



SOLOMON ISLANDS GOVERNMENT

MINISTRY OF DEVELOPMENT PLANNING AND AID COORDINATION

## **RURAL DEVELOPMENT PROGRAM Phase 2 (RDP II)**

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

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## ACRONYMS

CBC	Centre for Biodiversity and Conservation
CBD	Convention on Biological Diversity
CBO	Community Based Organisations
CCA	Community Conservation Agreement
CCOSI	Conservation Council of Solomon Islands
CI	Conservation International
CITES	Convention on Illegal Trade in Endangered Species of Flora and Fauna
Community	A village or group of villages which associate together periodically for common purposes such as support to health, education, church activities.
COP	Conference of the Parties
CROP	Council of Regional Organisations of the Pacific
CSO	Community Service Organization
DFEC	Department of Forestry, Environment and Conservation
DFMR	Department of Fisheries and Marine Resources
DNPAC	Department of National Planning and Aid Coordination
EAC	Environment Advisory Committee
ECANSI	Environmental Concerns Action Network of Solomon Islands
ECD	Environment and Conservation Division
EIA	Environmental Impact Assessment
ESMF	Environmental and Social Management Framework
EU	European Union
FAO	Food and Agriculture Organisation
FD	Forestry Division
FRTUA	Forest Resources and Timber Utilisation Act
FSC	Forest Stewardship Certification
FSPI	Foundation for Peoples of the South Pacific
GCCG	Grand Coalition for Change Government
GCRMN	Global Coral Reef Monitoring Network
GEF	Global Environment Facility
GMO	Genetically Modified Organism
HRD	Human Resource Development
ICZM	Integrated Coastal Zone Management
IFAD	International Fund for Agriculture Development
IUCN	International Union for the Conservation of Nature (World Nature Conservation Union)
JICA	Japan International Cooperation Agency
KGA	Kastom Gaden Association
LLCTC	Lauru Land Conference of Tribal Community
LMO	Living Modified Organism
MAL	Ministry of Agriculture and Livestock
MCCF	Makira Community Conservation Foundation
MDG	Millennium Development Goal
MDPAC	Ministry of Development Planning and Aid Coordination
MECDM	Ministry of Environment, Climate Change, Disaster Management and Meteorology
MOU	Memorandum of Understanding
MPA	Marine Protected Area

NAP	National Action Plan
NAPA	National Adaptation Plan of Action
NBSAP	National Biodiversity Strategic Action Plan
NCSA	National Capacity Self Assessment
NEMS	National Environmental Management Strategy
NERRDP	National Economic Recovery, Reform and Development Plan 2003-2006
NGO	Non-Governmental Organization
NIS	National Implementation Strategy
NRDF	Natural Resources Development Foundation
NRM	Natural Resource Management
NRRC	Natural Resources and Rights Coalition
NSDS	National Sustainable Development Strategy
PCU	Project Coordination Unit
PGA	Provincial Government Act
PG	Provincial Government
PPBC	Provincial Prioritisation and Budget Committee
PSU	Provincial Support Unit
RAMSI	Regional Assistance Mission to the Solomon Islands
RDP I	Rural Development Program I (first phase)
RDP II	Rural Development Program II (second phase)
RMO	Resource Management Ordinance
RVRMIDP	Roviana and Vonavona Resource Management and Development Program
SBD	Solomon Islands Dollar
SI	Solomon Islands
SIDS	Small Island Developing States
SIDT	Solomon Islands Development Trust
SIG	Solomon Islands Government
SILMMA	Solomon Islands Locally Managed Marine Area network
SIS	Small Island States
SISDAC	Solomon Islands Sustainable Development Advisory Council
SOLFRIS	Solomon Islands Forests Inventory System
SOPAC	South Pacific Applied Geosciences Commission
SPBCP	South Pacific Biodiversity Conservation Project
SPC	Secretariat of the Pacific Communities
SPREP	South Pacific Regional Environment Programme
TCF	Tirola Conservation Foundation
TNC	The Nature Conservancy
UNCBD	United Nations Convention on Biological Diversity
UNFCCC	United Nations Framework on Climate Change Convention
UNDP	United Nations Development Program
UNESCO	United Nations Education, Science and Cultural Organisation
WHC	World Heritage Convention
WVSI	World Vision -Solomon Islands
WWF	World Wide Fund for Nature -Solomon Islands

## EXECUTIVE SUMMARY

The Rural Development Program RDP has been prepared as the first phase of a long-term program to support the Solomon Island's national rural development goals. The first RDP has been implemented from 2008 to early 2015 and RDP II has been being prepared during 2014.

As there are many similarities of project components between the RDP II and some past or on-going projects, this Environmental and Social Management Framework (ESMF) inherits the information provided in the ESMF and its supplement documents of RDP I, ESMF of the Papua New Guinea Agricultural Partnership Program (PPAP) and Community Climate Resilience Project. The lessons learnt from these projects have also been incorporated into this Draft ESMF.

The development objective of the proposed RDP II is to *improve access to basic services in rural areas and to improve farming practices leading to increased production and productivity.*

The RDP II includes three components: (i) Community Infrastructure and Services; (ii) Agriculture Partnerships and Support; and (iii) Program Management. The RDP II would cover all provinces of the Solomon Islands.

The RDP will be implemented under the following legislative requirements: (a) SI Environment Act 1998; (b) SI Wildlife Protection and Management Act 1998; (c) the World Bank's Safeguard policies

The Solomon Islands is rich in terms of ecosystems and biodiversity, many species are endemic and many fauna and flora are endangered. The environment of the Solomon Islands is threatened by:

- extreme weather events (Natural Disasters) such as cyclones, earthquakes, landslides, floods, droughts and Tsunamis;
- these extreme weather conditions are likely to increase in frequency and severity under the influence of climate change, along with pressure for people to move to higher ground to grow food and cash crops;
- unsustainable logging practices, leading to habitat destruction and potential for increased soil erosion, landslides and flooding;
- high rate of population growth and young median age, underemployment leading to pressure to develop income from cash crops, hence further habitat destruction; and
- very small area of important natural habitat protected (0.28% of the land area).

The majority of investments under RDP II will be small in scale and will involve the rehabilitation or upgrading of existing small-scale infrastructure. Construction of new facilities is also expected to be small in scope. The investments for each village is limited to below USD 30,000 (SBD 200,000). The potential impact of any subproject will depend on the nature, location and specific characteristics of the investment. In most cases, adverse environmental impacts are expected to be temporary and limited to the construction phase. They could include temporary disturbance of drains or streams, noise and dust during construction, small-scale vegetation loss, and pollution from inappropriate construction materials waste disposal. The subproject screening process and the use of standard Environmental Codes of Practice will ensure adequate mitigation of those risks. Civil works contracts will include standard clauses to ensure the mitigation of any potentially negative impact.

Community consultation is also an integral part of the selection and appraisal of activities during RDP II implementation. Project beneficiaries will participate through public consultation meetings and discussions of local development priorities, representation in ward development committees and provincial development councils, and representation in the Subproject Implementation Committees (SICs). Feedback mechanisms and community monitoring of project implementation have also been included under RDP.

No subproject will be selected that does not flow from this planning process. This includes the social and environmental information, training and screening process described in detail in the ESMF. Facilitators will also be trained on the project's environmental and social guidelines. Since environmental and social criteria will be fully integrated throughout the planning, selection and appraisal process, stakeholder participation and information disclosure will be assured at every stage of program implementation. In the case that a specific subproject would require a standalone EA, this would be posted in public places at province and ward level, and the ward development council will be responsible to ensure that the EA report is formally on the agenda of decision meetings for project selection.

The ESMF described in detail under chapter 6 and guiding RDP implementation has been designed to achieve sound environmental practice and ecologically sustainable outcomes. The ESMF provides the mechanism to allow project implementation by screening out subproject proposals that are unacceptable on the basis of environmental or social criteria. The aim of the ESMF is that all processes can be adjusted based on implementation experience. The Program Implementation Manual (PIM) of RDP will integrate the ESMF to assure its implementation. A "Negative List" outlines which activities cannot be funded:

- Subprojects supports the areas named in the Exclusion list of the World Bank Safeguard Policies, e.g. political, military/security, religious activities, though RDP II will be working closely with church groups, businesses involves addictive materials etc.
- Sub-projects that involve the significant conversion or degradation of critical natural habitats and forests;
- Activities that could lead to invasion or spread of weeds and feral animals or the use of toxic chemicals (as prescribed under the SI Environment Act 1998);
- Activities involving Involuntary Resettlement.

The EA/ESMF contains the following six chapters:

Chapter 1 discuss the context of RDP II development and safeguard management requirements of the Solomon Island governments and the World Bank

Chapter 2 briefly describe the proposed program and its components, which has been developed by SIG with the cooperation of the World Bank, Australian Aid and the European Union.

Chapter 3 discuss about Solomon Islands legislations, Institutional Capacity and International Agreements

Chapter 4 describes the Solomon Islands environment conservation initiatives that have been developed over the years, by SIG and provincial governments

Chapter 5 describes the proposed investments, its potential environmental and social impacts

Chapter 6; provides a framework for environmental and social screening of individual sub projects

to ensure that any activity which is funded under RDP does not have a deleterious effect on the environment (including social aspects), and that the participatory process is inclusive. This ESMF guide the project implementers on the steps to follows for identifying subproject potential environmental and social issues, the mitigation measures for the design, construction and operation of the facilities to be provided as well as arrangements for implementation.

Seven annexes provide technical tools for project implementers to use as reference for identifying, safeguard issues of subprojects and specific procedures to follow under certain special circumstances.



# **CHAPTER 1 INTRODUCTION**

## **1. Project Background**

Following the success of the Rural Development Program implemented in Solomon Islands from 2008 to early 2015, the Solomon Islands Government (SIG) requested support from the World Bank, International Fund for Agriculture Development (IFAD), the European Union (EU) and DFAT/Australian Aid assistance for the preparation of the second Rural Development Program to improve access to basic services in rural areas and to improve farming practices leading to increased production and productivity

The purpose of the Environmental Assessment (EA)/Environmental and Social Management Framework (ESMF) is to guide the implementation of the Solomon Islands Rural Development Program II (RDP II). Further to ensure that the project has been prepared in accordance with the requirements of the Solomon Islands Government and the World Bank Environmental and Social Safeguard Policies

## **2. Solomon Islands Environmental Legislation**

The Solomon Islands legislation regarding environmental protection is covered by the Environment Act 1998 and Wildlife Protection and Management Act 1998, both of these acts were formally gazetted on September 1, 2003.

Under the Environment Act, Section 18, (ii) any developer is required to provide to the Director of the Department of Environment and Conservation a " public environmental report or environmental impact statement, as the case may require, in accordance with this Part2."

## **3. The World Bank Safeguard Policies**

### **OP 4.01 Environmental Assessment**

The World Bank requires environmental screening to be carried out for investments financed by the World Bank. Environmental impacts must be identified at an early stage so that the impacts can be avoided, mitigated or compensated.

In compliance with OP 4.01, environmental screening has been carried out for RDP II. The RDP has been classified as Environmental Category B as the type and scale of the proposed physical investments will be at small scale, short term and can be mitigated. Under Component 2, potential negative impacts associated with support provided to agricultural sector would be the main concerns, particularly if pesticide is supplied for agricultural cultivation.

An Environmental and Social Management Framework (ESMF, this document) has been prepared for RDP II. This ESMF was prepared based on the two ESMFs prepared earlier for two similar Bank-financed projects:

- The ESMF developed in 2007 for RDP as the design of Component 1 is essentially the same for RDP I as for RDP II
- The ESMF of the Papua New Guinea Productive Partnerships in Agriculture Project (PPAP) as the design of sub-component 1B - Agriculture Partnership Financing under RDP II follows a similar model applied in the PPAP

The lessons learnt from RDP II and PPAP implementation has been incorporated into this ESMF for application for RDP II.

#### **Natural Habitats (OP/BP 4.04)**

This policy is triggered in RDP II. Environmental screening will ensure that project site selection avoids critical habitats, and negative potential impacts on other natural habitats such as streams, lakes etc. will be mitigated.

#### **Pest Management (OB/BP 4.09)**

Under Component 2, agricultural partnership, grant recipients may purchase chemicals for enhancing cocoa, coconut or other crop production. The Pesticide Registration Advisory Committee (PRAC), which advises the Registrar, will continue to be used to control pesticide imports, distribution, sale and use. Enforcement of the regulation is the responsibility of the Ministry of Agriculture and Livestock. The ESMF will include a Pest Management Plan to ensure safety for human and the environment associated with the transport, storage, handling and disposals of agricultural chemicals including packaging materials.

#### **Physical Cultural Resources (OP/BP 4.11)**

This policy is not triggered in RDP II as there will be only very limited earth works under Component 1. Subproject siting will avoid known physical cultural resources such as structures of spiritual value to communities, objects and structures having high landscape values etc. Chance Find Procedures will be included in the ESMF to address the cases where objects are found during ground excavation.

#### **Forests (OP/BP 4.36)**

This policy is not triggered in RDP II as the size of sub-project sites will be very small and located within existing communities, deforestation for infrastructure development will not happen in RDP II. Component 2 mainly involving support on farming techniques with the aims of improving productivity of existing plantations rather than expanding the existing cultivation areas. Therefore, the activities under Component 2 of RDP II are not envisaged to affect forest, forest health and forest-dependent communities.

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

The investments under RDP II, will be carried out in 9 provinces in which Indigenous Peoples are the overwhelming majority of project beneficiaries as known for Solomon Islands. Therefore, a separate Indigenous Peoples Plan is not required, but provisions responding to the policy will be incorporated into overall project design. This is the same approach to that adopted under RDP I.

The ESMF and Project Implementation Manual currently being used for RDP I will continue to be applied, including an inclusive, participatory community needs assessment process, screening criteria, and forms to document broad community support and consensus on priority sub-projects. Community consultations will be facilitated and documented by suitably qualified personnel, in particular,

Community Helpers which are employed through the Project and based in villages. Ongoing monitoring and community consultations by such personnel will assess whether broad community support is maintained during implementation.

Each sub-project will be identified and driven by the recipient community which will ensure that Free, Prior and Informed Consultation will be built into each sub-project conception and development and that the subproject will provide benefits that are culturally appropriate to the people. In addition to the agreed criteria in the ESMF, the community driven nature of the sub-projects will further serve to ensure compliance with OP/BP 4.10

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

Screening criteria including undisputed access to land for the purposes of executing the sub-project are prerequisites to inclusion of sub-project in the program. Land to be used for subproject construction will be voluntarily donated and recorded through signatures by the appropriate customary landowners to a Land Commitment Letter. No involuntary resettlement as a result of the project is anticipated. Component 2 activities will not include the conversion of land for the purpose of agricultural use.

## CHAPTER 2 PROJECT DESCRIPTION

The Rural Development Program II (RDPII) has been prepared as the second project in a long-term program to support the Solomon Islands' national rural development goals.

**The Program Development Objective (DPO)** is to improve access to basic services in rural areas and to improve farming practices leading to increased production and productivity. The expected key results of the program are:

- Number of male and female beneficiaries with improved quality of, and/or, proximity to rural infrastructure or services
- Number of farming households applying improved farming practices
- Percentage increase in production for farmers engaged in partnerships

The project will be implemented in the 9 provinces including: Makira, Isabel, Guadalcanal, Central, Choiseul, Malaita, Western, Temotu and Rennell and Belona. Choiseul and Temotu are small provinces with a population of approximately 20,000 each and Rennell and Belona have a combined population of approximately 3,000; all four island groups are remote from the capital city, Honiara; while Malaita is the most populated province (population approximately 120,000) and centrally located, and Western province has a population of approximately 60,000.

RDP II comprises of three components described below:

**Component 1 – Community Infrastructure and Services** (US\$ 22.1 million). The Project would retain all the community-driven development mechanisms developed and refined during the first phase of the RDP with a number of minor modifications based on implementation lessons and evaluation findings. The subcomponents are:

(a) **Community Development Grants** will be delivered in two cycles covering all of the country's 171 rural wards. Ward grants will normally be disbursed to communities for agreed priority sub-project(s) in two tranches, the second of which will be a "progress-based disbursement" based on the verified achievement of an agreed milestone from the project work plan. The menu of eligible and ineligible sub-projects types will remain the same as for RDP I, but an effort will be made to ensure that communities understand the full range of options, in particular public economic activities, capacity building and training, very little of which has been prioritized under RDP I.

(b) **Community facilitation and capacity development** will continue to provide community level support by Community Helpers (CHs), but approximately half of these CHs will be converted to Technical Community Helpers (TCHs) who will provide engineering and technical services. A partnership with local training providers will be formed to deliver training for CHs, and intensive technical training for TCHs. A pilot social accountability activity utilizing Community Scorecards will also be carried out focusing on the quality of services delivered by RDP-financed facilities, and beginning with the education sector in collaboration with the Ministry of Education and Human Resource Development.

(c) **Provincial support** will be provided mainly by way of Provincial Support Unit (PSUs) in each province and by leveraging the resources and systems of Provincial Government, Constituency Development Offices, and line ministries with staff operating at the provincial

level.

(d) **Rural infrastructure disaster recovery and resilience** support will be provided to the communities in Guadalcanal most badly affected by the April 2014 flash floods. Disaster assessments will be used to identify the most affected communities and each of these communities will receive grants to repair or rebuild damaged infrastructure which receives the highest priority by the community.

**Component 2 – Agriculture Partnerships and Support** (US\$ 17.4 million). This component aims to increase agricultural production and productivity through improved, climate resilient farming practice, diversification and commercial activity. The subcomponents are:

(e) **Agriculture partnership grants** will promote the development of stronger, more profitable, alliances between private sector agribusinesses and smallholder farmers. Such partnerships will provide for financing, business development services, market linkages, capacity building and policy/institutional support. Partnerships must include smallholders and measures that assist them to improve their productivity and connection to markets in order to qualify for support. Partnerships may also include agricultural input suppliers, traders, agents, financial institutions, service providers, government agencies, NGOs, CSOs, transporters, processors, exporters and end-users. Partnerships may be based on one or more agricultural or livestock commodities.

(f) **Agriculture Supplemental Equity Facility (ASEF) grants** will re-activate the SEF activity which was created under RDP I. The facility would be accessed through the commercial banks for projects in which the borrower contributes 20% of the cost, and the bank is prepared to lend 60%. The remaining 20% will be financed by a SEF grant to the borrower. Eligibility would be limited to enterprises engaged in the agriculture sector (broadly defined, including primary production as well as other activities in the value-chain).

(g) **Agricultural commercialization** will strengthen the enabling environment for development of the agricultural sector through support to the ongoing Ministry of Agriculture and Livestock (MAL) restructuring and capacity building process, direct support to farmer groups (in particular, women's farmers), improved industry coordination, and adaptive research (focused mainly on cocoa and coconut).

(h) **Agriculture and livestock disaster recovery and resilience** will help to replace agriculture and livestock assets (in particular, pigs and poultry), repair or replace agriculture and livestock infrastructure, and rehabilitate inundated commercial farming blocks (cocoa, in particular) in Guadalcanal communities affected by the April 2014 flash floods. This activity will also develop and deliver training and awareness building materials on climate and disaster resilient farming practices to farmers in all provinces through MAL's extension services.

