above
Significant water demand for processing of coffee beans	<ul style="list-style-type: none"> <li>• Estimate incremental demand of water.</li> <li>• Confirm availability from sustainable sources.</li> </ul>	<ul style="list-style-type: none"> <li>• Peak water demand in processing plants.</li> <li>• Riparian flows.</li> </ul>	Similar comments as above.

	<ul style="list-style-type: none"> <li>• Determine Riparian flows.</li> <li>• Consult downstream users if water use will result in reduced flows affecting them.</li> <li>• Maintain riparian flows in dry season/or other times of peak demand.</li> </ul>		
<b>Cocoa sector</b>			
<p>Nursery establishment, bush clearance; disturbance to habitats; Chemical alteration of ecosystems by application of fertiliser, pesticides or herbicides. Fertiliser/Pesticide/ herbicides Run off cause changes in the ecosystem and population of organisms.</p>	<ul style="list-style-type: none"> <li>• Ensure there is minimal clearing of vegetation for nursery sites. All mitigation measures here to be implemented by nursery staff.</li> <li>• Ensure nurseries are sited away from water ways or creeks.</li> <li>• Have fertiliser and herbicides applied individually with its correct dosage and frequency.</li> <li>• Ensure all fertilisers, pesticides and herbicides are stored in a closed area under a dry roof.</li> </ul>	<ul style="list-style-type: none"> <li>• All activities to be monitored by PMU in ENB through the C2 coordinator and overseen by the Environmental Specialist (ES) during visits.</li> </ul> <p><b>Indicators</b></p> <ul style="list-style-type: none"> <li>• Observation of nurseries away from creeks</li> <li>• Good farm practices</li> <li>• Fertilisers, pesticides and herbicides stored in secure location</li> </ul>	Costs as part of the commitment of the C2 coordinator and ES's visits.
<p>Replacing CPB affected trees Destroying host insects habitats.</p>	<ul style="list-style-type: none"> <li>• Cutting of old cocoa trees to be heaped in an area where these can dried out and used as fuel wood for fermentery. Mitigation measures here by individual block holders</li> <li>• Loping of cocoa trees to be in line with IPM height recommendations of 3 metres.</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly monitoring visits to selected farmer groups or cooperative's areas to establish this practice.</li> </ul> <p><b>Indicators</b></p> <ul style="list-style-type: none"> <li>• Good house keeping of storage</li> </ul>	Similar comments as above
<p>Waste generated from cocoa pods and sludge, potential impact on the terrestrial environment  Smoke from fermentery onto cocoa beans, a nuisance for the maintenance of cocoa quality.</p>	<ul style="list-style-type: none"> <li>• Ensure waste generated from the cocoa "sweating" process is placed under cocoa trees or in food gardens to allow natural decomposition. No use for this in PNG at the moment, although some have stated it to be used for liquor. Mitigation measures to be implemented by individual farmers and overseen by PMU.</li> <li>• To ensure flue pipes are replaced to ensure smoke does not taint cocoa</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly monitoring visits to selected farmer groups areas and also industry partners to observe practices.</li> </ul> <p><b>Indicators</b></p> <ul style="list-style-type: none"> <li>• Clear disposal of sludge under gardens</li> <li>• Creek to be clear of sludge</li> <li>• Cocoa beans are free from smoke taint</li> </ul>	Similar comments as above

	beans.		
Use of firewood for cocoa drying could be an issue in some areas	<ul style="list-style-type: none"><li>Promote efficient driers and combined/solar driers under the project</li></ul>	<ul style="list-style-type: none"><li>Monitoring by Component 2 Coordinator; specific emphasis on clean technologies in call for proposals</li></ul> <b>Indicators</b> <ul style="list-style-type: none"><li>Number of improved driers</li></ul>	Similar comments as above

**Table 5: Proposed Mitigation and Monitoring Measures for Feeder Roads and Paths**

Sub project level impact Component 3	Proposed Mitigation Measures	Monitoring Measures and applicable indicator	Costings
<p><b>Clearing of the right- of-way (ROW) and Social Issues</b></p> <ul style="list-style-type: none"> <li>• Dissatisfaction on the part of potential persons that may have fruit trees or other structures on current ROW.</li> <li>• Disturbances from construction activities,</li> <li>• Safety problems</li> <li>• Areas of historical or archaeological significance could be discovered and affected (chance finds)</li> </ul>	<p>Obtain broad community consent as a prerequisite to work being undertaken on roads.</p> <p>Prepare a Compensation Action Plan following guidelines laid out in the Compensation Policy Framework, including: obtaining and documenting agreements on land use from communities, specifically, compensation for lost food crops and economic trees</p> <p>Adequate compensation shall be provided to all affected landowners for the loss of the food crops and economic trees according to the guidelines set out in the Compensation Policy Framework.</p> <p>Identify culturally sensitive areas. Projects which impact historical or archaeological sites will not be financed.</p> <p>All required safety measures shall be implemented. This includes occupational health and safety requirements on construction sites and in work camps.</p> <p>Maximise the opportunities for local people on the project. This could include hiring of day labour for gravel crushing, maintenance of revegetation areas, and any other activities.</p> <p>Communities and landowners shall always be consulted on the disposal areas, removal of trees and other vegetation, and stockpiles for spoil material.</p> <p>Include women's and other community groups in project activities.</p>	<p>Monitor use of CPF by reviewing Compensation Plans (CP) prepared and their implementation.</p> <p>Ensure that affected parties are satisfied.</p> <p>All activities within all feeder roads /paths to be overseen by the Provincial Lands Officer and Community Liaison Officer together with the Senior Engineer (SE) in the PMU.</p> <p>Indicator: Grievances registered with Project Management Unit.</p>	<p>Compensation as per the CP.</p> <p>Senior Engineer (SE) costs</p>
<p><b>Operating of Labour Camp/s (if required)</b></p> <ul style="list-style-type: none"> <li>• Introduction of small labour force with different attitudes resulting in social conflicts</li> <li>• Introduced health problems such as STDs and HIV</li> </ul>	<p>Camps shall not be located near settlements or near drinking water supply intakes.</p> <p>They shall not negatively impact local residents' access to drinking water.</p> <p>Camps shall not be located in the vicinity of landslides and floodplains.</p> <p>The camp shall be operated within a self-sufficient infrastructure.</p> <p>No trees shall be cut for fuel wood, and removal of vegetation shall be minimised.</p> <p>The contractor shall prohibit employees from poaching wildlife</p>	<p>Camp is self sufficient in food, water and fuel: No complaints from residents, local prices remain stable.</p> <p>Provision of water and sanitation facilities constructed no disruption in local water supplies.</p> <p>Waste disposal: Upon completion, camp site is neat and no rubbish and materials remain.</p>	<p>Costs will be borne by the project through the visit by the SE during his field inspection.</p>

<ul style="list-style-type: none"> <li>• Deforestation, excessive use of fuelwood</li> <li>• Competition for scarce natural resources and food supplies</li> <li>• Pollution of surface and groundwater supplies from unsanitary waste disposal practice</li> </ul>	<p>and cutting trees. The contractor shall be responsible for the action of their workers.</p> <p>Water and sanitation facilities shall be provided for employees. In water deficient areas, the contractor shall haul water from a source outside the area. Solid waste shall be managed according to the following preference hierarchy: recycling, burial or burning. Green or organic wastes shall be composted or used as animal food.</p> <p>Water and pit latrines shall be provided for employees. Use above-water pit latrines or composting toilets at residential construction sites.</p> <p>Sewage shall be disposed of into hygienic pit latrines or into a septic tank system. In low-lying areas the latrine areas shall be elevated and constructed on a mound of sandy sediment to control seepage into the local groundwater.</p> <p>The contractor shall recruit, to the maximum extent possible, local persons for the labour force, and shall provide appropriate training where necessary.</p>		
<b>Sub project level impact</b>	<b>Proposed Mitigation Measures</b>	<b>Monitoring Measures and applicable indicator</b>	<b>Costings</b>
<p><b>Feeder Road Rehabilitation Erosion Control Management And Monitoring</b></p> <p><b>Objective</b></p> <p>To minimise the erosion of soil from sites</p>	<p>All road contractors will apply the following methods of erosion control. Compliance by the contractor will be regularly checked by the SE:</p> <ul style="list-style-type: none"> <li>• Minimise as far as practicable the time that surfaces remain bare.</li> <li>• A staged road reconstruction plan will be followed so that road reconstruction and earthworks are completed in stages (100m stages recommended) so that only a minimal area of ground is open or clear at anyone time;</li> <li>• Progressively re-vegetate and mulch disturbed areas as soon as practicable after completion of work;</li> <li>• Keep vegetation clearing to a minimum and re-vegetate cleared sites, in consultation with the landowner(s);</li> <li>• On steep slopes, and where otherwise appropriate, clear vegetation using chainsaws so that tree roots can remain to</li> </ul>	<p><b>Monitoring</b></p> <p>Monitoring of compliance with these methods of erosion control by the contractor at each site will be carried out by the SE and will occur by way of regular (at least once every two weeks) visual inspections to ensure that appropriate control structures have been installed and are operating effectively.</p> <p><b>Corrective Action</b></p> <p>Where visual inspection identifies that damage has occurred to areas then these shall be rehabilitated. The contractor will be reminded that these form Conditions of Contract and a failure to comply could lead to a breach of contract action being</p>	<p>All costs associated with these activities will be borne by the project through routine field inspection by the SE.</p>