**Component 3 – Program Management** (US\$ 5.4 million). Most of the management activities and associated costs that are specific to each component would be managed within those components. Only core, cross-component management functions would remain under this overarching component including: overall program management, finance, procurement, overall M&E/MIS, and environmental safeguards.

## CHAPTER 3 SOLOMON ISLANDS LEGISLATION, INSTITUTIONAL CAPACITY

### 1. National Legislation

The key Solomon Islands environmental legislations applicable to the RDPII are the Environmental Act 1998 and the Wildlife Protection and Management Act (WPMA) 1998.

#### *1.1 Environment Act 1998*

The Environmental Act includes 5 parts in which Part 1 provides basic definitions and interpretation of key terms used in the Act. Part II set out the functions and the national's two key environmental authorities namely the Environmental and Conservation Division (ECD) and the Environmental Advisory Committee. Part III set out regulations on Environmental Impacts Assessment, review and monitoring of development Activities. Under this part, the Law requires the Director, the ECD and relevant public authorities will consider the potential impacts of development proposals on the environment. Developers of prescribed development (listed in Schedule 2 of the Act and annexed in this ESMF) bear the responsibilities of preparing Environmental Report and submit to ECD for considerations. Part IV provides provisions on pollution Control.

#### *1.2 Wildlife Management and Protection Act 1998*

The Wildlife Management and Protection Act 1998 provides for the protection, conservation and management of wildlife in Solomon Islands by regulating the export and import of certain animals and plants. It also enables Solomon Islands to comply with the obligations under the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). One of the features of the act is that it also provides the opportunity for the development of species management plans which can include the protection of a species habitat.

The objective of the WPMA is to provide regulations on international trading of the country's wildlife resource including birds reptiles, amphibians, mammals, insects, plants and marine organisms. As SI became a member of CITES in 2007, the development of regulations now include all CITES requirements.

### 3 Provincial Legislations

Under the Provincial Government Act 1997, provinces have been given the power through devolution orders, to formulate relevant legislation covering environment and conservation. Many provinces have enacted their own legislation covering some of the relevant environmental issues such as in protected areas development. Some of the provincial ordinances enacted by the respective provinces are given below:

**Table 1 Relevant Provincial Ordinances**

Province	Ordinance
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Choiseul	Choiseul Province Resources Management Ordinance 1997
Malaita	Malaita Province Wildlife Management and Licensing Ordinance 1995
Temotu	Temotu Province Environmental Protection Ordinance 1994
Guadalcanal	Guadalcanal Province Wildlife Management Areas Ordinance 1990
Western Province	Western province Resources Management Ordinance 1994, Western Province Coastal and Lagoon Shipping Ordinance 1991
Isabel	Province Conservation Areas Ordinance 1993, Isabel Province Wildlife Sanctuary Ordinance 1995

This provincial legislation has been effective in that it has allowed concrete action to be taken at the community level especially on site where there are gaps and weaknesses in the national legislation in certain areas such as in the development of conservation or protected areas. Implementation and management of the provincial ordinances share the same problems as the national legislation in terms of funding and capacity constraints.

## **4 International Legislations/Agreements**

The Solomon Islands is a party to many Multilateral Environmental Agreements (MEAs) that commit the country to numerous obligations for safeguarding the environment and the sustainable utilization of the resources therein. Some of the major MEAs which are signed and ratified or acceded to by Solomon Islands are referred to below.

### ***4.1 Convention on Biological Diversity (CBD)***

The Solomon Islands has received assistance from the Global Environment Facility (GEF) for a number "enabling activities" under this convention. One of the main requirements of the convention is the development of a national biodiversity strategy and action plan (NBSAP). Solomon Islands is also a party to the Biosafety protocol, which is the protocol of the Convention to date.

### ***4.2 The Stockholm Convention on Persistent Organic Pollutants (POPs)***

The Solomon Islands has carried out some inventories of persistent organic pollutants prior to the adoption of the convention, as part of a region wide assessment programme. An enabling activity programme which will produce a national implementation plan is yet to be finalized. The focal point for the convention is MECDM.

### ***4.3 The World Heritage Convention***

The Solomon Islands nominated East Rennell as a World Heritage site under this convention. The nomination was accepted by the World Heritage Committee and the first world heritage site in the insular Pacific came into being.

## **5 National Environmental Management Strategy (NEMS)**

The Solomon Islands National Environment Management Strategy (NEMS) was produced in 1992. It is already out of date but remains a useful strategy for environmental management in the country in the

absence of any successive strategy in the environment sector. NEMS focuses on the following five broad strategies;

- Adopt an integrated approach to environmental policy and planning,
- Submit proposed policies , development programmes and projects to environment impact assessment,
- Introduce a comprehensive framework of national and provincial environmental law, together with the means for its enforcement in a communally acceptable manner,
- Review adequacy of institutional mechanisms and administrative controls and strengthen them as necessary, and
- Institute resource pricing in the national accounts and other economic policy for achieving sustainability.

The strategy contains a wish list of too many activities whose funding sources were never identified when the strategy was drawn up, and hence suffered implementation problems due to neglect and lack of support from donors and key players in environment and conservation. However, most of the priority activities identified in the strategy have been implemented. Many NGOs and civil societies have also implemented the relevant programs of the NEMS. Successive governments have promised to revise the NEMS but nothing has materialized. The current GCCG government has again included in its policy to review it.

## **6. Environmental Management Capacity of the Borrower**

The Environment and Conservation Division, under MECDM is responsible for administering the two main legal acts, the Environmental Act 998 and the Wildlife Management and Protection Act 1998

The in-country capacity for implementing safeguard is limited. However, the borrower has demonstrated an effective ability to manage environmental and social safeguards under RDP I. During the preparation of RDP II, the safeguard procedures being applied in RDP has been revised and some modifications were proposed for application in RDP in order to suit the stakeholders capacity and project implementation arrangements. A qualified Environmental Officer will be recruited to work in the Project Coordination Unit (PCU) who is responsible for participation, monitoring and supervising the implementation of safeguard procedures in RDP II.

Through RDP I, the Ministry of Agriculture and Livestock has built its capacity to regulate agriculture-related environmental safeguards, including the formation and regular convening of a Pesticide Registration Advisory Committee (PRAC) to regulate the use of pesticides. Periodic training will be conducted for safeguard and other project staff as well as for funding recipients under Components 1 and 2.



## **CHAPTER 4 SOLOMON ISLANDS ENVIRONMENT AND CONSERVATION INITIATIVES**

### **1. Introduction and Regional Context**

Solomon Islands is an independent island archipelago situated east of Papua New Guinea and northeast of Australia in the north west corner of the South Pacific. The island archipelago stretches over an 860 km distance in a northwest southeast direction. To the east Solomon Islands shares a border with Vanuatu. To the west is the island of Bougainville which is a semi-autonomous province of Papua New Guinea. The Solomon Islands is ethnically Melanesian, though there are strong pockets of Polynesian, in the outlying outer islands e.g. Rennell Bellona Province and settlements of Micronesians, e.g. Wagena in the Choiseul Province.

The WWF Solomon Islands Forestry Strategy states:

'The Bismarck and Solomon Seas boast the highest diversity of saltwater fish and coral species in the world. Reef fish diversity and abundance is increasingly being seen as connected to the health afforested streams.

The marine areas of the Solomon Islands are part of the Bismarck Solomon Seas Ecoregion (BSSE), one of the richest marine areas of the world. A Rapid Ecological Assessment conducted by TNVC in 2004, indicated that Solomon Islands has the second highest diversity of coral species in the world after Raja Ampat in Indonesia. Over 494 coral species were found with several new species discovered. The BSSE also has high levels of fish biodiversity with 1019 different species noted in this same survey.

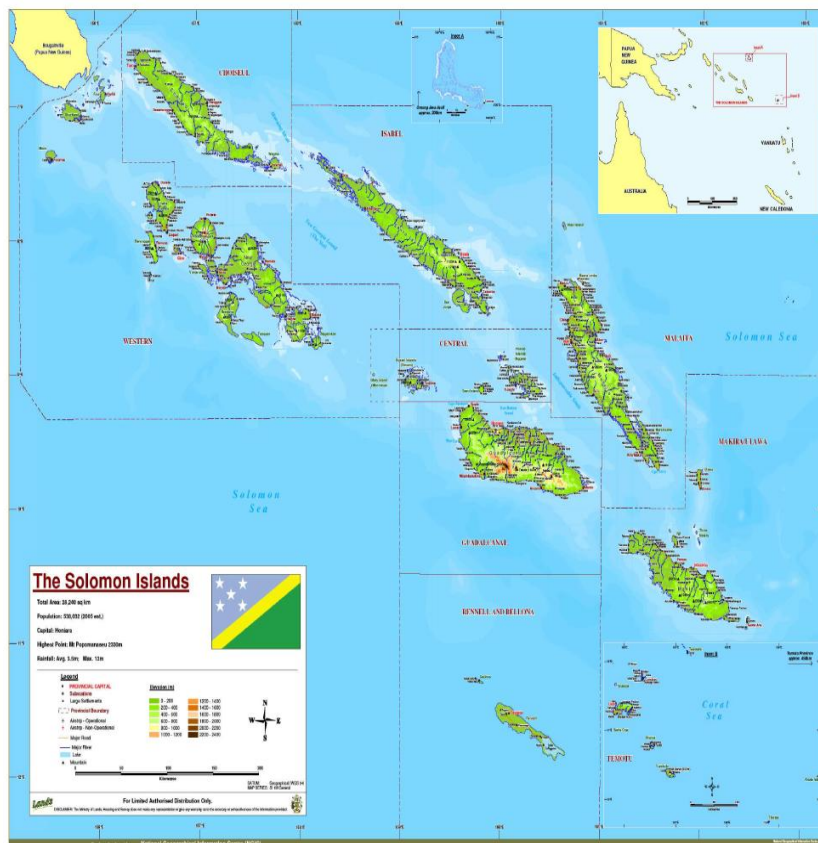
The Solomon Islands has a total land area of 28,450 sq km, but its exclusive economic zone covers some 1.3 million sq km, hence the importance of the marine environment. The island group consists of a double chain of six major islands and more than 990 smaller islands, atolls and cays. The six major islands as well as other larger islands are mostly rugged and mountainous and were naturally covered with tropical moist rainforests, large areas of which having been logged or proposed for logging.

Throughout the South Pacific, selective logging has been used by successive governments and communities as a means to provide infrastructure to rural areas, particularly roads and bridges in the name of rural "development." Typically this type of "development" is both environmentally and sociologically damaging; bridges in are constructed of logs and collapse once the logger moves on. Peripheral damage to the residual stand caused by felling and extracting complete log lengths is excessive and environmental damage is exacerbated by re-entry logging (logging an area before it has had time to recover from the previous logging operation).

There are dire predictions for the Solomon Islands economy if the current rate of logging continues, with recent estimates<sup>14</sup> that natural forests wood flows would start to decline in 2010 and be exhausted by 2015, at the current rate of logging which is 1 million cubic metres per year. In the first quarter of 2007 log export figures of 373,000 cubic metres have been recorded which indicates a potential for 1.6 million cubic metres harvest for 2007 thus bringing forward the date by which all Solomon islands natural forests will have been logged and generating an income gap for the government as currently 65/70% of foreign exchange earnings comes from log exports.

There are even proposals to commence logging in the Rennell Island which is entirely a "Karst" landscape and there very susceptible to environmental damage and degradation should such proposals succeed.

**SOLOMON ISLANDS MAP**



The smallest islands range from coralline atolls to bare sandy islets. The major islands are mostly of volcanic origin. The islands form part of the Pacific 'Ring of Fire', seismic activity including earthquakes is common occurrences and there are active volcanoes.

As the islands are within the equatorial region, the climate is typically tropical with relatively high and uniform temperature all year round. There is high humidity and abundant rainfall of 3500-5000mm per annum. Most of the country normally experiences dry conditions from May to around October when the southeast trade winds blow. The northwest wind trade blows from November to April and is associated with high rainfall, strong winds and cyclones.

## 2. The Terrestrial Environment

Most of Solomon is covered by tropical moist forest. Recent estimates established that 85 % of the country is naturally covered by forests. The vegetation basically comprises grassland, swamps, lowland rain forest, montane forest and secondary vegetation. In terms of its richness, Hansell and Wall recorded a total of 3,210 vascular plants and estimated that a total of 4,500 species could be there if unrecorded species are included. Solomon Islands flora is closely related to that of Malaysia. It however has less

families, genera and species. The current information indicates that there is low endemism compared to the country's fauna.

Forests are an integral part of the daily lives of rural Solomon Islanders. It provides them with most of the necessities of life and plays a significant part in their cultural identity. As one villager<sup>5</sup> stated "It is one life-blood of us all, we live in it, use it and are part of it in ways that are fundamental to the sustenance of human survival".

Before the arrival of early colonizers, the forests were intact as Solomon Islanders lived a subsistence lifestyle through traditionally governed independent communities. The advent of early modernization through the arrival of European traders, merchants, Christian missions and early colonizers introduced substantial changes. Early developments saw the conversion of large areas of coastal forests to coconut plantations. More forests clearance or deforestation occurred when early plantations diversified into cocoa plantations.

Hansell and Wall (1976) and Wall et al (1979) mapped the land systems in Solomon Islands. These efforts, which mapped a total of twenty-seven soil groups, found that the soils in Solomon Islands are generally good in structure, well drained and are usually deep. In terms of essential elements, they are quite rich in nitrogen, phosphorus and organic carbon but are relative poor in potassium and magnesium. The most fertile and therefore, most important of all the soil groups is the recent alluvial found only on North Guadalcanal most of which has now been planted with oil palm. The same work by Hansell and Wall also identified other agricultural opportunity areas throughout the country.

The native avifauna (birds), are the most studied group of all faunal groups in the Solomon Islands. It is the most diverse and has the highest level of endemism of all avifauna of all the Pacific Oceanic Islands with approximately 173 residential terrestrial species and 50 other species of sea birds, shore birds and occasional visitors. Almost half the birds are endemic at the species level. According to Birdlife International, Solomon Islands is the largest Endemic Bird Area in the world (Satterfield et al 1998). This still excludes Rennell and Bellona, and Temotu which have separate endemic bird species.

Reptiles are probably the next much studied group of fauna. Their total comes to 61 (excluding sea snakes, turtles and crocodiles). There is greater diversity of reptiles in the Solomon Islands than elsewhere in the Pacific Islands. This may not be the case for endemic species though, which may be higher in New Caledonia. Three of the reptile genera in the country are endemic as well as 25 other species. At least five species are thought to be endangered or extinct.

Terrestrial mammals of Solomon Islands are regarded as one of the World's richest in terms of bats and rats. There are over 52 species, 50 percent of which are endemic<sup>1</sup>. There are seventeen native frogs, which indicate the greatest diversity of frogs of any Pacific Island group. The frogs include three endemic genera. Terrestrial invertebrate information are not adequate except for the butterflies which is believed to number about 130 species Thirty five of these are endemic whilst 54 are shared with Papua New Guinea.

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<sup>1</sup> World Vision representatives at Lata, Temotu islands expressed concern at the amount of damage being done to food gardens by plagues of rats and bats, which have serious food security implications

### 3 The Marine Environment

The Solomon Islands marine and coastal ecosystem is part of the world's largest marine centre of diversity -the Western Pacific. The Solomon Islands coastal zone contains some of the most biologically diverse ecosystems in the world with its estuaries, beaches, mangroves, coral reefs, sea grasses, algal beds and many small island ecosystems supporting a wealth of marine resources. These systems however are relatively unknown. Coral reefs in the Solomon Islands are mainly narrow, fringing and intermittently distributed all around the islands. Their collective biomass is, however, large because of the coastline length of the nearly thousand islands. Long barrier reefs and expansive intertidal reef flats are uncommon though. Ontong Java, a northern outlier, is the only large atoll. The largest coral reef systems are found in the following areas:

- Around the Shortland Islands closer to Bougainville
- Inside barrier reefs along the north eastern shore of Choiseul
- Either side of the Manning Strait between Choiseul and Isabel Islands and extending along the south western shore of Santa Isabel
- New Georgia southern shore covering Gizo and Vonavona lagoon areas
- Encircling the island of Vangunu in south eastern New Georgia along the North eastern coast
- Lau and Langalanga lagoons in Malaita
- Marua sound in east Guadalcanal (Sulu et al)

Even though the status of the Solomon Islands' coral reefs and its biota remains relatively unknown, current lists of known fishes number around 2000. The most recent major work on the marine environment was a marine assessment carried out in 2004, led by some of the renowned scientist in the field from TNC and with support from various organizations including the Government of Solomon Islands, WWF, World Fish Centre, provinces and many communities throughout the country.

The marine assessment states, "the Solomon islands is an area of high conservation value where marine diversity is exceptionally high, marine habitats are in good condition, and current threats are low. The diversity of marine life, condition of marine habitats, and the attractiveness of rainforest-dominated islands combine to create coastal settings seldom seen in today's over-populated and over-exploited world. However there is some concern regarding increasing threats to marine habitats, particularly from fishing and poor land use practices".

The marine survey found that the Solomon Islands has one of the highest diversities of corals in the world with a recording of 494 species in the survey, 485 of which are known and nine still unknown to the experts and may be new species. They stated that this extraordinarily high diversity of coral species is the second highest in the world, second only to the Raja Ampat Islands of eastern Indonesia. The assessment also reported records of 1019 fish species. Marine invertebrate knowledge focuses on the few important commercial or fisheries species and remains largely unknown.

### 4 Protected Areas

Most of the Solomon Islands is not under any formal legal protection and under customary ownership. With the level logging activity in the last few years, hopes of formally protecting the many unique forested areas of the country is fast disappearing. The common problems of resources scarcity (human

resources and funding), low capacity levels and institutional weaknesses are reasons given for the lack of establishment of protected areas.

Efforts regarding establishment of protected areas are ongoing with the assistance of donors and international and national NGOs. Current efforts in protected areas development in Solomon Islands are not so much based on what types of protected areas to be developed but are emphasized more on community based, the community managed conservation area approach.

The following areas are existing protected areas:

#### ***4.1 Arnarvon Islands Marine Conservation Area***

This area was initially established as the Arnarvon Island Turtle Sanctuary under an Isabel Province ordinance but was subsequently abandoned following the burning down of the islands facilities by original landowners. It was re-established as the Arnarvon Islands Marine Conservation Area under an improved Isabel provincial ordinance and a new management plan. The re-establishment of the conservation area was the result of an excellent partnership between the government, The Nature Conservancy and the communities of Posarae and Wagena in Choiseul province, and Kia in Isabel province.

#### ***4.2 Queen Elizabeth Park***

This area is just south of Honiara and is commonly known as Mount Austin. It was declared a national park under the National Parks Act in 1954. The park has not been under any proper management and has been totally degraded by local people who claim ownership of the area, and other settlers from nearby settlements on the outskirts of Honiara. One informant stated that much of the firewood, largely *Pometia pinnata* (local name "aqua") sold at the Honiara market is taken from this reserve

#### ***4.3 Kolombangara Ecological site***

A strip of forest which runs up to the summit of Kolombangara was reserved as an ecological site but has since been selectively logged. Its current ecological status is undetermined.