	<p>help stabilise slopes;</p> <ul style="list-style-type: none"> <li>• Erosion control structures such as stormwater diversion (catch) drains and bunds will be constructed and maintained to temporarily divert stormwater around construction sites;</li> <li>• Onsite drainage schemes will be constructed and maintained to minimise ponding and uncontrolled runoff;</li> <li>• Avoid earthworks during high rainfall periods, if possible;</li> <li>• Side drains (depth 500mm or greater) will be installed along all roads to prevent roadside "ponding" and surface wash;</li> <li>• Design drains and culverts to remove all runoff water without scour. On steep slopes culverts may need to be stepped using rock slabs or gravel in gabion baskets;</li> <li>• Ensure major roads to be used by 12-14 tonne trucks have a base of at least 300mm to reduce the need for future rehabilitation;</li> </ul>	<p>taken.</p> <p><b>Responsible Party</b></p> <p>Under the terms of the contract, the contractor will be responsible for implementing and self-monitoring the methods of erosion control detailed above. The SE will be responsible for monitoring each contractor's compliance with these at all sites.</p> <p>Enforcement will be through advice and warning to the contractor, and if the failure to comply continues, through the application of Breach of Contract procedures</p>	
<p><b>FEEDER ROAD REHABILITATION; DUST CONTROL MANAGEMENT and MONITORING</b></p> <p><b>Objective:</b></p> <p>To minimize the generation of dust at along the feeder roads.</p>	<p>All road contractors will apply the following methods of dust control. Compliance by the contractor will be regularly checked by the SE:</p> <ul style="list-style-type: none"> <li>• All exposed /bare soil surfaces are to be mulched and re-vegetated as soon as practicable after clearing;</li> <li>• A staged road reconstruction plan will be followed so that road reconstruction and earthworks are completed in stages (100m stages recommended) so that only a minimal area of ground is open or clear at any one time;</li> <li>• During dry weather water spray will be used to dampen reconstruction working surfaces and gravels, newly-laid road surfaces and newly formed roadsides (including newly mulched and re-vegetated roadsides); if so directed by the Sr Engineer.</li> <li>• A speed restriction of 40 km per hour will be imposed on all gravel haul trucks;</li> </ul>	<p><b>Monitoring</b></p> <p>Monitoring of compliance with these methods of dust control by the contractor and or gravel pit operator at each site will be carried out by the SE. This will comprise regular (at least once every two weeks) visual inspections to ensure that appropriate control structures have been installed and are operating effectively.</p> <p>The SE will also enquire of roadside householders (focusing on the women of the households) whether they have experienced any nuisance or concerns regarding dust from passing gravel trucks or the road construction works at each site.</p> <p><b>Corrective Action</b></p>	<p>Costs will be borne by the project through the visit by the SE during his field inspection.</p>

		<p>Where inspection indicates that one or more of the above methods have not been complied with by a contractor or gravel pit operator, the contractor or operator will be reminded that these form Conditions of Contract and a failure to comply could lead to a breach of contract action being taken.</p> <p><b>Responsible Party</b></p> <p>Under the terms of the contract, the contractor will be responsible for implementing and self-monitoring the methods of erosion control detailed above. The SE will be responsible for monitoring each contractor's compliance with these at all sites.</p> <p>Enforcement will be through advice and warning to the contractor, and if the failure to comply continues, through the application of Breach of Contract procedures.</p>	
<p><b>SEDIMENTATION CONTROL MANAGEMENT AND MONITORING</b></p> <p>Objective:</p> <p>To minimise the impact of sedimentation on waterways</p>	<p>All road contractors will apply the following methods of sedimentation control. Compliance by the contractor will be regularly checked by the SE:</p> <ul style="list-style-type: none"> <li>• Complete reconstruction works and earthworks in stages so that only a minimal area of ground is exposed at any one time;</li> <li>• Avoid earthworks during periods of high rainfall, if possible;</li> <li>• Minimise the number of discharge points from the site;</li> <li>• Construct control structures such as sumps and settlement ponds around drainage points to trap sediment;</li> </ul>	<p>The SE will conduct regular inspections of all sites to assess the contractor's compliance with the sedimentation control measures set out above.</p> <p>Where road reconstruction crosses a permanent stream or other permanent watercourse, or where it runs adjacent to a permanent stream or watercourse, the SE will carry out a baseline visual inspection of the streambed, water quality (noting</p>	<p>Costs will be borne by the project through the visit by the SE during his field inspection.</p>

	<ul style="list-style-type: none"> <li>• Avoid discharging directly into streams or other water-bodies, or into garden areas. Site stormwater discharges should be constructed with flow breakers and should be located well away from streams and directed into areas of well established dense vegetation that will disperse the flow over a wide an area as possible to maximise rapid percolation and minimise overland flows;</li> <li>• Provide silt fences or similar around areas susceptible to erosion;</li> <li>• Protect construction sites from off-site surface runoff using bunds or trenches in order to minimise the amount of on-site stormwater and ponding;</li> <li>• Locate stockpiles and spoil-heaps away from any drainage channels or waterways, and contain them with silt fences and containment trenches;</li> <li>• Do not allow machinery to enter a watercourse unless this is unavoidable;</li> <li>• Avoid vehicle fording of streams. If this cannot be avoided, the vehicles must be thoroughly washed down, well away from the stream before the vehicle enters it;</li> <li>• Where weirs and diversion channels are constructed around culvert installation and headwall construction works, the walls must be properly graded and compacted to minimise the risk of collapse and entrainment of sediment in the diversion channel;</li> <li>• All diversion channel bends should be constructed with as large a radius as possible to minimise the risk of undercutting of the bend walls by the diverted waterflow;</li> <li>• Diversion channel gradients should be minimised as far as practicable and where necessary flow breakers, such as rocks or widening of the channel should be installed <i>and</i> constructed to minimise flow velocities;</li> <li>• Where culvert headwalls are constructed in-situ (for example winged headwalls), a diversion channel must be constructed</li> </ul>	<p>any turbidity or coloration of the water and water flow) at one or more sites upstream and two or more sites downstream of the construction site before construction commences. In particular the visual inspection will assess and record any differences in the streambed morphology and benthic components between the upstream and downstream sites, and any changes (increase or decreases) in the water turbidity and colouration, and water flow between these sites. These inspections will be carried out on at least two occasions, one of which should be during dry weather conditions and one during or immediately following rainfall.</p> <p>A field record including observations of water conditions (flow assessments, clarity, colour, odour and the presence of any scums), stream bed, in-stream habitats and streamside habitats, and weather will be made at each site on each occasion.</p>	
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	so that the concreting works are carried out in the dry. All construction debris and spilt concrete fines must be removed from the dry site before the flow is restored to avoid any risk of downstream contamination of the watercourse by concrete fines or other construction materials.		
<p><b>GRAVEL EXTRACTION MANAGEMENT and MONITORING</b></p> <p><b>Objective</b></p> <p>To minimize the long term impacts of gravel extraction.</p>	<p>All contractors operating gravel pits will apply the following methods of control. Compliance by the contractor will be regularly checked by the SE:</p> <ul style="list-style-type: none"> <li>the contractor shall prepare a Gravel Extraction Plan for each site providing a staged extraction program and specifying the measures to be taken at each site to minimise erosion and sedimentation of watercourses;</li> <li>Where possible, extract gravel from dry gravel pits rather than gravel pits in river channels;</li> <li>Where river gravel is extracted, machinery or equipment must not be allowed to enter the water channel, and extraction of gravels should be restricted to no closer than a minimum 5m from the water channel;</li> <li>under high flow conditions;</li> <li>Ensure containment of sediment-loaded runoff and contaminants at all quarry sites;</li> <li>Employ safety measures to avoid any loss of load from trucks;</li> <li>Ensure stability of exposed quarry faces or overburden stockpiles;</li> <li>Bund refueling areas and ensure containment of any oil leaks or spillages;</li> <li>Specify means employed to protect the channel banks, avoid discontinuities in the river bed, minimise erosion upstream and sediment loading problems downstream of the quarry site.</li> </ul>	<p>The SE will conduct regular (at least once every two weeks) inspections of all gravel extraction sites to assess the contractor's compliance with the control measures set out above.</p> <p>The SE will also ensure that regular inspection (at least once a month) of water quality upstream and downstream of the gravel extraction site is carried out throughout the period the site is operating and for at least three (3) months after all gravel extraction operations cease.</p> <p>This water quality inspection program will be based on and follow a similar format to the monitoring program proposed for the monitoring of sedimentation impacts (see previous).</p> <p>A baseline series of water quality observations will be conducted by the Environmental Specialist prior to extraction operations commencing at the site and will comprise of observations carried out at three locations (one upstream, two downstream) on at least two occasions (one following a period of dry weather and one during or immediately following rainfall). A field record including observations of water conditions (flow assessments, clarity, color, odor and the presence of any</p>	<p>Costs will be borne by the project through the visit by the SE during his field inspection.</p>