#### ***4.4 Bird sanctuaries -(Tugali, Dalakalau, Dalakalonga, Oema and Oema atoll)***

Under a piece of colonial legislation known as the Wild Birds Protection Act, a number of small islands were declared bird sanctuaries. Most of these are in the Florida Islands and Western province. Most of these have also been degraded by poachers and are considered defunct<sup>2</sup>

#### ***4.5 East Rennell World Heritage site***

The Solomon Islands have the honour of hosting the first World Heritage site in the insular Pacific through East Rennell which was accepted as a World Heritage site. The effort now should be focusing on sorting the management issues relating to the site as there is pressure to log adjacent primary rainforests despite the obvious low commercial volumes<sup>3</sup> and environmental sensitivity of the landscape.

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<sup>2</sup> Horokou pers comm..

<sup>3</sup> Personal observation from hours of walking on the Island.

#### ***4.6 Komarindi Catchment's Conservation area***

The Komarindi catchment is an important catchment area for the previously proposed Lunga hydropower development to serve Honiara. The area is a large area north west of Honiara and is currently under some long term lease arrangements between the government and the land trustees of the area.

#### ***4.7 Makira Highlands Conservation Area***

Situated in the central Bauro highlands of Makira, this is a large area developed by CI and the Makira Conservation Foundation for conservation. The programme has also ventured into ngali nut (*Canarium spp*) oil production as an alternative livelihood programme for the local people.

### **6 Key Environmental NGOs and their Areas of Activities**

A number of environmental Non Government Organisations have played key roles in advocating and promoting the environmental agenda in Solomon Islands. Whilst most of them are international NGOs, national NGOs have also contributed significantly to the same environmental cause. The work of the NGOs has supported the work of the government and fills the gap where there are no government interventions. The NGOs are mostly working at the grassroots and community level and have made greater inroads at the community level than the government. The following NGOs are currently active in Solomon Islands.

#### ***6.1 WWF -The World Wide Fund for Nature (WWF) Solomon Islands***

The WWF has been active in the Solomon Islands since the eighties and has been focusing most of its work in the Western province. In the nineties, WWF implemented an integrated community development and conservation programme promoting the development of marine protected areas and alternative livelihoods. They have assisted local communities to develop local protected areas. They have also played the lead role in the current efforts at Tetepare Island which is the largest uninhabited island in the South Pacific. They have also worked on the Bismarck Solomon Seas Ecoregion programme which is basically a marine oriented programme.

#### ***6.2 The Nature Conservancy (TNC)***

TNC is the NGO that has taken on the key role of re-establishing the Arnarvon Islands Marine Conservation Area (AMCA) in partnership with the government and the local communities of Choiseul and Isabel provinces. The AMCA to date is the most successful conservation area project in the country and is being used as a model to promote the establishment of other conservation areas. TNC's work is basically on the marine environment and currently focuses on Choiseul and Isabel provinces. The organization also targets capacity building for traditional community leaders to strengthen management and decision making in the community in relation to its programmes. TNC's programme in Solomon Islands is based in Honiara.

#### ***6.3 Conservation International (CI)***

CI is the only international NGO that currently focuses on the terrestrial environment. Its main project in the country is the Central Makira Conservation area which is a large area in the Bauro highlands of Makira. CI's work in Makira has also focused on alternative livelihoods especially on the production of

Ngali nut oil for export. CI's work in Makira has been done through a local partnership with the Makira Conservation Foundation. CI has an office in Honiara.

#### **6.4 Others**

Other NGOs which are still active in environment and conservation issues are Greenpeace, Foundation of the Peoples of the South Pacific International (FSPI), Solomon Islands Development Trust (SIDT), Environment and Conservation Action Network of Solomon Islands (ECANSI) and many others which are based in the provinces.

## CHAPTER 5

### THE POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND RISKS OF RDP II INVESTMENTS

The environmental impacts of Component 3. Project Management and other subcomponents on training, capacity buildings etc. are negligible. Therefore, this Chapter discusses about the potential impacts and risks of RDP II physical investments in Components 1 and 2.

#### 1 Type of Interventions

The potential impacts and risks of a subproject depends on the kind of physical interventions caused to the existing environment during both construction and operation phases. The types of structures that RDP II may provide under Components 1 and 2 include:

- community buildings, such as community halls, women resource centre, schools, nurse aid posts, maternity ward, market building, solar charging station etc.
- water supply systems, including rainwater and gravity-fed piped water supply systems
- foot bridges and piers,
- sanitation facilities
- agricultural production, farming, and product processing

The source /the causes of the impacts are the physical activities to be carried out during construction and operation phases. These are listed in Table 3 below

**Table 2 – The types of physical activities financed by RDP II**

Component	Facilities/services provided	Physical Activities	Operations
1 Small scale basic infrastructure	<ul style="list-style-type: none"> <li>- Building structures, community halls, resource centre, schools, market houses, aid posts, maternity ward, nurse aid posts, solar charging stations</li> <li>- Transport: access path, foot bridge, pier</li> <li>- Water Supply: rain water, piped water</li> <li>- sanitation facilities</li> </ul>	<ul style="list-style-type: none"> <li>- Site clearance</li> <li>- Mobilisation of construction tools, equipment, vehicles, plants, materials, workers</li> <li>- Concrete mixing, materials preparation</li> <li>- Excavation, back fill</li> <li>- Building, construction</li> <li>- Installation</li> <li>- painting</li> </ul>	<p>Natural resources such as water is used</p> <p>Energy/fuel supply is need</p> <p>There is safety risk during operation</p> <p>Waste and wastewater will be generated</p>
2. Agriculture Agricultural production,	<p>Training on farming techniques</p> <p>Pilot models</p>	<ul style="list-style-type: none"> <li>- Cultivation</li> <li>- Raw materials processing</li> </ul>	<p>Resources are used</p> <p>Products are created, harvested</p>



farming, product processing		- livestock/animal husbandry	Processing Transportation Etc
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### 3. Potential Impacts and Risks

As the above-mentioned investments aim to provide better access to basic services to local communities and improved agricultural practices and productivity, the main impacts would be positive:

- Improved access to education
- Improved access to health care
- Improved access to electricity
- Improved transport by land and by sea, allowing access to services and economic opportunities
- Better water supply with access to more, cleaner water for various domestic uses, and save a lot of labour works and time spent on getting the water to home
- Improved sanitation facilities included with community infrastructure

Beside the positive impacts, construction and operations of the proposed facilities will have some potential negative socio-environmental impacts and risks. The objects that may be affected by construction or operational activities under RDP II could be:

- The air environment: dust, noise, odour, vibration
- Water bodies: changes in turbidity, sediment, dissolved and undissolved pollutants coming into water
- Soil, land: erosion and wastewater
- Biological resources: grass/vegetation cover, shrubs, trees, plants, animals, insects, pest, forest, etc.
- Landscape, topography: slopes, hills, mountains, valleys, water falls
- cultural objects, structures such as monuments, statues, graves, artefacts, sacred trees, temples, church etc.
- Existing facilities at the site, such as houses, roads, water supply, drains, etc
- Human beings with social settings, economic/production activities
- etc.

**Table 3 – Potential negative impacts of the works under RDP II, Components 1 & 4**

	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause the potential impacts/risks
	<b>CONSTRUCTION PHASE</b>		
1.	Damages or loss of vegetation cover and trees	Vegetation cover and/or trees at the construction site or any other location to be used by the Project may be removed or disturbed during construction phase. This impact can be avoided, minimised or mitigated.	<ul style="list-style-type: none"> <li>• site clearance for construction site, camps,</li> <li>• construction material exploitation and/or storage</li> </ul>
2.	Loss or degradation of valuable natural/ ecological resources	<ul style="list-style-type: none"> <li>• Coral should be protected, not extracted as this is a valuable marine resource. It grows very slowly and it takes a long time to recover from damages. Coral reefs protect the shoreline from wave actions and storms, it is habitat from great variety of fish and marine life, is breeding ground for fish and shellfish.</li> <li>• If sand, gravel and stones from river bed is extracted, flowing pattern of river may be seriously affected. The river may scour around bridge piers and abutments and endanger their stability. The river may erode other sections of the river beds and banks and thereby cause serious problems elsewhere</li> <li>• Illegal timber may be logged without a licence, in protected area, or logged without sustainable manner. Such practices lead to permanent loss of forest</li> <li>• Sourcing Timber from a logged area encourages unsustainable resource harvesting practices".</li> <li>• If timber is sourced from trees of high economical values to local community, household income or food security of families may be at risk.</li> <li>• Protected areas, wetland, mangrove area, swamp, bird sanctuary, sea grass beds are important to biodiversity and earth and may also have valuable landscape.</li> <li>• Some sites may be very important to local communities in cultural/religious/historical/archaeological aspects.</li> </ul>	<ul style="list-style-type: none"> <li>• Site clearance</li> <li>• Construction</li> <li>• Extraction natural resource for construction materials at important sites particularly corals from sea, trees from protected area, gravel from river beds etc.</li> </ul>

	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause the potential impacts/risks
		<p>If construction takes place at or nearby such sensitive socio-environmental features, threats or serious/ permanent damages may be caused to such sites.</p> <p>Human access to undisturbed area may cause damages to (from plant collection/removal, wildlife catching, hunting, fire setting, littering etc.) damage to vegetation cover as habitats of wildlife or cause fire risks</p> <p>Such potential high impacts should be identified in early stage of sub-project planning and avoided in RDPII.</p>	
3.	Degrade existing landscape	This impacts may occur when vegetation cover/top soil is removed, or a man-made structures are introduced into least disturbed nature, or when new structures obstruct view to existing beautiful landscape	<ul style="list-style-type: none"> <li>• Site clearance</li> <li>• Construction of new facilities in areas with beautiful/valuable landscape</li> </ul>
4.	Solid Waste generation	Excavation works generate waste Waste is also be generated from unused materials: timber/glass/metal, packaging materials or by the workers: lunch containers, leftover food etc.	<ul style="list-style-type: none"> <li>• Excavation</li> <li>• Construction</li> <li>• Workers daily domestic activities</li> </ul>
5.	Wastewater generation	Wastewater generated by workers from washing and toileting. Uncontrolled generation of wastewater may cause environmental pollution, nuisance, and health concerns to workers and the public	<ul style="list-style-type: none"> <li>• Excavation</li> <li>• Use of construction materials</li> <li>• Workers domestic activities at the sites</li> </ul>
6.	Chemicals, hazardous wastes generation	Used Oil, paints, lubricant, batteries, and asbestos-containing materials are toxic. Some of the solid waste may be cross-contaminated with oil, paints etc. that may be toxic and pose public health risk	<p>Site clearance</p> <p>Vehicle maintenance</p> <p>Painting</p>
7.	Dust, air pollution	Exposure to high level of dust and smoke may have health impact: affect respiratory system, eyes	<p>Site clearance</p> <p>Excavation</p> <p>Running engine Machinery</p> <p>Construction material loading and unloading</p>
8.	Noise and Vibration	Noise disturb hearing/listening activities and may cause stress/headaches Vibration may cause cracks /damages to existing structures	<p>Pile driving</p> <p>Soil compaction</p>
9.	Increased erosion risks/siltation/	Slopes become less stable when ground surface is disturbed; water can run faster	<ul style="list-style-type: none"> <li>• Site clearance</li> <li>• excavation activities</li> </ul>

	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause the potential impacts/risks
	sedimentation	and can erode the soil on bare slope where vegetation cover does not exist. Therefore, erosion, land slide risks would be increase if a building is located on a hilly slope or construction activities disturb slopes. The eroded top soil will ends up at down slope then being wash down further by rain water causing highly turbid water and river bed/stream siltation/sedimentation	<p>create unsealed/barren area without vegetation cover during and after construction</p> <ul style="list-style-type: none"> <li>• Construction works carried out on steep and/or weak slopes</li> </ul>
10.	Water quality degradation, salinity intrusion risks	<p>Waste and wastewater, construction materials from construction may be leaked or disposed of into water sources nearby construction sites or downstream of construction sites.</p> <p>Water quality in streams and rivers may also be degraded if soil from slopes in the catchment run into water bodies due to erosion/landslide initiated by earthworks at the sites.</p> <p>Careless water use activities by workers, for example washing working tools directly at water sources.</p> <p>Oil, fuel or any other liquid substance used during construction, including on-site machinery maintenance, may be leaked or spilled into the soil. Then rainwater may wash such contaminant to nearby water bodies</p>	<ul style="list-style-type: none"> <li>• Construction of bridges, pier on streams, river beds</li> <li>• Construction waste and waste water discharge</li> <li>• Tools and machinery washing and maintenance</li> </ul>
		When freshwater is extracted from a drilled well near a shoreline, localised water level drawdown will occur. If the salt-fresh water interfere is located nearby the well or groundwater is over withdrawn, saline water may be mobilised into the well	<ul style="list-style-type: none"> <li>• groundwater extraction during construction phase</li> </ul>
11.	Increase localised flooding risk	The area surrounding the area disturbed by construction activities may be subjected to increased flooding risk if large loads of solid construction materials/waste are created in low-lying area where drainage is poor	<ul style="list-style-type: none"> <li>• Construction solid materials and waste loading, dumping</li> </ul>
12.	Impacts Cultural sites such as church, historical site, grave yard, etc.	<p>Cultural sites may be affected with dust, noise from material and waste loading/disposals</p> <p>Some artefacts may expose during execution of earthworks at the sites</p>	<p>Dust and noise generated activities</p> <p>Loading/unloading construction materials and wastes</p>
13.	Social disturbance to local community:	If the works are carried out on or near existing road, construction activities may	<p>Site clearance</p> <p>Excavation</p>

	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause the potential impacts/risks
	<ul style="list-style-type: none"> <li>- traffic/ transportation</li> <li>- water supply</li> <li>- irrigation</li> <li>- farming</li> <li>- Community meetings events/ etc.</li> </ul>	<p>disturb or disrupt traffic on the existing roads.</p> <p>Excavation may also cause loss to vegetation cover or disturbance to the ground</p> <p>Excavation works may disrupt the operations thus the services provided by local existing facilities such as water supply, drainage, power supply etc. if the pipes/lines cross excavated areas</p> <p>Stockpiles formed from excavated materials</p> <p>If construction activities takes place near farming area, access to farm land may be interrupted; materials, waste, and wastewater from construction sites may enter farms causing productivity reduction and social conflicts</p> <p>If a construction site is located near community centre of church, material loads or noise from material cutting, drilling, welding, may block access to community centres or disturb hearings in public meetings.</p>	<p>Machinery operation</p> <p>Temporary blockage of rivers/streams/ existing irrigation canal for construction</p> <p>Temporary block of road for construction of connection section to new alignment</p>
14.	Health/ sanitation /hygiene in local community	<p>stagnant water formed from disturbed area at construction site is favour for mosquito breeding, which is a vector of water-borne diseases</p> <p>Waste generated from workers staying at the site may attract vermin and insects</p> <p>Wastewater generation may cause nuisance and health risks to human</p>	<ul style="list-style-type: none"> <li>• Excavation create holes or low laying spots</li> </ul>
15.	Safety risk to community	Construction-related activities may cause safety risks for local community, particularly children if they access to open holes or present at the site during materials transports/loading/unloading.	<p>Transportation of materials/wastes</p> <p>Materials loading/unloading</p> <p>Excavated holes</p> <p>Machinery operations</p>
16.	Workers health and safety	<p>Some toxic materials such as paint, oil, battery may be used during construction. Some construction materials may contain asbestos.</p> <p>If workers are in contacts such materials without proper protection, health hazard may be resulted from the handling, breathing from such materials.</p> <p>Unprotected holes at the sites, exposure to traffic at road side, improperly installed electrical wires, operating and handling of</p>	<p>General construction activities, operations of tools and plants in contact with hazardous substances such as paints etc.</p>

	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause the potential impacts/risks
		construction plants, machinery and tools may cause safety risks to workers	
	<b>OPERATION PHASE</b>		
1.	Water/soil pollution	Leakage or discharge of wastes and wastewater generated from the facilities provided	Water use activities taking place at buildings/ shelters
2.	Water/soil pollution	Effluent from septic tank can pollute groundwater or surface water, particularly if piped to an open drain Partly treated effluent from septic tank can easily pollute the groundwater in the dug well, even after many years; Polluted surface water from around the septic tank may percolate into the groundwater	Sanitation facility
3.	Visual impacts	if the facility outstand in public area and degrade the surrounding landscape value	Sanitation/ drainage facilities
4.	Nuisance, odour, Unhygienic condition, public health risks	Septic tank effluent is smelly thus may cause nuisance to the public when being felt/seen Septic tank effluent is only partially treated thus can spread infection and disease thus pose health risk. Lack of proper drain around public taps create muddy mess around the tap or in the yard. Standing water become mosquito breeding ground and cause inconvenience for water users Open or missing facet can spill a lot of water in a day. Valuable water that other users may need is wasted	Sanitation
5.	Pollution caused by hazardous wastes	The operation of some types of infrastructure provided by RDP may generate hazardous waste such as used batteries at solar charging station, or medical wastes at healthcare centres.	Solar charging stations Health care buildings
6.	Unhygienic condition, public health risks	Muddy condition/siltation at public tap lead to unhygienic conditions and/or mosquitoes breeding	Water supply
7.	Conflict with downstream water demands	When inflow water is partly stored at upstream of a water source by one group of water users, other groups may have less access to the water they need and that may	Water supply

	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause the potential impacts/risks
		need to social conflict between different community groups.	
8.	Weather extreme events/natural disasters such as storms, cyclone tsunami.	Weather extreme events or natural disasters can damage the facilities provided by the project or interrupt the services provided by these facilities. In some cases, weather extreme events such as cyclones may not directly cause damages to the facilities but damages the objects in the surroundings and these objects cause damages to the facilities provided by the Project, for example tree fallings into water towers	Cyclones Tsunami torrential rain

The main social and environmental concerns of the investments in Component 2 would relate to raw materials, waste and wastewater generated in the businesses and farms supported by RDP II.

With support given to farming, the raw materials used in agriculture for pest control, particularly pesticide would be the main concerns of RDP II. There are health risks to humans and the environment during the production, packaging, transport, store, handling, usage and disposal of pesticide.

With investments in agricultural business, waste and wastewater may be generated during processing

The impacts and risks associated with Components 1 and 2 will be addressed through the procedures described in Chapter 6 of this ESMF

## CHAPTER 6 SOCIAL & ENVIRONMENTAL MANAGEMENT FRAMEWORK

### 1 Overview

The RDP II has been designed to finance the construction of small-scale infrastructure under Component 1 and support small-holders agricultural activities under Component 2. The RDP II has been classified as Environmental Category B in accordance with World Bank Safeguard Policies, i.e. most of RDP investments are at small scale, the associated potential negative socio-environmental impacts and risks should be small and localised and manageable. The RDP II will not finance activities that may cause adverse unmanageable socio-environmental impacts.

### 2 Social and Environmental Management Procedures

This ESMF is a tool for RDP II to avoid, mitigate or address the potential social and environmental impacts and risks associated with the proposed investments. The ESMF introduces four steps to be followed for managing the impacts and risks of proposed investments under Component 1 with timing and implementation responsibilities summarised in Table 4 below. Section 3 will give detail technical instructions on how to implement each step. Safeguard Procedure applied to Component 2 investments will be discussed under Section 4 of this Chapter.