		<p>scums), stream bed, in-stream habitats and streamside habitats, and weather will be made at each site on each occasion.</p> <p><b>Corrective Action</b></p> <p>Where inspection by the SE indicates that one or more of the above methods of control have not been complied with by a contractor operating the gravel pit / extraction site, the contractor will be reminded that these form Conditions of Contract and a failure to comply could lead to a breach of contract action being taken.</p> <p>Where local landowners and other water users express their concern regarding water quality, the gravel extraction site will be inspected and additional methods of control implemented. Where the local landowners and other water users provide substantive comments on water tainting or contamination, additional water quality data will be immediately collected and expert opinion sought (see above).</p> <p><b>Responsible Party</b></p> <p>Under the terms of the contract, the contractor operating the gravel pit extraction site will be responsible for implementing and self-monitoring the mitigation measures and methods of control detailed above: The SE will be responsible for monitoring each contractor's compliance with these at all sites.</p>	
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		Enforcement will be through advice and warning to the contractor, and if the failure to comply continues, through the application of Breach of Contract procedures.	
<p><b>PUBLIC DISRUPTION AND SAFETY MANAGEMENT and MONITORING</b></p> <p><b>Objective</b></p> <p>To minimise disruption to communities during construction</p>	<p>All road contractors will apply the following measures to minimize public disruption and ensure public safety. Compliance by the contractor will be regularly checked by the SE:</p> <ul style="list-style-type: none"> <li>• Inform local authorities and local landowners of project plans, works schedule and location of proposed works;</li> <li>• Maximise opportunities for local employment associated with construction activities;</li> <li>• Include women's and other community groups in project activities;</li> <li>• Ensure that previously identified cultural sites are not disturbed;</li> <li>• Where objects of archaeological or historical importance are located during construction works, cease construction work and notify the Engineer who will in turn notify the PNG National Museum and other relevant authorities at local level. PPAP will not finance sub-projects which impact these sites;</li> <li>• Where possible, program work such that high noise levels occur during times of least impact (Le. during normal working hours avoiding Saturdays and Sundays);</li> <li>• Minimise noise impacts by maintaining construction equipment in good order;</li> <li>• Discuss with externally-sourced construction workers the need for considerate and safe behaviour while located in the area; Raise awareness amongst landowners / villagers of HIV/AIDS.</li> </ul>	<p><b>Monitoring</b></p> <p>Regular monitoring shall be undertaken by the contractor and the SE by way of discussions with local residents, with a particular focus on the women, youth and elderly, to ensure that communities are not unduly affected by construction activities and that all local people are aware of the safety risks and the appropriate measures they should take to avoid injury or accident.</p> <p><b>Corrective Action</b></p> <p>Any complaints from the community will be investigated and action taken, if necessary, to minimise the specified disruption.</p> <p>Where inspection or substantiated complaints indicate that one or more of the above measures have not been complied with by a contractor or gravel pit operator, the contractor or operator will be reminded that these form Conditions of Contract and that a failure to comply could lead to a breach of contract action being taken.</p> <p><b>Responsible Party</b></p> <p>Under the terms of the contract, the contractor will be responsible for</p>	<p>Costs will be borne by the project through the visit by the SE during his field inspection.</p>