### 3 Four steps of Safeguard Procedures for Component 1

**Table 4– Four steps of safeguard procedures**

Step #	When to implement	Who to implement	Who check/verify
#1 Screening for Eligibility of Subprojects*	Subproject short listing	Provincial Government Leader	The Environmental Officer (EO)
#2 Site assessment, Screening for Impacts and Risks	Site selection	Community Helpers	The Environmental Officer
#3 Select mitigation measures	Sub-project Preparation	Engineer/ Community Helpers	The Environmental Officer
#4A Implement mitigation measures	Design	The Benefited Communities , community helpers, The Engineer	The Environmental Officer
	Construction	The Contractor	The Community Helper The Engineer, the EO
	Operation	The Benefited Communities	The EO
#4B Monitoring, supervision	All stages from engineering design to operation	Community Helpers, The Engineers The Benefited Communities	The Environmental Officer



#4C Reporting	All stages from engineering design to operation	CHs, The Engineers, The Benefited Communities	The Environmental Officer
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\* after screening for eligibility, only eligible subprojects will be proceed to steps 2 to 5. Proposals of ineligible subprojects will be modified to make the subproject become eligible, then follows steps 2 to 5. Alternatively, unmodified ineligible subproject will not be financed by RDP II

#### Step 1 – Screening sub-projects for eligibility

The purpose of this step is to exclude subprojects that may have adverse social or environmental impacts and risks that may not be manageable under RDP II. Exclusion of subprojects are based on the World Bank Safeguard Policies and the capacity of RDP II to address the potential social and environmental impacts and risks.

#### Step 2 – Site assessment, Sub-project Impacts and Risks assessment

The purpose of site assessment is to record the characteristics of the sites and assess the related issues and risks that the subproject will have to face during construction and operation phase. Based on site characteristics, the types of physical activities to be carried out during construction phase, the facility-specific operational features, the potential impacts and risks of a subproject will also be identified and assessed in Step 2 so as mitigation measures can be proposed accordingly in Step 3.

#### Step 3 –Select mitigation measures

The purpose of this step is to identify the mitigation measures to be applied during construction and operation phases of a subproject

#### Step 4 –Implementation of mitigation measures; monitoring and supervision and reporting

##### Step 4A – Implementation of mitigation measures

The purpose of this step is to avoid, address, manage or mitigate the potential impacts and risks that may happen during the construction and operation of the proposed investments through the application of the mitigation measures proposed in Step 3 in engineering design and construction practices.

##### Step 4B – Monitoring and supervision

Monitoring, supervision and reporting should be carried out during the design and construction phase to ensure that the potential impacts and risks are avoided, mitigated or addressed on time. Timely monitoring and supervision allows the project proponent to timely address any issues arisen during construction/operation phase. Monitoring also help to draw lessons for future similar subprojects.

##### Step 4C –Reporting

Monitoring information should be recorded for reporting purpose.

### **3.1. Step #1      Screening for Eligibility of Subprojects**

The RDP II has been classified as Environmental Category B by the World Bank. Most of the potential negative impacts should be localised, short term and manageable. The Bank would not finance any subprojects that may have irreversible adverse environmental Impacts. The Bank also has an exclusion list of certain area that the Bank would not finance such as politics, military, sectors that involve addictive substances such as tobacco, brewery, kava etc.

Therefore, a Screening Form has been developed for excluding Component 1 (community infrastructure or services) and Component 2 (agricultural partnerships) subprojects that may have adverse socio-environmental impacts or noncompliance with the Bank Safeguard Policies. When a subproject is proposed, the Community Helper (in the case of Component 1) or Lead Partner (in the case of Component 2) will answer the questions listed in **FORM I, which is commonly used for both components 1 and 2**. Then the Forms should be reviewed by RDP II Environmental Officer

## RURAL DEVELOPMENT PROJECT II

### FORM 1: SOCIO-ENVIRONMENTAL ELIGIBILITY SCREENING

Filled in by CHs with input from Provincial Team Leader (in the case of Component 1), or by the Lead Partner (in the case of Component 2), and checked and verified by the Environment Officer

**Sub-project/partnership name:**

**Component 1 or 2**

☐

**Location Village and Province:**

When a sub-project is proposed, answer the questions below:

	Questions	Yes	No	Comments/Notes
	<i>Will the sub-project/partnership.....?</i>			
1	Involve political activities?			
2	Involve religious activities such as building, upgrading or maintenance of a church?			
3	Involve in the business of dealing with addictive materials production or processing such as tobacco, brewery, kava, betel nuts, etc., including promoting the production or consumption of these products			
4.	Involve military, security services or police?			
5	Acquire forest land**, or convert existing forest land to agricultural land?			
6	Acquire land in legally protected areas such as Conservation Area, wildlife management area or National Parks?			
7	Cut down food trees, fruit trees of small island communities for timber as community contribution			
8	Acquire land in Protected areas or exclusion area defined by the Environmental Act 1998 *			
9	Lead to spreading of invasive weeds?			
10	Acquired or cause irreversible changes to seasonally inundated land, e.g. swamps, mangroves forest?			
11	Cause damage or removal of known existing cultural heritages such as temple, ancient graves, sacred trees, or any other objects of spiritual valuable to			

	local communities?			
12	Focus on large block-holder or plantations, except when they are used as a base to the delivery of extension, processing and marketing services to surrounding smallholders and benefits to smallholders can clearly be established.			

\* Areas identified as Protected areas by the Environmental Act 1998:

- Declared as Conservation Areas under legislation
- That have ecological or scientific importance including outer reef and lagoon islands, swamps, wetlands and mangrove which are vital to the protection of important marine resources
- That ground elevation exceed 400 m above sea level
- That landowners do not wish to log for any reason

\*\* Forest – Definitions by OP4.36 – Forest of the WB Safeguard Policy:

- Is and area of land not less than 1.0 hectare with tree crown cover (or equivalent stocking level) of more than 10 per cent that has trees with the potential to reach a minimum height of 2 meters at maturity *in situ*;
- May consist of either closed forest formations or open forest
- Includes young natural stands and all plantations that have yet to reach a crown density of 10 percent or tree height of 2 meters
- include areas normally forming part of the forest area that are temporarily unstocked as a result of human intervention – but that are expected to revert to forest

Conclusion:

A. ALL of the answer are “No”, thus the sub-project is ELIGIBLE ☐

B. At least one answer is “Yes”, details in subproject proposals such as the type of investments, the locations etc. has been modified to make all the answers become “No”. Therefore, the modified subproject is ELIGIBLE ☐

C. At least one answer is “Yes”, the subproject proposal can not be modified, the subproject is INELIGIBLE. ☐

NEXT STEP:

The subproject is eligible, proceed to Step 2 ☐

The subproject is ineligible, remove the subproject from RDP II

Prepared by: \_\_\_\_\_ Check/verified by \_\_\_\_\_  
 (Name, position)  
 Date: \_\_\_\_\_ Date: \_\_\_\_\_

### 3.2 Step #2 –Site Assessment, Screening for Impacts and Risks

#### 3.2.1 Site Assessment

All of the tasks to be carried out in step 2 are for identifying the potential socio-environmental impacts and risks that may occur during the construction and/or operations of the subproject.

Before carrying out site assessment and screening for impacts and risks, it is important to recognise the objects potentially affected and the sources of impacts and risks

#### RURAL DEVELOPMENT PROGRAM II

#### FORM 2 : SITE ASSESSMENT

Filled in by CHs with input from Provincial Team Leader(in the case of Component 1), or by the Lead Partner (in the case of Component 2), and checked and verified by the Environment Officer

**Sub-project/partnership name and brief description:**

**Component (1 or 2)**

☐

**Location Village and Province:**

Observe the sites and answer the questions below

	Questions	Yes	No	Notes/Comments
1. accessibility, Topography	A. Is site located on a slope or in a hilly area made of soft/loose formations that has high erosion/ landslide potentials?			
	B. Is the surroundings of the site vulnerable to erosion, landslide risks that may affect the stability of the facility to be built?			
	C. Is the project site located in flood plain areas or in located in area at low elevation above sea level so as it is at risk of inundation in the long term?			
	D. Is the existing ground level lower than historical flood level?			
	E. Is the ground where construction will take place lower than the surrounding that rain water may concentrate and cause flooding easily?			
	F. Is it safe and easy to access the site in rainy weather			
	G. Others (specify)			
2. Biology	A. Is there any vegetation cover that may be disturbed or cut down? Cycle if these are: grass / shrubs / big trees / others			
	B. Is the site located on any crop land?			
	C. Are there any food trees that belong to individual households that may be cut off?			

	D. Is it possible that any wildlife or insects that may attack human such as snakes, bees, fire ants, etc. will be present at the site			
	Others biological characteristics to be noted (Specify)			
3. Climate, hydrology	A. Is the site located within 100 m from a river bank, or within 50 m from a log pond			
	B. Has the area undergone severe drought in the most recent five years			
	C. was the area severely affected by thunderstorm and lightening before			
	D. Earthquake happened in this area before?			
	E. Others climatic characteristics to be noted (Specify)			
4. Culture	A. Is there any sacred tree that may be affected?			
	B. Is there any grave within 50 m from the site			
	C. Is there any Statues within 50 m from construction site?			
	D. Are there any other objects/structures of spiritual importance to local communities that may be affected by construction or operation phase?			
	E. Others cultural characteristics to be noted (Specify)			
5. Existing facilities	A. Are there existing natural drains at the site?			
	B. Are there any existing water pipes crossing the site			
	C. Is there existing road that may be excavated or damaged during construction			
	D. Are there any animal cages within 10 m from the site			
	E. Are there any houses within 20 m from the site?			
	F. Are there any existing toilet/sanitation facility in the area			
	G. Is there existing water supply facilities? If yes: piped / rainwater/ dug well ?			
	H. Others existing infrastructure to be noted Specify)			
7. Natural Resources	A. Will the use of water, energy during construction and/or operation phase cause restriction access to some communities			
	Others natural resource characteristics to be noted (Specify)			
8 Lan	Permanent acquisition of private land			
	Temporary Acquisition of private land			
9.	<b>photos taken at the site, notes to demonstrate the conclusions made on Y/N</b>			

### 3.2.2 Impacts and Risks Screening

Screening should be carried out soon after Site assessment has been done, screening for impacts should take into account the site characteristics noted in the site assessment form

The information recorded in Form 2 is very important as it helps subproject proponents to identify the site-specific issues and risks, so as in Step 3 he/she can identify the mitigation measures and incorporated into Component 1 or Component 2 subproject design.

#### Impacts Screening for COMPONENT 1

RURAL DEVELOPMENT PROGRAM II				
FORM 3 : IMPACTS SCREENING				
For component 1 infrastructure				
Filled in by CH with input from the Engineer where possible, checked and verified by the EO				
<b>Sub-project name and brief description:</b>				
<b>Location Village and Province:</b>				
Community Helpers should fill in this form after site visit.				
Subject	Screening Questions	Yes	No	Comment
<b>CONSTRUCTION PHASE</b>				
	<i>Will the subproject:</i>			<b>(guidance are given below)</b>
1. Vegetation cover, trees, insects, animal	Remove vegetation cover, cut down trees for timber or site clearance?			<i>Specify the number and the type of trees to be cut down</i>
	Affect crop land with waste and wastewater?			<i>Assess if waste and wastewater generated during construction affect existing crops</i>
	Disturb wildlife, insects such as snakes?			
2. natural resources	Be located near forest or least disturbed /nature reserve area?			<i>Estimate the distance</i>
3. Landscape	Cause significant changes to, or negatively affect the landscape of the area?			<i>Describe the nature of change, e.g. from green site to concrete/ wooden structures, dumps created in green area,</i>
4.Solid waste	Generate solid waste such as excavated soil, unused materials			<i>List the type (and quantity if possible) of solid waste potentially generated</i>
5. Hazardous wastes	Generate hazardous waste such as batteries, unused paints, oil, lubricant etc.			<i>List the type (and quantity if possible) of solid waste potentially generated</i>
6.Wastewater	Generate wastewater from the site?			<i>List the types of activities (eg.</i>

	e.g. lubricant etc.			concrete mixing, tools washing etc.) that may generate waste water and quantity.
7. Dust and smoke	Cause increased dust level at the site, or generate smoke			Identify the sources, e.g. barren soil, disturbed ground, solid waste dumped at the sites, sand, gravel loaded at the site etc.
8. Noise and vibration	Generate high noise and vibration			Identify the sources, e.g. drilling, pile driving, steel/timber cutting and the time that noise/vibration lasts Describe the distance from the nearest house to noise sources
9. Erosion risks	Disturb slopes?			Describe the construction site, status of vegetation cover and the level of interference by the project. Consider rainfall during construction phase
10. Water quality	Cause water pollution by construction waste and materials loaded at the construction site			Estimate the type and quantity of materials loaded at the site at a time, the distance from construction site to the nearest water bodies and topographical condition
11. Local flooding	Increase localised flooding risk by temporary/permanent loading of construction materials/wastes			Describe site topographical condition, drainage and estimate the maximum quantity of granular construction materials loaded/exist at the time at a time
12. Water quantity	a. Withdraw groundwater in coastal area that may lead to the risk of salinity intrusion			estimate the nature of water use by the project
	b. Extract or use large amount of water in local river/streams may cause shortage to water supply to other users in the locality?			estimate the nature of water use by the project
13. Social disturbance	a. Disrupt local traffic/ transportation/ pedestrian traffic			
	b. Disrupt the operation of local water supply system			
	c. Disrupt the operation of local irrigation system			
	d. Disrupt the operation of local drainage system			
	e. Disrupt local farming activities			
	f. Disrupt community meetings/social events			
	g. Affect community security?			
14. Safety to community	Cause safety risk to community			List the activities/circumstance that may cause safety risks to local community
15. Public health	Cause concerns on public health/ sanitation /hygiene in local community			Describe the nature of the activities that may cause health risks or create unhygienic conditions in project area

16. Worker's health & safety	Cause workers health and safety concerns			
17. PCR	Impact cultural sites such as church, historical site, grave yard, etc.			
18. Community support	Does the project enjoy broad community support?			
19. Sustainability	Does the community have a plan for the management and maintenance of assets after implementation?			Management Plan to accompany application for funding
20. Land acquisition	Does the subproject involve voluntary land acquisition			
	<b>OPERATION PHASE -</b>			
1.	Water/soil pollution			
2.	Visual impacts			
3.	Nuisance, odour, unhygienic condition, public health risks			
4.	unhygienic condition, public health risks			
5.	Conflict with downstream water users?			
6.	Other issues			Specify



**Impacts Screening for COMPONENT 2 subproject:** During the preparation of EOI, partnerships will be required to fill in FORM 4 below to identify the potential impacts

**FORM 4 – SOCIAL AND ENVIRONMENTAL IMPACTS SCREENING FOR COMPONENT 2**

RURAL DEVELOPMENT PROGRAM II		
FORM 4 : IMPACTS SCREENING FOR COMPONENT 2		
Filled in by the Lead Partner, and checked and verified by the Environment Officer		
<b>Partnership name and brief description:</b>		
Question: is any part of the partnership, or its associated activities ...?	Yes	No
1. Be situated in a location, or disturb or discharge materials, wastes (including litter) into a sensitive environment listed below? Sensitive environments include : - Streams, rivers or other water sources (e.g. natural springs) that are used for water supply; - Wetlands, lakes and ponds; - Shorelines, coastal lagoons and mangroves; - Coral reefs and sea-grass meadows; - Undisturbed natural forest (forest that has not been cut for fuel or timber or had tracks cut through it, other than footpaths); - Protected areas such as Conservation Areas, Wildlife Management Areas and National Parks; - Sites or natural features of archaeological, historical, traditional or cultural value or importance; - Areas of recognized conservation habitat value (including aquatic and marine habitats).		
2. Take surface water from stream, river for use? If yes, specify for which purposes		
3. Take groundwater water for use? If yes, specify for which purposes		
4. Use renewable resource for energy supply If yes, specify. For example solar, timber If yes, also specify for which purposes		
5. Use chemicals such as pesticide for pest control?		
6. Has gas emission? If yes, specify. For example smoke from timber fuel burning, generators etc.		
7. Generate solid waste ? If yes, specify the type of solid waste generated		
8. Generate wastewater If yes, specify from which activity. For example, from animal cage cleaning		
9. Have community members/customary landowners offered their land for use?		
10. Have workers exposed to bad odour/smell/gases every day		
11. Use natural vegetation as raw materials If yes, specify (e.g feed for pigs raising)		
12. Use existing power supply?		
13. Use other raw materials If yes, specify		

14. Lead to increase environmental risks, such as erosion potentials or spreading of harmful species		
15. Other issues (specify)		
Additional Explanation: -		

The information provided in Form 3 or 4 will help to recognise the potential impacts during construction and operation phases so as relevant mitigation measures can be selected for subprojects

After the potential impacts and risks have been identified based on characteristics of the sites, the types of construction and operational activities, the next step is to determine the mitigation measures as discussed in section 3.3 below.

### ***3.3 Step #3 - Select Mitigation Measures***

With the potential impacts and risks identified in step #2, a set of mitigation measures and environmental solutions can be identified to address these impacts, and furthermore, make the project environmentally sound and more friendly to the users.

#### **3.3.1 Component 1 subprojects**

The mitigation measures and environmental solutions can be implemented at various stages, such as site selection, engineering design, construction or operation. It is very important to be aware that the stake holders responsible for implementing the mitigation measures at each stage would also be varied, typically:

- The Community Helpers/the Engineer will be responsible for incorporating the proposed mitigation measures and environmental solutions into technical designs
- The Contractor will be responsible for implementing the mitigation measures to avoid or minimise environmental impacts that may occur during construction phase.
- The benefited community may be required to implement some mitigation measures at pre-construction or during construction phase. These benefited communities will be responsible for implementing MOST of the mitigation measures during operation phase, including ensuring proper operation and regular maintenance of the works provided by RDP II.

**RURAL DEVELOPMENT PROGRAM II****FORM 5 - ENVIRONMENTAL SOLUTIONS AND MITIGATION MEASURES**

For Facilities under Component 1

Filled in by CHs with input from Engineer and checked and verified by the Environment Officer

**Sub-project name and brief description:****Location Village and Province:**

A = Applied    N/A = not applicable in this subproject. When a solution/mitigation measures is proposed, associated costs should be estimated and incorporated into the total cost of the subproject

**I - DESIGN PHASE**

	Issue	Environmental /Design Solutions	A	N/A	Costed (Y/N)
<b>ALL FACILITIES UNDER COMPONENT 1</b>	Landslide, erosion	Re-sitting the facility to avoid erosion/landslide risk			
		Landscaping, re- shaping slopes to reduce landslide risks			
		create vegetative cover			
		Stabilise with concrete structure or combined with grass			
		Others (specify)			
	Flooding, proximity to existing water bodies	Re select the site to avoid flooding hazard; avoid pollution caused to these water bodies from waste and wastewater generated during construction and operation phases			
		Elevate the floor of the building above the existing ground			
		Improve existing drains			
		Build new drains surrounding the facility			
		Elevate the ground before construction			
		Others specify			
	Access- sibility	Build safe access for users/operators			
		Others (specify)			
	Trees, objects	Avoid through refining site-selection to avoid trees cutting or cultural objects			
		Others specify			
	Disrupt existing facilities	Relocate the waste pipes/drainage channel			
		Reinstate road surface			
		Build alternative drain			
		Design gas exhaust pipe, waste bins, toilets, wastewater discharge point not at the side where residential houses are			
		Others (specify)			
	Outer design	Outer design decorated to enhance attractiveness and			

PIPED WATER SUPPLY only		reflect the building functions and Solomon Islands culture?			
		Use community knowledge and skills to decorate the building			
		Maximise natural lighting inside and outside			
		Staircase safe and convenience for special uses (small children, people with physical disability, pregnant women, sick people?)			
		There are playground for the children (school, kindergartens)			
		Include additional items to make the building usable for multiple purposes such as receiving guests overnight, or evacuation			
		Others (specify)			
	Environmentally sound	Water supply and sanitation facility is included			
		Drainage within and/or surrounding the building			
		Options for solid waste collection and disposal, particularly hazardous waste such as medical wastes from health care buildings. e.g. simple incinerators			
		Use locally available renewable materials			
		Use local labour for simple manual work			
		Outer design fit with the surrounding landscape			
		There are space designed for planting trees, plants and flowers by communities			
		The building insulated from solar heat with locally available renewable materials, such as palm leaves?			
		Others (specify)			
	Headworks, elevated tanks	Borehole is locate borehole away from sanitation facilities, animal cages, and any other source that may cause groundwater pollution			
		Water quality is tested in laboratory where possible. Otherwise the engineer should test through observation on clarity, odour, taste, temperature etc. Laboratory for water quality testing: - The National Public Health Laboratory NPHL - Solomon Islands Water Authority SIWA			
		Designed extraction rate is appropriate, taking into account environmental flow for down streams and other unconnected water users			
		Surface water collection basin is covered with lid to prevent debris, leaves, etc. from entering the chamber			
		Collection chamber has walls for sand to settle before water entering the outlet			
		Design safe access to head work is provided to operators			
		Safety warning and water saving signs attached to the source work			

		Signboards with message of saving water, protect water sources for sustainable usage placed at public places			
		Others (specify)			
		Apply measures for erosion control where pipes passing high slopes			
		Apply measures to minimise flood damage where the pipeline encounters water courses or flood paths			
		Apply measures to stabilise the pipes where topography or soil condition changes			
		Trenches are refilled after pipes are laid			
		Others (specify)			
		Dimensions of concrete apron is adequate for water collection and on-site washing			
		Adequate drainage to ensure no ponding or stagnant wastewater at the surroundings			
		Protected to prevent access of pigs, chicken etc. to cause pollution and damages			
		Others (specify)			
		lightening protection for tall structure such as elevated water tanks			
		Others (specify)			
	RAINWATER TANKS only	Filter/screen placed at entry point to prevent litters coming into the tank			
		Drainage for the areas where users' containers are placed			
		There are space designed for planting trees, plants and flowers by communities			
		The top/lid is closed to prevent mosquito breeding and leaves, debris flying in			
		Signs saying "save the water" or "every drops count" should be placed at the tank			
		Has discharge valve at the bottom for periodical cleaning			
		Others (specify)			
	SANITATION	Design is safe and convenient access, particularly for the children and disabled persons?			
		Ground elevation above regular flood level			
		Outer design fit with the surrounding landscape			
		Separate rooms for men and women			
		Others (specify)			
		Has window for odour dispersion and sufficient natural light at day time			
		Effluent discharge point of the septic tank is at least 20 m from any existing surface water bodies			
		Effluent discharged to vegetated areas, not left uncontrolled to open ground			

		The outlet point on the ventilation pipe is high enough to maximise dispersion of bad odours			
		Paper bin is provided			
		Others (specify)			
	maintenance	There are manholes for inspection and maintenance of septic tanks			
		Floor and walls paved with tiles for easy cleaning			
		Water facilities for hand washing are included			
		Personal hygiene signs attached to the building to promote proper personal hygienic practices			
		Others (specify)			

**CONSTRUCTION PHASE****II MITIGATION MEASURES FOR CONSTRUCTION PHASE - ECOP**

Issue/Risks	Codes of Practices to address the potential Issues/Risks		Yes	No	Carried out by
<b>1. Disruption of vegetative cover, tree cutting (V)</b>	V1	Store topsoil from excavated area for vegetation planting/ reinstatement at the end of construction			
	V2	Only cut trees and remove vegetation in areas specified in the design.			
	V3	Keep the area of vegetation removal minimal. Avoid loading the pipes, timbers, construction tools on vegetated areas. Place them on barren soil			
	V4	Restore vegetation cover on barren soil at the end of construction			
	V5	Plant native trees to compensate for trees logged for timber used in the sub-project or create vegetation cover			
	V6	Refill excavated areas and cover with top soil for vegetation cover to regenerate			
		Others (specify)			
<b>2. Affect natural/ ecological resources (E)</b>	E1	Erect temporary fences to protect the preserved trees before commencement of any works within the site.			
	E2	Do not disturb (e.g. logging, hunting, catching, shooting, poisoning, littering) breeding ground of fishery resources such as swamp/lagoon/sea grass bed, mangrove areas, or grassland seasonally inundated, or any area that is protected as a green space.			

	E3	Only use legal timber for construction by requiring the supplier to show a certificate for timber				
	E4	Only use local native species of vegetation for planting and restoration of natural landforms				
	E5	Do not dig excessive amounts of sand, gravel or rocks from rivers for construction.				
	E6	Do not extract materials from live coral reef for construction materials. Dead coral plays an important role if they are on the shoreline, extraction would affect stabilisation of the shoreline and if they are dead under the water they form part of the habitat therefore the extraction of coral should be limited in these circumstances.				
		Others (specify)				
<b>3.Landscape management (L)</b>	L1	Maintain vegetation cover where possible				
	L2	Implement good waste management practices				
	L3	Cover construction waste with top soil for planting trees/flowers				
<b>4. Solid Waste Management (S)</b>	S1	Provide waste bins for litter/garbage and refuse collection. Waste bins shall be covered, tip-proof, weatherproof and scavenger proof.				
	S2	Do not burn waste on-site				
	S3	Store solid waste temporarily on site in a designated area approved by the Work Supervisors				
	S4	Dispose of construction waste only in areas approved by local community/authorities				
	S5	Do not dispose of any material in environmentally sensitive areas such as swamp/lagoon/sea grass bed, mangrove areas, or grassland seasonally inundated, or any area that is protected as a green space in watercourses.				
	S6	Reuse recyclable materials where possible. Materials such as wooden plates, steel, scaffolding material, site holding, packaging material shall be collected and separated on-site from other waste sources for reuse, for use as fill or provided to recycling vendors.				
		Others (specify)				
<b>5.Wastewater (W)</b>	W1	Ensure accessibility to toilets for workers				
	W2	Do not discharge wastewater from toilets directly				

		into any water body.				
	W3	Cover and seal off all water collection tanks and septic tanks at the end of construction.				
<b>6. Chemical or hazardous wastes (H)</b>	H1	Do not use materials containing asbestos for construction				
	H2	Handling of asbestos-containing materials and other toxic substances is only to be carried out by specially trained and certified workers				
	H3	Collect used oil, lubricants, cleaning materials, etc in holding tanks.				
	H4	Store chemicals with appropriate labelling and signboards				
		Others (specify)				
<b>7. Dust (D), Air quality (A)</b>	D1	Ensure dust generated from construction activities is minimal and at acceptable level				
	D2	Spray water in dusty area in dry weather				
	D3	Cover material stockpiles				
	D4	Cover trucks carrying granular materials				
	D5	Stop construction and spray the site when there are complaints about dust				
	A1	Vehicles used must comply with SI regulations on allowable emission limits of exhaust gases				
	A2	Do not burn waste on-site				
	A3	Drivers must turn engines off if vehicle is idle for more than 5 minutes				
		Others (specify)				
<b>8. Noise (N)</b>	N1	Install silencers/mufflers on exhaust of noisy machines in acoustically protected areas				
	N2	Dampen concrete/roads before cutting				
	N3	Avoid construction activities before 6am and after 6pm				
	N4	Inform local communities at least two days before construction takes place during early morning and/or late at night				
		Others (specify)				
<b>9. Erosion (R), Siltation/ Sedimentation (Se)</b>	R1	Design slope stabilisation solutions if the works are to be built on slopes				
	R2	Provide permanent drainage structure if the works is on a slope				
	R3	Include energy-dispersion structures in drainage system				
	R4	Avoid excavation works during wet season				
	R5	Keep ground clearance area to minimal levels				



		possible				
	R6	Reinstate vegetation cover at earliest opportunity				
	R7	Carry out shaping and re-profiling cutting of slopes to minimise erosion potential				
	R8	Replant trees on exposed land and slopes to prevent or reduce land collapse and keep the stability of slopes				
	Se1	Maintain drainage system to ensure they are free of mud and other obstructions				
	Se2	Maintain original condition of undisturbed area at construction sites				
		Others (specify)				
<b>10. Water Quality (Wq)</b>	Wq1	Avoid ground disturbance near water sources				
	Wq2	Design and install sediment traps to collect sediment from rainwater before surface flow enters water bodies				
	Wq3	Do not wash tools in streams, rivers or lakes				
	Wq4	Do not dispose of construction materials and waste in water bodies				
	Wq5	Follow chemical management instruction (Coded H) to prevent chemical leaks into water bodies				
		Others (specify)				
<b>11. Localised flooding (F)</b>	F1	Maintain existing drainage if possible				
	F2	Create drains surrounding material loads stored at the work site				
	F3	Periodically clean up drains at the site				
<b>12. Disturbance to cultural sites (C)</b> (temple, church, community)	C1	Avoid unloading materials, parking vehicles/construction plants within 20 m of any cultural site. If this is unavoidable, the unloading/parking should be finished within 3 hours				
	C2	Spray water regularly if construction is near any cultural structure				
	C3	<b>Chance Find Procedure:</b> detailed in Annex of ESMF				
		Others (specify)				
<b>13. Social disturbance (applies as required to all actions under</b>	Sd1	Inform community at least one week before site clearance is started				
	Sd2	Maintain open communications with the provincial government and concerned communities (erect notification boards in local language/s at construction sites providing information about the project and contact				

<b>ECOPs</b>		numbers) Respond to telephone inquiries and written correspondence in a timely and accurate manner Monitor community concerns and information requirements as the project progresses				
	Sd3	Coordinate with local authorities (leaders of local wards or communities, leaders of villages) for agreed schedules of construction activities at areas near sensitive places or at sensitive times (e.g. religious and/or festival days).				
	Sd4	Inform local residents about construction and work schedules, interruption of services and demolition where applicable				
	Sd5	Investigate and implement alternatives to avoid the use of playground space and loss of playing fields for construction sites Carry out consultation with those affected as early as possible if it is not avoidable to use these sites				
	Sd6	Reinstate all disturbed areas including roads				
		Others (specify)				
<b>14. Public Health (P)</b>		See specific measures relevant to various types of sub-projects				
<b>15. Worker and public Safety (Sa)</b>	Sa1	Brief workers on occupational health and safety regulations				
	Sa2	Install fences, barriers, dangerous warning/prohibition signs around the construction area				
	Sa3	Implement traffic control measures, including road/rivers/canal signs and flag persons to warn of dangerous conditions				
	Sa4	No children allowed to be around during excavation, installation of structures particularly bulky items				
		Others (specify)				
<b>16. Occupational Health (O)</b>	O1	Use protective gear while working				
		Others specify				
<b>15. Voluntary Land acquisition</b>	L	Fill in Voluntary land donation form and signed by relevant parties				
		Others (specify)				
<b>III OPERATION PHASE – BENEFITED COMMUNITY’S RESONSIBILITIES</b>						

Issue	Mitigation measures	Yes	No
Materials/ Timber used	Reinstate vegetation cover		
	Replant the same species of the trees cut down for timber or site clearance in public land of the community		
	Others (specify)		
Operation	Proper use and operate the facility provided		
Cleaning, maintenan ce	regular cleaning the facility build under RDP II, including the inside, outside and ancillary items such as drains, sanitation, water supply facilities		
	Replace broken parts/pieces if technically feasible		
	Others specify		

### 3.3.2 Component 2 subprojects

During the preparation of a detailed Proposal for a specific Agricultural Partnership subproject, the project proponent will prepare a detailed plan describing how the potential socio-environmental risks of a partnership will be avoided or addressed. Examples of some of the mitigation measures that can be selected are in the menus given in FORM 6 below.

<b>RURAL DEVELOPMENT PROGRAM II</b>  <b>FORM 6 - ENVIRONMENTAL SOLUTIONS AND MITIGATION MEASURES</b> For investments under Component 2			
Filled in by the Lead Partner , and checked and verified by the Environment Officer			
<b>Partnership name and brief description on the activities to be financed:</b>			
<b>Location:</b>			
A = Applied    N/A = not applicable in this subproject. When a solution/mitigation measures is proposed, associated costs should be estimated and incorporated into the total cost of the subproject			
<b>The list of mitigation measures below should be further updated during the implementation of RDP II, when more specific information on the types of activities to be financed become available</b>			
	<b>Environmental Solutions</b>	<b>A</b>	<b>N/A</b>
<b>ALL CULTIVATION</b>	Apply waste-saving methods when watering during seedling/ nursery		
	Crop is not irrigated, thus no mitigation measures applied regarding efficient water saving		
	Others specify		
	No fertiliser used, thus no mitigation measures applied regarding efficient water saving		

	On-site soil fertility improvement, by leaving unharvested products including leaves, tree trunks, unusable fruits/seeds etc on site		
	Divert contaminated surface runoff from cultivated areas so as it does not enter drinking water source directly		
	Others specify		
HILL SIDE GARDENING	Terracing to minimise runoffs and erosion		
	Re-vegetation to avoid erosion and sedimentation of vegetation down slope		
	Minimise clearance of native vegetation		
	Containment of site using mound high enough to trap surface runoff		
HONEY PRODUCTION	Avoid placing bee hives/activity in public places to avoid hazard for the public such as the bees attacking people		
COCOA PRODUCTION	Constant monitoring to identify invasive weed and pest species, contain them and eradicate them as quick as possible using non-chemical method		
	Apply IPMP		
	Other / specify		
POULTRY/PIG RAISING	Place poultry/pig house away and at the end of predominant wind direction to avoid or minimise bad odours and noise impacts on house		
	Keep waste and waste and wastewater from poultry/pig house away from water bodies		
	Treat and use poultry/pig manure as fertiliser		
	Others specify		
CATTLE GRAZING	Yards, holding pens or feedlots are at least 20 m from any surface or ground water extraction points		
	Use water in an effective ways		
	Do not let wastewater runs directly into water sources		
	Use feeds from farms		
	Treat and reuse wastewater for cultivation		
	Treat and reuse manure as organic fertiliser for cultivation		
	Safe storage, handling, usage and disposal of chemicals used for animal disease control, if any,		
	Safe disposal of dead animals, not to leave uncontrolled in open dumps or throw into water courses		
	Create and maintain buffer zones between the grazing fields and the water bodies		
Primary processing	Leave open space surrounding drying facility so as smoke can be dispersed easily		
	Chimney of drying facilities should be of adequate high and located suitably to avoid smokes from coming into nearby houses and other existing facilities		
	Use sustainable source of fire wood for drying, e.g. collecting fallen tree		

Secondary Processing	branches/trunks or use coconut shells		
	Plant trees to provide fire wood source for drying		
	Improving/optimize design of drying facilities to improve drying efficiency		
	Store fermented products or products being fermented in roofed areas to avoid surface water contamination and ruining of products		
	Efficient use of water used for cleaning raw materials		
	Efficient use of energy for heating, lighting		
	Maintain good hygienic conditions in production unit		
	Make good use of by-products or waste generated from oil processing, for example for cooking/burning or for feeding animals		
	Treat wastewater and do not let wastewater runs directly into nearby drinking water sources		
	Take care of Occupational health for workers		
	Others		

### 3.4 Step 4 –Implementation of mitigation measures; monitoring and supervision and reporting

#### Step 4A – Implementation of mitigation measures

The purpose of this step is to avoid, address, manage or mitigate the potential impacts and risks that may happen during the construction and operation of the proposed investments through the application of the mitigation measures proposed in Step 3 in engineering design and construction practices.

#### Step 4B – Monitoring and supervision

Monitoring, supervision and reporting should be carried out during the design and construction phase to ensure that the potential impacts and risks are avoided, mitigated or addressed on time. Timely monitoring and supervision allows the project proponent to timely address any issues arisen during construction/operation phase. Monitoring also help to draw lessons for future similar subprojects.

#### Step 4C –Reporting

## 4. Land Acquisition Guidelines

The project will not support activities that involve involuntary relocation, nor will it provide compensation for any land or assets on land required for a sub-project. Therefore, in the event that land is required as part of a sub-project proposal, a **“Land Commitment Letter”** must be signed into between the clan that owns the land and the other representatives (clans and traditional leader) of the community. The Land Commitment Letter used by RDP since 2008 is presented in Annex 2. If necessary, a duly completed Land Commitment Letter must accompany a community sub-project proposal to be considered for approval.

The process that would be used under RDP to enter into the terms of a Land Commitment Letter is as follows:

- If land is required for the identified community sub-project then the clan leaders of the community, along with other community leaders as appropriate <sup>4</sup>(chief, religious leaders, etc.) would organize a meeting with the representatives of the specific clan who have customary ownership of the proposed land;
- The meeting would discuss the proposed sub-project with the land owning clan (in the event the clan had not participated in the community meetings to prioritize the sub-project) to share the rationale for the sub-project and its proposed siting, and seek the donation of the necessary land by the owning clan;
- At the same time, the owning clan would also be notified clearly that their agreement to donating their land should be completely voluntary;
- If the owning clan agrees, then a Land Commitment Letter will be signed between the clan, the other clans and the leader of the community;
- The signed Land Commitment Letter will be submitted as part of the sub-project proposal.

## 5. Feedback Acceptance, Grievance Redress Mechanism

RDP has in place a Grievance Redress Mechanism (GRM) that is designed to facilitate feedback from any project participant or stakeholder regarding project operations, management, use of resources and impacts of activities, intentionally or otherwise, and resolution of the same by project management, Government and/or the World Bank. In the event that any project stakeholder feels that the principles or processes of the project have not been adhered to or followed, or that resources have been misused or any person or persons have abused the process for personal gain, or that the Project is seen as harming households or community groups, then those stakeholders have the right to raise their concerns and to seek satisfactory acknowledgement and resolution of their grievances. This right is essential to ensure transparency and accountability. Stakeholders will be informed of the Project GRM through community meetings, project documentation and through the local media. The Project Grievance Resolution Mechanism uses a three stage approach:

**Stage 1:** If the source of the concern is located within a community itself, then the first attempt to resolve the problem will be made through traditional methods and mechanisms at village level (relying on village elders or other respected individuals/institutions such as churches, etc.) to report and resolve the issue if possible. Otherwise, a public meeting may be called to help resolve the problem.

**Stage 2:** If local methods cannot solve the problem to the satisfaction of the concerned stakeholders, the stakeholders may then take the matter to the Provincial Secretary or RDP Provincial Team Leader, who will endeavour to propose a satisfactory solution.