		<p>implementing and self-monitoring the measures to minimise public disruption and ensure public safety detailed above. The SE will be responsible for monitoring each contractor's compliance with these at all sites.</p> <p>Enforcement will be through advice and warning to the contractor, and if the failure to comply continues, through the application of Breach of Contract procedures.</p>	
<p><b>GENERAL SITE MANAGEMENT and MONITORING</b></p> <p><b>Objective:</b></p> <p>To provide and maintain a clean and safe working environment</p>	<p>All road contractors will apply the following methods of general site management to maintain a clean and safe working environment. Compliance by the contractor will be regularly checked by the SE:</p> <ul style="list-style-type: none"> <li>• Provide and maintain adequate warning signs at construction site boundaries;</li> <li>• Maintain materials used for vehicle maintenance and repair in a clearly marked and secure area;</li> <li>• Spray water on exposed surfaces, resulting from construction works, during dry periods and stabilise disturbed areas as soon as practicable to prevent dust problems;</li> <li>• Wet any spoil loads being carried in open trucks in dry weather;</li> <li>• Operate and maintain plant and equipment in accordance with manufacturer's instructions;</li> <li>• Provide an impervious and bunded area for oil and fuel transfer and cleaning of equipment and vehicles;</li> <li>• Minimise waste generated through reduction, reuse, recycling and composting;</li> <li>• Prior to removal from site, store all waste in suitable areas/receptacles to prevent hazards such as fires, attraction to vermin or dissemination of dust;</li> </ul>	<p><b>Monitoring</b></p> <p>Regular monitoring shall be undertaken by the SE by way of visual inspection to ensure that all construction sites fully comply with the measures specified above.</p> <p>The SE will also enquire of local residents, with a particular focus on women, youth and the elderly, whether they have experienced any nuisance or have concerns regarding the construction site and its operations.</p> <p><b>Corrective Action</b></p> <p>Any complaints from the community will be investigated and action taken, if necessary, to minimise the specified disruption.</p> <p>Where inspection or substantiated complaints indicate that one or more of the above measures have not been complied with by a contractor or gravel pit operator, the contractor or operator will be</p>	<p>Costs will be borne by the project through the visit by the SE during his field inspection.</p>

	<ul style="list-style-type: none"> <li>• Dispose of all inorganic construction waste at a Council-designated dump site;</li> <li>• Remove all disabled machinery from the project site;</li> <li>• Ensure adequate sanitation is provided for construction workers and that it does not contaminate groundwater;</li> <li>• Minimise depressions and screen areas of standing water to reduce potential for mosquito breeding;</li> <li>• Ensure occupational health and safety measures and equipment are in place on construction sites and that workers receive appropriate training/induction (including in HIV / AIDS).</li> </ul>	<p>reminded that these form Conditions of Contract and that a failure to comply could lead to a breach of contract action being taken.</p> <p><b>Responsible Party</b></p> <p>Under the terms of the contract, the contractor will be responsible for implementing and self-monitoring the general site management measures detailed above. The SE will be responsible for monitoring each contractor's compliance with these at all sites.</p> <p>Enforcement will be through advice and warning to the contractor, and if the failure to comply continues, through the application of Breach of Contract procedures.</p>	
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**Table 6: Proposed Mitigation and Monitoring Measures for Wharves and Jetties**