**Stage 3:** Should the Provincial Secretary nor RDP Provincial Team Leader be able to offer a satisfactory solution, the matter may then be referred to the Provincial Grievance Committee. If there is currently no such committee, the Provincial Secretary, with Provincial Assembly endorsement will appoint such a committee. The committee will include the appointed Women, and Church representatives. The Committee will consider whether the grievance is genuine and, if so, will suggest an appropriate course of action to resolve the matter. If, however, either the aggrieved party or the party at fault does not accept the suggested solution, the Grievance

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<sup>4</sup> The RSDLGP Social Assessment found that the church plays an important role in discussions around land allocation in Central Provinces

Committee may then direct that the matter be forwarded to the Village Court system for resolution.

If, for any reason, stakeholders feel that the local institutions cannot assist in the resolution of grievances because they include an individual or individuals who have themselves abused the process, then they may take their grievance to the Project Coordination Unit (PCU), either directly, or through any other third party such as an NGO, a faith-based group, or a women's network, etc.

The Community Helper would be responsible for recording the grievance or complaint using FORM 6, below, and for reporting to the PSU on grievances recorded through his/her quarterly progress report. If, due to its nature, the grievance requires immediate attention, the Community Helper would inform the PSU without waiting for quarterly report submission. The summary report of grievances/complaints from the CHs would be captured in the project's management information system (MIS) at the by the Provincial Team Leader. The MIS would track the date and type of comment or complaint (informational, regarding sub-project process, project staff behaviour, use of sub-project financial resources, etc.), how and when the comment or complaint was resolved. The Provincial Team Leader and Provincial Secretary will consult each other on all complaints received on at least a quarterly basis to respond to any systematic issues or problems. The PCU (M&E Officer) would track and report on the overall project grievance resolution process to the World Bank for discussion and action as required during semi-annual implementation support missions.

**FORM 7 - Community Feedback/Complaints Records****Name of Communit Helper:****For the period from: ...../...../..... to ...../...../.....**

<b>Date</b>	<b>Name</b>	<b>Nature of Complaints</b>	<b>Actions taken to follow up and Outcomes</b>	<b>Complaints addressed completely?</b>

**6. Implementation Responsibilities****Responsibilities of RDP II Key stake holders in implementing RDP II ESMF**

<b>Stake holder</b>	<b>Key Responsibility</b>
<b>Stake holder</b>	<b>Key Responsibility</b>
PSU/PMU	Facilitate information disclosure process
Project Engineers	<ul style="list-style-type: none"> <li>• Provide inputs to sub-project ECOPs as and when required</li> <li>• Incorporate relevant mitigation measures proposed in sub-project ECOPs into detail engineering design of subprojects</li> <li>• Incorporate Environmental Codes of Practices and relevant Mitigation measures into bidding documents and construction contract</li> <li>• Oversee the implementation of mitigation by the communities/contractors</li> <li>• Provide guidance to communities/contractors to address arisen socio-environmental issues during construction phase of the work</li> <li>• Provide technical guidance to benefited community to promote safe and environmental sound maintenance of the works</li> </ul>



Stake holder	Key Responsibility
	provided
Community Helpers	<ul style="list-style-type: none"> <li>• Attend safeguard training organised by RDP</li> <li>• Facilitate project activities related to community consultation and information dissemination</li> <li>• Collect local information to provide inputs for socio-environmental eligibility and impacts screening</li> <li>• Facilitate community in preparing socio-environmental eligibility screening for relevant subprojects during community meeting and follow up till finalisation</li> <li>• Facilitate community, particularly assist SIC, in preparing socio-environmental impacts screening for subprojects and follow up till finalisation</li> <li>• Facilitate community participatory monitoring during the construction phase of relevant sub-projects</li> </ul>
Community SIC	<p>With the assistance of Community Helpers and the guidance of SIC, members of the benefited communities will:</p> <ul style="list-style-type: none"> <li>• Participate in environmental screening process,</li> <li>• Propose alternative options to ensure that sub-project are eligible and/or have minimal negative socio-environmental impacts</li> <li>• Provide inputs for socio-environmental impacts screening of subproject and preparation of EMPs</li> <li>• Actively participate in environmental monitoring during construction</li> <li>• Undertake mitigation measures during the construction phase of the works provided by RDP</li> <li>• Arrange and implement proper maintenance of the works to ensure potential impact during operation phase are mitigated</li> </ul>
Contractors	<ul style="list-style-type: none"> <li>• Implement the mitigation measures specified in construction contract</li> <li>• Monitor environmental conditions in areas disturbed by the contractor and report to the work supervisor/the Engineer.</li> <li>• When socio-environmental issues are arisen, report the issues to the Work Supervisor/the Engineer to obtain guidance on actions. Make records of such issues and follow up</li> </ul>

## Annex 1- Chance Find Procedures

In the event that artefacts, objects are exposed during construction phase, the contractor and relevant stakeholders will follow the procedures described below:

- a. Stop the construction activities in the area of the chance find.
- b. Delineate the discovered site or area.
- c. Notify village leaders and secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard or other relevant protection shall be present.
- d. Notify the Community Helper, who in turn would notify the Provincial Team Leader (within 72 hours).
- e. Contact the responsible local authorities who would be in charge of protecting and preserving the site before deciding on the proper procedures to be carried out. This would require a preliminary evaluation of the findings to be performed by the National Museum or National Archives. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, including the aesthetic, historic, scientific or research, social and economic values.
- f. Ensure that decisions on how to handle the finding be taken by the responsible authorities. This could include changes in the layout (such as when the finding is an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage
- g. Implementation for the authority decision concerning the management of the finding shall be communicated in writing; and
- h. Construction work will resume only after authorization is given by the responsible local authorities concerning the safeguard of the heritage.

During project supervision, the Environment Officer shall monitor the above regulations relating to the treatment of any chance find encountered are observed.

Relevant findings will be recorded by the World Bank in its regular supervision mission and through the Implementation Status and Results (ISR) Reports. If deemed appropriate, the project's Implementation Completion Reports (ICRs) will also assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

## Annex 2 - Land Commitment Letter Template

Team Leader \_\_\_\_\_

Provincial Support Unit \_\_\_\_\_

Province \_\_\_\_\_

Dear Sir,

**Re: LAND AVAILABILITY FOR THE PROJECT**

This letter serves to confirm our commitment that land is available for the project. This land is given for the use of the \_\_\_\_\_.

The owners of the land in our community are Mr/Mrs. \_\_\_\_\_ who with a second family/tribal member confirm our commitment by putting their hand hereto;

This piece of land ( \_\_\_\_\_ ) is confirmed to be free from dispute and the Project Committee and subsequent committees appointed by the village to administrate the infrastructure are free to use the said land to provide/improve/expand the provision of the services directly provided by the infrastructure. The land owners fully agree that this commitment is irrevocable.

1. Resource owner (Name)

\_\_\_\_\_

2. Resource owner representative

\_\_\_\_\_

2. Signature

\_\_\_\_\_

\_\_\_\_\_

3. Date

\_\_\_\_\_

\_\_\_\_\_

4. Verified by Project Chairman and Secretary

\_\_\_\_\_

Chairman

\_\_\_\_\_

Secretary

## Annex 3 - Experiences from Similar Past Facilities

### SITING, DESIGN, CONSTRUCTION OF COMPONENT 1 FACILITIES

BUILDINGS	
<p>All Buildings should have</p> <ul style="list-style-type: none"> <li>• Good access and safe for specific users such as pregnant women, young children, people with physical disability</li> <li>• attractive outlook, some landscaping outside</li> <li>• enough light inside</li> <li>• water supply and sanitation</li> <li>• easy to keep clean</li> <li>• usable for multiple purposes in some cases</li> </ul>	
COMMUNITY HALLS	
 <p>A sanitation facility was built together with the community house. As the roof is large, rain water tanks should also be provided</p>	 <p>Community house looks more attractive if it is painted with brighter colour, and decorated with art works made by the community</p>
 <p>Large windows helps to ensure the room has enough light during day time. The floor is smooth so it is easy to clean.</p>	 <p>The building would look more attractive if some flowers and plants with colourful leaves are planted in the surrounding area.</p>
WOMEN RESOURCE CENTRE	
<p>Beautiful landscaping with colourful trees and plants growing surrounding the women resource centre makes the building a lot more attractive.</p>	<p>Small room in the building for short term renting would be good source of supplement income for women's activities</p>



The signboard at the entrance was designed as an artwork



Women should participate in planning

### KINDIES, SCHOOL

ALL should be attractive and safe to the children

- Classrooms
- windows and doors
- Chairs and tables
- Staircase
- Sanitation facility
- water supply
- Playground for outdoor activities

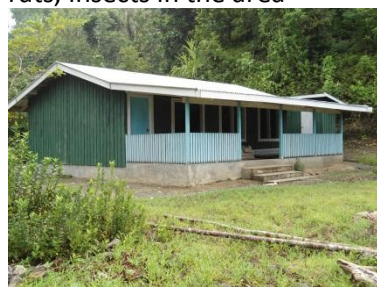
Outers and inside should be decorated to make it attractive to young children. Dark colour outside the building makes it look sad and boring



A paved path to connect the building with the main existing footpath should be provided



The bush in the surrounding areas should be cleared up to prevent attraction of mosquitos, rats, insects in the area



Children like paintings, colours so decorate the entrance and inside beautifully and colourfully









 <p>Colour painting, cartoons, decorations make kindy classrooms look interesting and attractive to children</p>	 <p>Chairs, tables, etc should also be colourful as children like colour</p>
 <p>Lighting is important to classrooms to keep childrens eyes healthy. Classrooms should have big windows to keep the classroom have enough daylight inside School building should be painted in bright colour to make the children feel happy and learn better The floor should be smooth so as it is easier to keep it clean</p>	
<b>MEDICAL CARE POSTS: NURSE AID POSTS/MARTENITY WARD/NURSE AID POST</b>	
<p>Make sure that the building is safe and easy to access for the users</p> 	<p>There should be convenience access to the sanitation facility attached to the building</p> 
<p>Sanitation, rain water supply should be built</p> 	<p>Design of the building should allow sufficient lighting from sunlight as a way of natural disinfection</p> 

Options for treatment/disposal of medical wastes should be determined, either on-site incinerator or provide the boxes for separating medical waste, and arrangements for transportation to substation	
<b>MARKET BUILDINGS</b>	
 <p>Wood is locally available. Wooden structure requires maintenance including repainting and replacement of broken ones. Concrete structure is stronger but more expensive</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="607 533 1008 982">  <p>Well built ditch around the slabs of the sheds</p> <p>Good drainage within and surrounding the market is needed to keep the market clean in rainy weather. Regular cleaning is of drains is necessary</p> </div> <div data-bbox="1013 533 1390 982">  <p>Toilets are essential where there are large numbers of people concentrated. Regular cleaning is good maintenance practice</p> </div> </div>
 <p>Market should be kept very clean. Ponding water provides breeding ground for mosquitoes and can pollute market products. Flies, dirt, garbage, vermin can contaminate the food and lead to sickness to consumers</p>	 <p>Organic/vegetable waste from market should be collected, and recycle from composting. Composting can turn organic waste into a good soil conditioner with valuable nutrients, which is good for crop growing. Composting also help to reduce the volume of garbage to be dumped</p>

### RAINWATER SUPPLY SYSTEM

A typical rain water supply system includes

- Catchment, gutters and connecting pipes
- Rainwater tank with taps
- Base for putting the tank on top
- basin for putting water containers inside

		
<p>Catchment can be an existing roof, or newly built one. The roof area should be large enough for filling the tanks to the full level</p>	<p>This system should have a safer and more convenience base for users and containers</p>	<p>Beautiful landscaping and decoration around the tank.</p> <p>Filter/screen should be placed on the gutter to prevent litter, leaves etc. falling into the tank</p>
<p style="text-align: center;"><b>PIPED SUPPLY SYSTEM</b></p> <p>Water quality should be tested where possible, at The National Public Health Laboratory NPHL or Solomon Islands Water Authority SIWA. Otherwise the engineers should at least check water quality by observation if laboratory is not available</p> <p>A typical water supply system includes</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Surface water supply</p> <ul style="list-style-type: none"> <li>• Catchment at source</li> <li>• transmission pipes</li> <li>• taps/standpipes with basin</li> <li>• <b>drainage</b> at standpipe</li> </ul> </div> <div style="width: 45%;"> <p>Groundwater supply</p> <ul style="list-style-type: none"> <li>• Boreholes and pumphouse with power/fuels for pump operation</li> <li>• Transmission pipes</li> <li>• Elevated tanks</li> <li>• Connection pipes</li> <li>• Standpipes</li> <li>• <b>Drainage</b> at standpipes</li> </ul> </div> </div>		
<p>Collecting catchment Spring intake structure should be covered to prevent leaves and debris entering dam.</p> <p>Lining the walls could reduce erosion by strong inflow.</p>	<p>Sand, sediment settled in the dam should be cleaned out regularly</p>	
		



	 	<p>The pipes should be burried for protection from sunlight. The trenches should be marked so as easier to track for repair/replacement.</p> 
		
<p>Well decorated surroundings of this standpipe.</p> 		<p>This base is good for drainage; however, extraction of coral materials from seashore for construction is not encouraged. Should use materials from operating quarries where possible.</p> 
<p>Stagnant water was observed surrounding the standby. the base should be larger, concrete drainage apron and pipes should be installed and maintained properly concrete drainage apron</p>		 <p>Drainage pipe at this standpipe should be longer and big enough to drain all wastewater away to avoid blockages and stagnant water</p>

### SANITATION FACILITY

#### Septic tank toilets should always built with water supply facilities provided



Good public toilets should have separate entrances for men and women, and a public hand washing areas. Regular cleaning is necessary

This building has good outer appearance and ventilation for both the toilet rooms and septic tanks. The gas ventilation pipe is high above so as the gases emitted can be dispersed better



Tawaro sanitation, Malaita



Sewer pipes should be buried all the way to the septic tank; There must be a ventilation pipe and a manhole for the septic tank.



This toilet building gets good level of sunlight. There should be small windows for natural lighting and ventilation when the door is closed. Water supply should be built together with the toilet


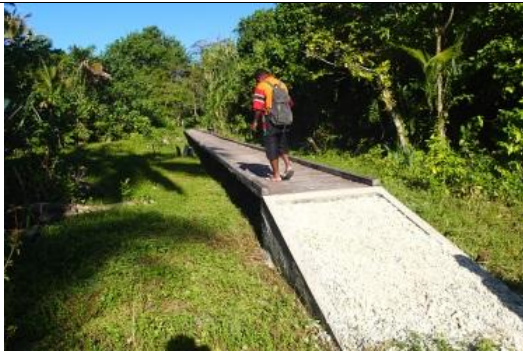


A good access, e.g. paved path should be built for this sanitation facility.








Outlet effluent should be let to closed drain outside, not freely discharge to the ground as it would lead to unhygienic condition and pose health risk to the public



FOOT BRIDGE	
Footbridge should be safe and convenience for pedestrians.	Grass regrow and well maintained after construction so the soil would not be washed away/eroded by wind and rainwater
	
Top of bridge should be above flood water level. In areas where flooding comes often, communities may prefer to have handrails and even roof	

### MANAGEMENT OF IMPACTS AND RISKS DURING CONSTRUCTION PHASE

 <p>Avoid extract sand, gravels or rocks from rivers or the sea because the pattern of the river may be seriously affected and lead to serious problems to human and productive areas elsewhere</p>	<p>Do not build structures close to river banks because even smaller rivers have great erosive force and can wash out their banks.</p> <p>Wastewater from the construction sites should not be discharged directly into water bodies as it cause water pollution and have bad affect on aquatic lives</p> 	 <p>Use locally available renewable materials where possible.</p> <p>Trees of the same type should be replanted to compensate for the timber used</p>
<p>Construction materials should be loaded and store neatly to avoid accident risks.</p> 	<p>Avoid, minimise disturbance on the vegetation cover and trees along the Rights of Ways to maintain good landscape and preven erosion by rainwater</p>	<p>Cement, wood loaded in roofed area so as they do not get wet or damaged by rain.</p> 

		
<p>Sharp, pointed pole tops are covered/shield to avoid accidents caused to whom walking around</p> 	<p>Provide/ensure temporary access is maintained during construction</p> 	<p>Working high above the ground would be at risk of falling down. Worker should be careful. Foot ware should be worn for protection</p> 
 <p>Provide/ensure temporary access is maintained during construction</p> 	<p>Children are active and it is very dangerous for them to be at construction site. They should be kept away from construction site throughout the construction phase to avoid accidents that may happen.</p>  <p>The excavated road should be properly reinstated to the same condition as "before"</p>	<p>Construction waste/excavated materials should not be left uncontrolled at the site. Top soil should be kept to cover the excavated material so as vegetation cover/grass can regrown to return landscape to as pre-construction.</p> 



**OPERATION AND USAGE: COMMUNITY RESPONSIBILITIES – Mitigation and maintenance**

Trees are cut down for timber, site clearance or for safety of the building from cyclones. Trees must be re-planted so as our children and grand children can use when they need in the future. **Villagers** should plant at least two to five new trees for every one tree cut down. Replanted trees should be of the same species as the the ones cut down, and at least at rate 2 trees (but ideally 5 or more) planted per 1 tree cut down as it takes very longtime to get the timber



Big holes may cause cuts to foots of pedestrians, children's foot may got stuck in the hole

Broken or damaged parts should be fixed as early as possible



Gutters should be cleaned regularly






Animals should be kept out of water supply system



Toilets must be used properly and keep clean



## Annex 4 – Possible Component 2 Activities Visited During RDP II Design

<p><b>Coco/coconut drying facility</b></p> <p>Main environmental concern is firewood used in relation to trees, although in a very small quantity; and impacts of smoke to the surroundings</p>	<ul style="list-style-type: none"> <li>• The facility is a simple wooden structure with metal roof</li> <li>• RDP could support with improving the structure of this facility to improve drying efficiency, such as replacing the missing timbers, improving the access/steps, lengthen the chimney etc.</li> <li>• Firewood/timber wood used for drying is collected from the surrounding within community, tree cutting is not required. RDP could initiate to help community plan for timber stocking</li> <li>• RDP could help to make the facility safer to use, ashes is under control, and chimney could be improved to reduce the impacts of smoke to the surroundings</li> </ul>
	
<p><b>Coco plantation</b></p> 	<ul style="list-style-type: none"> <li>• Cocoa plantation, old, trees need to be pruned or replaced, some can be grafted onto.</li> <li>• RDP I assisted with farming techniques, provide training on looking after the plantation, IPDM, and provided some farming tools. No chemicals are currently used or recommended.</li> <li>• No watering, crop depends on natural rain</li> <li>• No wastes generated as the seeds are collected and sold to local fermentry and dried then sold directly to dealers, no home-storage. Fruit pods are left in the plantation as natural fertiliser</li> <li>• RDP II may purchase some pesticide for pest control. If so IPM training, safe handling, usage and disposal of pesticide training should be provided and monitored. Management of containers, packaging materials should be considered</li> </ul>




**Small, household-sized coconut oil business**

Potential environmental impacts of these business are marginal and negligible

- RDP mainly support with partnership development to build capacity for small household business, physical investment is not likely
- Mostly manual work



- Good hygiene through production line as it will affect the quality of the oil



Almost no waste generated as the husks are used as firewood for cooking the oil. The extracted coconut meat is reused for animal feed



<p>Cocoa and other nurseries Potential environmental impacts of these activities are marginal and negligible. If trees are cut down for timber or site clearance. At least two new trees (but ideally 5 or more) for every one tree cut down. Replanted trees should be of the same species as the the ones cut down.</p>	<p>Vegetable and Taro production is often affected by pests. Commercial production may require the use of pesticides. RDP II may purchase some pesticide for pest control. If so IPM training, safe handling, usage and disposal of pesticide training should be provided and monitored. Management of containers, packaging materials should be considered</p>	
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## Annex 5 - Exit Process for Problem Sub-Projects

These guidelines are to be used when it is beyond doubt that factors affecting a Component 1 sub-project cannot be resolved or require support beyond RDP's capacities. The guidelines allow RDP to systematically respond to such situations by outlining what action is to be taken during both sub-project preparation and sub-project implementation. The actions described will also help communities avoid lengthy deliberation processes or extended periods of inactivity by providing time-bound steps leading to judicious decisions on sub-project termination. These steps need to be explained to communities as soon as a Community Helper (CH) or other RDP staff flags a project as potentially problematic.

### I. Preparation Stage (to the point of funds transfer to SIC's Bank Account)

Examples of likely issues leading to initiation of the exit process:

- early stage land dispute issues emerge which are unlikely to be resolved during TDF phase,
- community is unable to contribute a minimum of 15% towards their sub-project,
- unable to obtain consent letters from line ministry or the line ministry disqualifies the project,
- unable to obtain consent letters from resource owners,
- high probability of potential miss-management or capture of RDP funds, goods or assets by individuals or families
- religious, social or other divisions within the community indicate that public access to sub-project assets will be limited,
- community is unable to confirm/provide their contribution,
- co-funders do not provide signed surety of contribution or signed co-funding letter,
- TDF preparation period exceeds 3 months,
- cost of sub-project exceeds the budget ceiling and no co-funding is available.

#### STEPS TO FOLLOW:

- 1.1 Community Helper or other RDP staff advises the PSU/TL of emerging issue/s by providing a brief written report (this is important for records/information consistency) specifying (i) the sub-project and (ii) with reference to the above list of issues, the reason/s for identifying it as a potential problem sub-project,
- 1.2 Within two weeks of identification of a potential problem sub-project the PSU TL verifies CH's information through discussion with CH and consultation with the community,
- 1.3 If the problem cannot be resolved within two weeks of the consultation, or within RDP staff time and skills, the TL makes a report with recommendations for termination of sub-project preparation to the Provincial Secretary and,
- 1.4 The Provincial Secretary writes a letter to community through SIC informing it of the decision to terminate the sub-project.

### II. Implementation Stage (funds in SIC bank account)

Examples of likely issues leading to sub-project termination during implementation:

- land dispute,
- water source dried up,
- over ten per cents of materials unaccounted for,
- evidence of any financial or procurement irregularity,

- SIC not functioning as (i) implementing body, or (ii) means of communicating information on the sub-project to the community,
- no community support,
- nil or insufficient community's contribution,
- no progress with procurement of goods or building works. Progress will be measured against the time frame set out in the TDF. Slippage of more than three months from this time frame will automatically trigger flagging as a problem sub-project for investigation
- religious, social or other divisions within the community indicate that public access to sub-project assets will be limited,
- complaints received from the community relating to the above or about other issues are likely to lead to sub-project failure (note, any communications/complaints from community members/others directed to PUCE will be directed to the PSU's TL for investigation)

## STEPS TO FOLLOW

- 2.1 SIC/Community Helper advises PSU TL by providing a written report specifying (i) the sub-project and (ii) with reference to the above list of issues, a description of the reason/s for identifying it as a potential problem sub-project,
- 2.2 PSU TL convenes a consultative meeting (TL, CH, & SIC)
- 2.3 a grace period of *one month* is given to work on and resolve issues,
- 2.4 within the final week of this month, a report has to be sent by the PSU TL to the Program Manager
- 2.5 The report will contain:
  - 2.5.1 summary of sub-project information as per TDF,
  - 2.5.2 summary of current financial, legal (including contract dues) and construction progress status,
  - 2.5.3 description of the issue/s affecting the sub-project and recommendations,
  - 2.5.4 time line of remedial action already undertaken or, ONLY for sub-projects where there is a very high probability of successful remedial action, benchmarks of sub-project progress to be achieved in the 2 months following the grace period,
  - 2.5.5 recommendation of the TL and its rationale regarding the current rating of the sub-project. At this stage a sub-project can be rated as (i) recommended for termination (where problems have proved unresolvable), or (ii) under close observation (where the plan developed during the grace period requires more time to assess the outcome). This observation period can be for a period up to 2 months and progress will be tied to benchmarks established during the grace period. The rating can only be applied to sub-projects where there is very high potential of success. Should the benchmark not be achieved, the sub-project will automatically revert to "recommended for termination" status.
  - 2.5.6 PSU TL submits a report to the Provincial Secretary with cover letter advising on (i) on the sub-project status, (ii) the normal RDP course of action to be followed by the PSU (for close observation) or MDPAC (termination)
  - 2.5.7 Copies of the report and letter are sent to the PCU Program Manager and SIC chairman.
- 2.6 In the instance of a sub-project being recommended for termination, the Permanent Secretary of Ministry of Development Planning and Aid Coordination (MDPAC) will write a letter of termination to the SIC chairperson, copied to the Provincial PS, the TL, and PM PCU, informing the community/SIC of the final decision and grounds of termination. This letter should also:

- reiterate the steps taken to make the decision to terminate the sub-project,
  - the responsibilities of RDP staff in closing the sub-project,
  - the responsibilities of the community in relation to closure of the sub-project. This will reference the article of the Financing Agreement relating to termination of the FA,
- 2.7 The PSU TL, FO, Engineers and CH will retrieve unused stock or materials and arrange reimbursement of unspent SIC funds to RDP
- 2.8 Within two months of the MDPAC PS letter to the SIC, PCU accounts and procurement staff will prepare a termination statement which the PSU TL will include in a pro-forma exit report

## Annex 6 - Draft Terms of Reference for EO

The Environmental Officer (EO) will work closely with the Project Engineers, Community Helpers, Component 2 partnerships and Provincial government leaders and will report to the Project Manager of the PCU. The EO will work with relevant Component 1 and 2 staff on all aspects of the TOR and is expected to train and/or mentor the CH and Ministry of Agriculture and Livestock (MAL) staff and other project stakeholder on all functions and activities carried out under this TOR. The EO will be responsible for the following:

- To undertake all activities or discuss with relevant project staff and stake holders to identify and take actions to ensure that RDP II complies with all the relevant national and provincial environmental legislations.
- Ensuring that the Environmental and Social Management Framework (ESMF) for RDP II is effectively managed and applied.
- Provide training on environmental safeguards, particularly on project social and environmental management procedures, exclusion activities, impacts screening and mitigation measures to Community Helpers, MAL staff, provincial government and other relevant stake holders...
- The key activities that the EO is required to carry out or take lead task include:
  - .1 Check and verify Form 1 of the ESMF- Screen for Eligibility of Subproject, which would be prepared by Community Helpers in coordination with local government leaders
  - .2 Participate or conduct Site Assessment. Prepare SITE ASSESSMENT SUMMARY for provincial-led subprojects;
  - .3 Provide training for Community Helpers and Community leaders in carrying out Site Assessment for community-led subprojects. Check/verify the Site Assessment Summary prepared for community-led investments.
  - .4 Discuss with, and get agreement with the Engineers/Community Helpers on the mitigation measures determined based on site assessment results. The EO is expected to visit the sites having higher risks or subprojects having sensitive socio-environmental issues
  - .5 Review and verify Environmental check list, ECOPs, EMPs of subprojects
  - .6 Briefing the Engineers on project safeguard management procedures, the requirements to incorporate mitigation measures into engineering design, and consultation with communities about detailed engineering design/scope of investment.
  - .7 Monitor the integration of mitigation measures into engineering design, construction contracts, agreements with communities, and other relevant project documents
  - .8 Visit selected subprojects during construction phase, particularly those having higher socio-environmental risks, to observe the actual socio-environmental impacts occurred during construction phase, the effectiveness of the mitigation measures applied, and instruct relevant stake holders to carry out corrective action as and when necessary.
  - .9 Carry out post-construction environmental auditing for selected completed subproject
  - .10 Prepare environmental section in project progress reports and submit to the Project Coordinator/Team Leader for incorporation into the Project's six-monthly Progress Report

### Key Deliverables

- Systematic filing of sub-project safeguard documents prepared/required by the ESMF
- Training materials prepared for training
- Field Trip Environmental Notes, including observations, recommendations and agreements
- Environmental Sections in Project Progress Report

**Duration of contract**

Two years, full time with an option to extend based on satisfactory performance.

**Required Qualifications and Experience**

- BSc/Diploma in natural science, environmental science/management or related field
- At least five years of work experience, including environmental impact assessment and an understanding of social impact assessment
- Have a good understanding of environmental management legislations and requirements in Solomon Islands
- Prior work experience in WB/internationally-funded projects will be advantage
- Have strong willingness and capability to travel frequently to the provinces for site visits
- Computer literate in MS Word and Excel. Additional computer skills would be an advantage

## **Annex 7 – Draft Pest Management Plan**



**MINISTRY OF AGRICULTURE AND LIVESTOCK**

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**SOLOMON ISLANDS**

**RURAL DEVELOPMENT PROGRAM Phase 2**

**(RDP II)**

**ENVIRONMENTAL AND SOCIAL MANAGEMENT**

**FRAMEWORK**

**(ESMF)**

August 2014

**INTEGRATED PEST MANAGEMENT PLAN**

**(IPMP)**

## List of Acronyms

ACIAR	-	Australian Centre for International Agricultural Research	
APSD		Asia Pacific Sustainable Development	
BC		Biological Control	
BT		Bacillus thuringiensis	
CCIL		Cocoa Coconut Institute Limited (PNG)	
CCP		Cluster Caterpillar	
CLIP		Cocoa Livelihoods Improvement Project	
CPB		Cocoa Pod Borer	
DBM		Diamond Back Moth	
DBRTC	-	Don Bosco Rural Training Centre	
EMSF		Environmental Management and Social Framework	
EU		European Union	
FAF		Fiji Collage of Agriculture	
FFS		Farmer Field Schools	
GAS		Giant African Snail	
GFFS		Gwaunafiu Farmer Field School	
GPPOL	-	Guadalcanal Plain Palm Oil Limited	
KGA		Kastom Gaden Association	
IDA		International Development Association	
IFAD		International Fund for Agricultural Development	
IPDM		Integrated Pest & Disease Management	
IPM		Integrated Pest Management	
IPPSI		Improved Plant Protection in Solomon Islands	
LCM		Large Cabbage Moth	
MAL		Ministry of Agriculture and Livestock	
MTDS		Medium Term Development Strategy	
NARI		National Agricultural Research Institute (PNG)	
NGO		Non Government Organization	
NRRDP	-	National Rural Rice Development Program	
PAR		Participatory Action Research	
PNG		Papua New Guinea	
PRAC		Pesticide Registration Advisory Committee	
PS		Permanent Secretary	
RDP		Rural Development Program	
ROC		Republic of China	
SEF		Supplemental Equity Facility	
SCI		Santa Cruz Island	
SRI		Systems of Rice Intensification	
SI		Solomon Islands	
SICHE		Solomon Islands Collage of higher Education (now Solomon Islands National University)	
SIG		Solomon Island Government	
SPC		Secretariat of the Pacific Community	
TB		Taro Beetle	
TTM		Taiwan Technical Mission	
WB		World Bank	



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## 1.0 INTRODUCTION

This Integrated Pest Management Plan (IPMP) provides a framework for ensuring that the Component 2 of the Solomon Islands Rural Development Program II (RDP II) supports environmentally sound pest management procedures. It directly addresses World Bank Policy OD/OP 4.09: Pest Management, and constitutes Annex 8 of the Environmental Management and Social Framework (EMSF) for the project.

The Component 2 of the Solomon Islands Rural Development Program is executed by the Ministry of Agriculture and Livestock with funding from the International Development Association (IDA) and the International Fund for Agricultural Development (IFAD), DFAT/Australian Aid, European Union and the Solomon Islands Government (SIG). The Ministry of Agriculture and Livestock (MAL) will have a monitoring and coordinating function at the national level.

### 1.1 Project Overview

RDP II is one of the Government's programs contributing towards the goals of Solomon Islands Medium Term Development Strategy (MTDS), together with activities supported by other development partners in the sector. The objective of Component 2 (C2) is to enhance rural livelihoods through diversification and commercialization of agricultural production. In doing so, RDP C2 would address the Solomon Islands' national objectives of poverty reduction and inclusive economic growth whilst improving the enabling environment for rural-based agricultural economic activity.

Given their strategic importance for the rural economy and rural households cocoa and coconut industries will be the main focus of the RDP C2, however other small and emerging industries such as small livestock, honey, coffee, and food crops could also be supported. Within those two major and other potential industries, the proposed RDP C2 would provide, over several years, the predictable and continued support required to implement some of the structural changes necessary to improve their performance and sustainability — and maintain their competitiveness in global markets- by strengthening core institutions and improving the delivery of support services and infrastructure for smallholders.

The **development objective** of Component 2 of RDP II is to enhance rural livelihoods through diversification and commercialization of agricultural production. In doing so, Component 2 would address the Solomon Islands' national objectives of poverty reduction and inclusive economic growth whilst improving the enabling environment for rural-based agricultural economic activity. Component 2 would include four linked sub-components:

- Sub-Component 2.1: Agribusiness Partnerships
- Sub-Component 2.1: Supplemental Equity Facility
- Sub-Component 2.3: Agricultural Commercialization
- Sub-Component 2.4: Agribusiness Support

**Sub-Component 2.1: Agribusiness Partnerships.** The concept of supporting productive alliances between private sector agribusinesses and smallholder farmers is modelled on successful programmes of this nature in PNG and elsewhere. The expected result is “partnerships between farmers and agribusinesses that facilitate increased production and marketing of agricultural commodities”. Such partnerships involve a package embracing provision of finance in concert with business development services, market linkages, capacity building and policy/institutional support. Partnerships are intended to facilitate productive alliances between agribusiness, farmers and other value chain actors. To be eligible for RDP II support, these partnerships must engage smallholders and assist them to improve their productivity and connection to markets. Partnerships may also include agricultural input suppliers, traders, agents, financial institutions, service providers, government agencies, NGOs, CSOs, transporters, processors, exporters and end-users. Partnerships may be based on any one or more agricultural or livestock commodities, but it is envisaged that many would focus on improving productivity and value addition in the value chains for the major cash crops, cocoa and coconuts.

**Sub-component 2.2: Supplemental Equity Facility (SEF).** RDP II would re-activate the SEF which was created under RDP I. The SEF is a financial instrument which aims to stimulate agribusiness activity in rural areas. The expected result is “improved access to finance which enables SMEs operating in the agriculture sector to increase turnover and employment”. The facility would be accessed through the commercial banks for projects in which the owner contributes 20% of the cost, and the bank is prepared to lend 60%. The remaining 20% will be financed by a SEF grant to the borrower. Under RDP II the SEF eligibility criteria would be directed towards financing agribusiness enterprises (broadly defined, including primary production as well as upstream and downstream activities) rather than any business undertaking in rural areas. Preference will be given to projects that create employment in rural areas and promote the integration of smallholder farmers into agricultural value chains. SEF recipients would also be eligible to access RDP-funded business development services that will enhance their prospects of success.

**Sub-Component 2.3: Agricultural Commercialization.** This Sub-Component would support MAL efforts to strengthen the enabling environment for development of the agricultural sector through direct engagement and support for farmer groups, improved industry coordination, capacity building and adaptive research. The expected results are: (i) *“smallholder farmers and farmer organizations assisted to diversify and commercialize agricultural activities”*; (ii) *“multi-stakeholder agribusiness industry councils effectively coordinate implementation of their sector strategies”*; and (iii) *“enhanced capacity of MAL to provide strengthened services through industry and market linkages”*. The programme would extend the RDP I practice of implementing provincial and ward-level activities which directly engage with and support farmer groups, whether formally constituted or not. The focus would be on diversification and commercialization, and the period of engagement would extend over 1-2 years per group. The existing cocoa and coconut industry committees would be supported by the creation of an Industry Councils Secretariat with a budget to finance general administration, meetings, conferences, studies and consultancies. Beyond the life of RDP II, the Secretariat is expected to be financed by the Industry Councils themselves. The Programme would also support MAL restructuring and capacity building through training staff for new responsibilities in agribusiness, marketing, economics and M&E; as well as in-service training for MAL extension personnel in agro-processing and quality assurance. There would also be support for adaptive research and demonstrations including Participatory Action Research (PAR) sites for cocoa, cocoa

variety testing and selection, coconut seed gardens, and a twinning arrangement with the PNG Cocoa and Coconut Research Institute (CCIL).

**Sub-Component 2.4: Agriculture and livestock disaster recovery and resilience.** Will help to replace agriculture and livestock assets (in particular, pigs and poultry), repair or replace agriculture and livestock infrastructure, and rehabilitate inundated commercial farming blocks (cocoa, in particular) in Guadalcanal communities affected by the April 2014 flash floods. This activity will also develop and deliver training and awareness building materials on climate and disaster resilient farming practices to farmers in all provinces through MAL's extension services.

**Sub-Component 2.5: Agribusiness Support.** The expanded role of agriculture in RDP II justifies the creation of a Component 2 Management Unit to be based in MAL with a mandate to coordinate and manage the implementation of Component 2.

## 1.2 Sector Background

Solomon Island (SI) has a population of a 515,000 (2009 census) of which over 80% are involved in agriculture. Total land area of 27,900 Km<sup>2</sup> of which only about 3% is used for agriculture and devoted to arable and permanent crops. Apart from Guadalcanal plains, most of the land is mountainous with pockets of undulating hills and flat lands in various locations, where most of agricultural activities take place.

Coconut, oil palm and cocoa are major permanent crops and form major agricultural exports, although forestry and fisheries supersede them. Sweet potato, taro, yam, cassava slippery kabis (Aibika), Chinese cabbage, pawpaw, beans, watermelons, cucumber, spring onion, capsicum peppers and chilli and local vegetables are cultivated for subsistence and income generation. Rice has been promoted by MAL and TTM under the National Rice Program and is grown by a few groups of farmers in the country.

SI although, still free from many of the serious pests, does have a few very destructive ones, and the risks of new introductions are increasing with increase in traffic flow and frequently travelling of people, within and outside the region. Currently, no pesticides are used on the major cash crops except oil palm. For food crops the increasing populations and rising standard of living demand an intensification of agriculture in order to obtain higher yields per area of land. This often leads to monoculture conditions which magnify the soil nutrients and pest problems; therefore, inputs for soil fertility and pest control measures are becoming more important. The move from traditional farming has required interventions and adoption of new techniques of farming. In the past pest control measures were purely based on cultural, physical or natural means some farmers are now using chemicals for the commercial production of food crops.

Number of small holder commercial vegetable and root crop farms are located and increasing in numbers around Honiara and Auki meeting the demands of growing urban and peri-urban populations in these areas. The cropping systems do not vary much. All do mix cropping. There are no farms or farmers who grow only one crop, but few farmers at Kakara in Malaita can be classified as specialist watermelon farmers, who grow them entirely for sale, but will also grow other crops for family use and sell the surplus together with watermelons. In Honiara and Auki, farms nearer to the

town centres do intensive farming due to restricted farming area. In such areas, although crops are rotated, they are grown continuously, with limited fallow periods or in some cases no fallows at all. In the outer peripheries, where farms are larger in size, cropped areas can be left fallow after each crop and for longer periods. Some farmers who have plenty of land area shift their crops to new areas every season. In all cases taro is always shifted to new areas or into virgin land due the problem of taro beetle infestation. In the peri-urban farms agro-inputs of fertilizers and pesticides are commonly used.