Subproject level impact	Proposed Mitigation Measures	Monitoring Measures and applicable indicators	Costings
Rehabilitation of wharfs and jetties	<p>Ensure work on the wharf and jetties are limited to the extent of the described works</p> <p>Design and siting, avoid sensitive areas</p> <p>Siltation control:</p> <ul style="list-style-type: none"> <li>• Silt curtains</li> <li>• Settling ponds</li> <li>• Appropriate technology (use what is practical to minimize impact of jetties or wharfs on the surrounding marine ecosystem)</li> </ul>	<p>Regular monitoring to ensure that the scope of work on the jetty and wharf are followed.</p> <p>Monitor after construction to determine if impact would have reduced and reached background levels</p>	<p>Monitoring costs are those of SE and ES field visits.</p>

### **6.3 Environmental Supervision and Monitoring**

The main objective of environmental supervision is to ensure that the recommended mitigation measures are implemented as required by the works contractor (component 3) and project partners (component 2). In road rehabilitation projects, environmental supervision is often part of the standard construction supervision. It will be important to specifically outline exactly what needs to be focused on during the supervision. By including clauses into a contract document and specific items in the Bill of Quantities forming part of the contract, monitoring and supervision of the application of mitigation measures is automatically included in the normal engineering supervision of the contract on a day-to-day basis. Once the Environmental Specialist is in place under PPAP, s/he would ensure appropriate training of key PPAP staff and quality control of the supervision of environmental mitigation measures. DEC could also be invited to participate in regular reviews.

A very important aspect of environmental management is environmental monitoring. Monitoring has two objectives. The first and simplest is compliance monitoring which basically ensures that mitigation measures are properly implemented. This is part of the supervisory activities discussed above and is generally the one that most monitoring programmes focus on. Detailed monitoring recommendations are included in Table 9 - 11 including suggested parameters and indicators.

The second aspect of environmental monitoring is impact monitoring. The main objective of impact monitoring is to determine whether the environmental mitigation measures implemented prove to be effective in reducing anticipated impacts. This monitoring allows the mitigation measures to be modified if the original measures prove to be ineffective.

Impact monitoring is the most difficult type of monitoring as it sometimes requires long term programmes, some existing expertise and adequate funding. Obviously, a clear commitment to effective environmental management is necessary in order for an impact monitoring programme to be successful.

## **7.0 Institutional Requirements for Effective Implementation of the ESMF**

### **7.1 Public Participation**

World Bank requirements OP 4.01 stipulate that the involvement of the public in any project is an important aspect of environmental management.

Any road rehabilitation project in PNG is likely to have at least some impacts on local people, and their involvement at the earliest stages of project feasibility is essential, particularly where any asset loss, however minor, is likely. In addition, the particular conditions in PNG make it important for villagers to be directly involved in the maintenance works, requiring a more creative and flexible approach to contracting than is normally the case. In PNG, the DOW works very closely with the Department of Lands in order to ensure that land issues are addressed at the earliest possible stages. It is recommended that this structure continue to be applied in the present project. The Compensation Policy Framework in Part III of the Environmental Management and Social Framework states these arrangements.

PPAP should receive a confirmation of broad community support for specific subprojects, therefore each subproject should be prefaced with full engagement with a broad representation of the community to be affected. Community support should be documented (as per earlier forms and the CPF indicate).

## **7.2 Staffing, Technical Assistance and Training Requirements for DAL, CB and CIC**

### **7.2.1 Technical Assistance**

The proposed Project Coordination Unit (PCU) within DAL will provide coordination of the PPAP at the national level. Discussions with the Deputy Secretary - Science and Technology and other of DAL, Cocoa Board and CIC determined the need for Technical Assistance to support the implementation of the ESMF. The TA (Environmental Specialist) would also build capacity of key PCU and PMU staff, as well as other relevant staff in those institutions. This Technical Assistance will be required for three months in year 1 and on a decreasing basis in subsequent years. Upon engagement, the Environmental Specialist will be required to visit the project provinces to oversee the EMP being implemented through the PPAP, ensure that all workflows and processes for the implementation of the ESMF are in place and operating, and start training and capacity building of key staff. S/he will then continue to ensure that such capacity is built within the implementing agencies, and with key staff in the PMUs (such as the Component 2 coordinator and Transport Planner/Sr. Engineer). By providing quarterly report to the DEC, the PMUs will be adhering to the requirements of the Environmental Act 2000.

Terms of Reference for this position can be found in Appendix 4.

### **7.2.2 Institutional Framework for Environmental and Social Management**

The main institutions with key responsibilities for environment and social management are the Project Management Units in CIC and Cocoa Board and the Project Coordination Unit at DAL.

#### **7.2.2.1 National Level**

Overall policy guidance and coordination of the PPAP will be provided through the Project Steering Committee (PSC). The PSC is responsible for overseeing the implementation of the PPAP and monitoring its performance to ensure that the goals of the program are being achieved. The PSC meets at least six-monthly, and consists of representatives of the commodity boards and other stakeholders in the PPAP. DEC is a member of the PSC.

The Project Coordinator heading the PCU in DAL has overall responsibility for the management of all monitoring and evaluation activities under the PPAP. S/he will therefore have overall responsibility for environmental and social monitoring, with support from the Environment Specialist and other technical staff.

#### **7.2.2.2 Industry Level**

Implementation of the PPAP is the responsibility of the Coffee Industry Corporation (CIC) and the Cocoa Board (CB), through their respective PMUs, which report to the CEO of the CIC and Cocoa Board (respectively) through their Project Manager (PM). The PMUs are responsible for daily management of project implementation, including the effective implementation of the ESMF.

The PMU based in Goroka within the CIC will be guided by a Coffee Industry Coordination Committee (CICC), which would also act as an industry-level steering committee for the PPAP. Similarly, the PMU based in Kokopo within the Cocoa Board would be guided by a Cocoa Industry Coordination Committee (Cocoa ICC), which would act as an industry-level steering committee for the PPAP. Due to the special status of ARB, a Deputy PMU Manager reporting to the Project Manager in Kokopo would be based in the Cocoa Board office in Buka. S/he will be responsible for ensuring the effective implementation of the ESMF in ARB.

A Senior Engineer will also be part of each PMU and be responsible for the implementation of Component 3. This includes the implementation of the ESMF at component level.

Similarly, the responsibility for the management and supervision of the implementation of the ESMF for Component 2 activities will rest with the Component 2 Coordinator in each PMU.

Both PMUs will be supported by the Environment Specialist, and by a Technical Appraisal Committee including expertise on social sciences. They will also be supported by the Provincial Lands Officer (PLO) and Community Liaison Officer (CLO). Responsibilities for the environmental and social management of PPAP will include:

- (i) complying with the relevant national laws regarding the environment and with all social guidelines set by the GoPNG, and all World Bank Safeguards policies;
- (ii) supervising the implementation of PPAP subproject activities according to and consistent with the provisions of this ESMF;
- (iii) ensuring that the mitigation measures are complied with during identification, implementation/construction and operation stages of PPAP activities, by monitoring these activities and by periodically reporting to the PMU and PCU; maintaining an adequate budget to implement the appropriate procedures and practices for their operations; and
- (vi) complying with any directives that may be issued from time to time from DEC or DAL.

### 7.2.2.3 Summary Institutional Roles and Responsibilities for Environment and Social Management

**Table 8: Key responsibilities**

<b>Position</b>	<b>Main responsibility</b>
Project Steering Committee and Industry Coordination Committees	Overall policy guidance to the PCU and PMUs
Project Coordinator (PCU, DAL)	Overall compliance with the ESMF
Environmental Specialist	Quality control and capacity building
Project Managers (CB and CIC)	Compliance with the ESMF for all activities under their responsibility/PMU
Component 2 Coordinator	Compliance with the ESMF for all Component 2 activities
Technical Appraisal Committee	Appraisal of subprojects under Component 2 including environmental and social aspects.
Senior Engineer	Compliance with the ESMF for all Component 3 activities

The project costs include a budget to ensure the mobilization of the required TA (Environmental Specialist) as well as an operational budget to ensure that all key staff above are able to carry out their due diligence in ensuring that all approved activities comply with the provisions of this ESMF.