Insects are the major pests and evenly distributed all year round while fungal diseases are sporadic, but can cause huge problem especially after heavy rains. Few of the bacterial diseases occasionally cause severe losses of crops, mostly as post-harvest problems. Nematodes are known to exist, but these are not considered as pests although heavy losses could occur from their infections as on taro in Rennell. Most of the farms also suffer from weeds, although their adversities are not measured. Weeds are normally controlled manually except in oil palm plantation where herbicides are used.

Farmers around Honiara and Auki use available pesticides, mostly insecticides, from the local pesticide retailers on a regular basis. However, the range of pesticides available in SI is limited and their usage usually fails to control the targeted pests. Therefore, farmers struggle to manage the crop pests and heavy losses of crops occur.

In the outer provinces, although the crops significantly suffer from pests, pesticides are hardly used. There are no pesticide outlets, other than the health services malaria vector control unit, which provides icon (Lambda-Cyhalothrin) for mosquito control. In the outer provinces pest control is mostly dependent on crop rotation, shift cultivation (for control of taro beetle) and recently in some cases use of Plant Derived Pesticides (PDPs) on vegetables. Organic agriculture using composts, PDPs and other locally available products, crop rotation, physical and other non chemical methods are promoted to farming communities by some of the established NGOs such as Kastom Gaden Association (KGA), Gwaunafiu Farmer Field School (GFFS), Asia Pacific Sustainable Development (APSD) and others. Alongside MAL also promotes and emphasizes on good crop health and non-chemical methods of crop production. Despite all these it is difficult to quantify organic production or separate them from the subsistence farm systems.

In many of the rural and remote areas farmers have not used pesticides. Farmers were given pesticides for pest control on rice. Malaria control pesticides are available at most of the medical centres. Many farmers who know the benefits of pesticides use them on their crops and obtain from any source.

### **1.3 IPMP Focus**

The IPMP<sup>5</sup> has been prepared to address the requirements of the World Bank OP's 4.09 Integrated Pest Management and, consistent with the RDP II design, focuses on the smallholder sector. However, other direct and indirect issues are also addressed, such as implications of partnerships with plantations, agrochemical runoff effects, etc.

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<sup>5</sup> It should be noted that although the term integrated pest and disease management (IPDM) has been adopted by most PNG research institutions, the term IPM, adopted by the World Bank, is interpreted as all encompassing and of the same meaning for the purposes of this document.

## **2.0 POLICY, REGULATORY FRAMEWORK AND INSTITUTIONAL CAPACITY**

### **2.1 Conventions regarding Agrochemicals**

Solomon Islands is a member of the Governing Council of the United Nations Environment Program, and it has membership to a number of international and regional treaties and conventions relating to the environment, including a number that relate specifically to the control of hazardous substances:

- Rotterdam convention
- Stockholm convention<sup>6</sup>
- Montreal convention

### **2.2 SI Pesticides Legislation and Control**

Pesticides control of distribution and use in SI is regulated under “The Safety at Work (Pesticide) Regulations 1982” which is administered by MAL.

The act requires that no pesticide maybe imported, used, or offered for sale unless it has been registered with the Registrar. The pesticide registration is governed by Pesticide Registration Advisory Committee (PRAC) which comprises of:

Senior Government Officer responsible for Agriculture (understood to be PS of MAL), who shall be the chairman:

The Registrar (assumed to be the Director of Research), who shall be secretary

Public Officers from:

- Government Pharmacy
- Government Officer concerned with industrial safety
- Government scientist concerned with plant protection
- Public Officers concerned with public health and environment protection, and
- Not more than 3 other public officers appointed by the Minister.

The aim of PRAC is to advise and make recommendations on all aspects of pesticide registration process to the Registrar.

Under the act, the Registrar is given the powers to:

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<sup>6</sup> Annex 1 lists the chemicals under the Stockholm and Rotterdam Conventions.

- Register pesticide with or without conditions
- Refuse registration
- Require label changes on registered pesticides
- Cancel a registration

The framework of the current pesticide regulation has sufficient control on importation, distribution, sales and use of pesticides in SI. The PRAC was been inactive for a number of years and was reactivated under RDP phase I and is in the process of registering a number of pesticides.

## **2.3 Policy and Organizational Issues**

Currently in SI there is no over-arching government policy or strategies for integrated pest management (IPM) promotion or implementation. However, MAL has a policy on organic agriculture and an extension policy under which it operates and makes its annual work plan.

Pest management activities are under MAL's Research and Development programme with all staff based in Honiara. There is qualified and trained plant pathologist and entomologist. Pest management technical staff either have diploma or certificate in general agriculture from Solomon Islands College of Higher Education (SICHE) and Fiji College of Agriculture (FCA) and a few of them have had attachment training at organisations such as SPC on basic pest management.

Crop Health staff only have access to limited laboratories facilities with some basic equipment and limited fields to conduct experiments. Capacities on pest management in the provinces are very scanty. More basic training on pest identification, symptoms of damage and on interventions is needed, but this needs a more inputs of expertise and resources to the efforts of the local staff. Field staff require information and know-how on pest management so that they can better advice the farmers.

There is no policy on ecologically based pest management and farmers have no access to information. There are no incentive based schemes to promote alternatives to conventional pesticide uses. Staff within the extension service desperately requires training and capacity building in all areas, including IPM.

## **2.4 Institutional Arrangements and Collaboration**

As the IPMP will be an integral part of the of all the products that could potentially be funded under RDP II, capacity building activities would be carried out under Component 2 of the RDP II.

Apart from for cocoa there is currently no proper IPMP in place for the other industries, in SI although recommended procedures for production provide examples of IPM techniques already in practice. For cocoa the IPDM approach consisting of six steps manual weeding, pruning height and canopy control, shade management, black pod removal and burial and regular harvesting.

MAL's Research and Development programme are tasked with solving pest management issues and as mentioned above has limited capacity and facilities to deal with normal basic pest management problems. The MAL Biosecurity department has capacity to conduct pest surveillance programs. Collaboration with regional organisations such as SPC, PNG NARI, PNG CCIL, ACIAR are called on to assist MAL with pest management where required.



## 3.0 PESTS AND DISEASES

There are a number of pest problems (insects, mites, diseases, weeds, mollusks, rodents and vectors of diseases) which hinder crop development and production in SI. Insect and mite pests are problem all year round, while diseases can be seasonal or in some cases continuous problem to crops. As usual of tropical agriculture, weeds are mostly underestimated as pests. Incursions of Giant African Snail (GAS) in Honiara and crazy ant on Reef Island now pose added new pest problems and bring an extra burden to pest management approaches. There is a risk of these two pests escaping to other islands in SI and anticipated to cause more problems to farmers and agricultural development. Cocoa pod borer (CPB), which is now present in Bougainville, is looming to get into SI, especially to the neighbouring regions, Shortland and Choiseul, if precautionary steps are not taken to prevent its introduction. Cyclic outbreaks of pests, like the coconut leaf miner on Santa Cruz keep occurring and needs constant attention. Rodents are a problem in weedy fields and where farm sanitation is neglected.

The following crops are economically important at subsistence, semi-subsistence and commercial farming systems.

The following briefly discusses the current and anticipated future impact of the pests on each of these crops:

### 3.1 Cocoa

The major constraint to cocoa production in the Solomon Islands is cocoa black pod disease is the major disease. MAL has an Integrated Pest and Disease Management (IPDM) program in operation with emphasis on proper plantation management and field sanitation, which reduced the incidences of cocoa black pod disease. Fungicides are not used on cocoa in SI. IPDM in cocoa is a good example of holistic and participatory approaches of crop pest management. There is a real threat that of cocoa pod borer may enter SI from PNG this would have a serious impact on cocoa production in the country as it has had in PNG. The control method for cocoa pod borer is mainly through best management practices incorporating IPDM, regular harvesting and crop hygiene, however, insecticides may be required on in certain situations.

### 3.2 Coconut

There are a number of pests that affect coconuts in SI including the coconut leaf miner (*Promecotheca* spp) is a serious pest of coconuts which has cyclic outbreaks reducing production. Recent outbreak of the pest on Santa Cruz Island was in 2007 and bedraggled appearance of the coconut palms caused alarms amongst the communities. Previous studies have shown that there are natural enemies present on SCI. The natural enemies were recently collected by SPC and the parasitoid was identified as *Pediobus parvulus*, known to keep the pest under control in the Pacific islands where it is present. It has been reported that the infested coconut palms were recovering. It seems that the parasitoid is slowly coming back and contributing towards the reduction in populations of the pest.

It is not economic and often not practical to use pesticides on coconuts and currently no pesticides or fertilisers are used on coconuts in SI.

### 3.3 Oil Palm

Oil palm plantation is a private enterprise owned and operated by the Guadalcanal Plains Palm Oil Limited (GPPOL) which is the largest user of herbicides in SI. Only 2 herbicides, *Paraquat* and *Glyphosate*, are used at the plantations to manage weeds. GPPOL has an organized use of herbicides with facilities for storing, mixing and washing room for the pesticide applicators. According to the Plantation Manager, use of *Paraquat* will be phasing out soon and only *Glyphosate* will be used with alternative methods of weed management such as planting of legumes to smother weeds and to improve soil fertility in the plantations. Application of the herbicides is mostly carried out by women. It was noted that women sprayed *Paraquat*, but did not have the

protective clothing on them, although they were provided by the company. It appears that the importance of the protective clothing is not well understood by the people; therefore, it is recommended that training programmes are conducted on the importance of pesticide safety and self protection when handling pesticides. *Paraquat* is a toxic pesticide and appropriate safety procedures should be in place on its use.

### 3.4 Rice

Rice has been grown in SI for many years and once it used to be commercially produced in the Guadalcanal Plains. The Republic of China (ROC) Taiwan Technical Mission (TTM) has been in SI for over 25 years promoting small-holder and commercial rice production systems. TTM in its rice development program supplied pesticides, fertilizers and other farm inputs, and installed rice mills for rice communities at different locations all over SI. SI government under the National Rural Rice Development Program (NRRDP) is encouraging rice production for subsistence and income generation for the rural farming communities.

The main devastating pests of rice in SI are brown plant hopper and leaf roller. Current control measures for rice pests rely exclusively on prophylactic insecticide applications which cause serious economic and environmental problems. The composition of rice pests and their natural enemies in rice fields in SI is inadequately known. If there are natural enemies then the continued excessive use of broad-spectrum insecticides create an inappropriate environment for the establishment of biological control agents. Both field staff and farmers are unacquainted with the concepts and benefits of IPM. Inadequate understanding by the field staff and farmers of the prescriptive rice IPM packages and a lack of understanding of the specific pest-natural enemy complexes and use of ineffective insecticide cause crop failures.

Under NRRDP training and promotion of System of Rice Intensification (SRI) has been conducted for the rice field officers and farmers. SRI is an organic system for growing rice which works very well in established production systems in Indonesia and other rice growing countries around the world which may also work for smallholder rice farmers in SI. However, rice production systems in these countries differ a lot. For example Indonesia rice production systems are well developed with proper irrigation and mostly on flat lands compared to SI rice farms mostly are upland and rain fed. The basic requirements of rice farming are water and good land preparation. Inception of such program must take cohesive approaches so that they are fully utilised.

### **3.5 Slippery *kabis* or *aibika* or *bele* (*Abelmoschus manihot*)**

This is the most common green leafy vegetable in Honiara and the other markets around the country. The flea beetle (*Nisotra basellae*) is most serious pest which perforates leaves and makes them unmarketable. In some places flea beetle damage is so high that farmers have stopped growing the crop. Shoot borer (*Earias vitella*) caterpillars feed inside the shoot stems which cause wilting and death of plant under rainy conditions. It also attacks other related plant species such as hibiscus, okra, cotton and occasionally on tomatoes.

In Auki and Honiara where insecticides are available farmers heavily rely on these for control of both insects. Bioagents of the flea beetle is not known. There are a few bioagents of the shoot borer and if the insecticides are used judiciously then they will have better chance of exerting in enough control. Early detection of pest infestations and removing of damage tips may greatly contribute towards shoot borer management. Slippery *kabis* under shady conditions do not attract as much damage from the flea beetle. There is good opportunity to develop IPM programme for slippery *kabis* with better understanding of the flea pest.

### **3.6 Chinese and ball (head) cabbages**

Both, Chinese and ball cabbages are attacked by diamondback moth (DBM), large cabbage moth (LCM), cluster caterpillar (CCP), and occasionally by centre grub. Chinese cabbage is second most important leaf vegetable in SI and is usually sprayed with *Orthene* and *Karate* for control of the pests in Honiara and Auki. Chinese cabbages are harvested early to avoid insect damages. Ball cabbages are rarely seen in the markets in SI, but whatever is sold are of low quality and very expensive. Severe insect damages have discouraged farmers in growing of ball cabbage.

Chinese and ball cabbages have great potential to develop IPM by utilising the outputs of the ACIAR funded 'Integrated pest management in a sustainable production system for Brassica crops in Fiji and Samoa'. This project carried out studies on better understand the cabbage pest -natural enemy complexes; avoidance of prophylactic uses of broad-spectrum insecticides and development and implementation of FFS.

### **3.7 Watercress**

Watercress is grown on water rafts in the Mamara creek near Honiara and often is attacked by DBM, LCM and CCP. *Karate*, *Orthene* and presumably other insecticides are often used for the control of these pests. Cultural practice such as submerging of the water rafts may be used to reduce the pest population, this, however, needs to be adequately tested before recommendations can be made.

### **3.8 Taro**

Taro beetle (TB) is the major constraint of taro production in SI. On Santa Cruz taro farmers are using the SPC recommended insecticide *imidacloprid* and comparatively producing good taro. The farmers on Santa Cruz, however, have not fully adopted the practice as recommended by SPC. The farmers are not clear on the rates and frequency of applications, safety and alternating applications of *imidacloprid* and *bifenthrin*.

The technology on use of the insecticides against TB is not fully grasped, therefore, posing problem resistance development and other pesticide related problems. It is highly recommended that the use of insecticides, *imidacloprid* and *bifenthrin*, be fully demonstrated to taro grower in active participatory approach in sustainable taro production system.

### 3.9 Sweet potatoes

Sweet potatoes have a number of insects such as leaf eating beetle (*Monolepta semiviolacea*), tortoise beetle (*Cassida papuana*), hornworm (*Agrius convolvuli*), leaf folder (*Herpetogramma hipponalis*) and sweet potato weevil (*Cylas formicarius*) infestations. Few natural enemies keep these insects under control. Market gardeners especially in the Burns Creek area spray insecticides. Among the diseases, sweet potato scab is most common. Sweet potato scab disease resistant varieties in rotation with other crops are encouraged to avoid severe losses of yields.

### 3.10 Beans

Yard long beans common vegetable and cash crop to many farmers in Honiara and other markets in SI. The bean pod-sucking bug (*Riptortus serripes*) is the most serious pest which sucks out young developing pods. In Honiara insecticides *Orthene* and *karate* are often sprayed to control the pest. Lipstick plant (*Bixa* sp.) is suggested to attract the pod sucking bug and leave the beans and seems few famers in Malaita are using this plant to manage the sucking bug. Mulching may also help in management of these bugs.

Bean pod borer (*Maruca vitrata*) cause extensive damage to developing pods and make them unmarketable. Insecticides like *Orthene* etc are used, but timing of application is important in order to be effective.

Beans are often infested with leafminer (*Liriomyza* sp.) and are sprayed with insecticides. Leafminers are usually problem in fields which are sprayed with insecticides killing natural enemies, which if undisturbed keep the pest under control. Bean rust (*Uromyces* sp.) is common disease on bean leaves which cause leaves to fall therefore reducing production. Protectant fungicides such as *Borrek* (Chlorothalonil) or *axiom* (Mancozeb) are used for the control of the rust.

There are a number of options for management of bean pests available which provide ideal opportunity to develop IPM approaches.

### 3.11 Cucurbits

Cucurbits (water melon, pumpkin, cucumber, lufa) are commonly attacked by insect pests such as pumpkin beetle (*Aulacophora similis*) and cucumber moth (*Diaphania indica*) with occasional infestations of aphids, ladybird beetle, mites and leaf miners can be experienced. *Orthene* and other cheaper insecticides available are used in Honiara and Malaita.

Gummy stem blight (*Didymella bryoniae*) and powdery mildew (*Erysiphe cicharacearum*) are sometimes sprayed with *Borrek* or *axiom*.

Fruit flies which have data on should be mentioned. Presence of fruit flies is a hindrance to fruits vegetable export and loss in food security and income. The use of lures and bagging of fruit can be used to help minimise the damage from fruit flies.

### **3.12 Giant African Snail (GAS)**

GAS has recently invaded Honiara. Upon its interception at the Ranadi industrial area, MAL's quarantine services put up containment measures for eradication of the pest. Blitzem pellet was applied to the infested area and all stages of GAS were collected and destroyed under the supervision of quarantine. Despite these efforts, GAS is breeding prolifically and is spreading in most of the urban and peri-urban areas of Honiara. Its spread into inaccessible areas makes more difficult to reach, hence difficult for physical collections and application of Blitzem pellets. In its current situation it is difficult to eradicate the pest. Therefore, the plan of action from eradication should now be changed to management and taking appropriate actions to reduce the pest population so that the risk of it spreading to other provinces is reduced.

### **3.13 The Yellow Crazy Ant, *Anoplolepis gracilipes***

The yellow crazy ant has been introduced across the tropics as a by-product of human commerce. It is capable of invading both disturbed and undisturbed habitats, including tropical urban areas, plantations, grassland, savannah, woodland, and rainforest. The Invasive Species Specialist Group has identified the ant as among 100 of the "World worst" invaders. Thus, any invasion by this ant species may have large, catastrophic consequences. Such impacts include decimation and rapid degradation of endemics and communities and possible radical disruption of ecosystems. Dispersal and invasion pathways to new locations by these ants are via translocation in packaging material, shipments of produce, timber, dunnage, plants and pallets, etc.

At present the ant is located on the Reef Islands only, but has potential to spread to other places in SI. It is vital that measures must be taken to reduce the populations so as to reduce the risk of further spread. Visit to Reef Island was not possible; therefore, it is difficult to gauge the magnitude of the ant problem. However, quarantine and other measures are essential to address the ant problem on the Reef Island. Chemical and ant bait were used to control and containment purpose. Lack of resources is also affecting progress. Bait has to be imported from Australia.

### **3.14 Current and proposed pest management practices**

The current practices at the 3 different levels of farming vary;

At subsistence level, farmers hardly use any pest management interventions and largely are dependent on crop rotations, shift cultivation, or use of resistant varieties recommended by MAL e.g., resistant sweet potatoes varieties against the sweet potato scab disease or yam varieties against the anthracnose disease. Although the resistant varieties may not be favoured by the communities, there is no choice but to grow them. Despite significant losses of crops, subsistence farmers do not use pesticides because they are either not available in the rural areas or not affordable.

Semi-commercial farmers who grow crops both for their use and sale, often do not use any pesticides, but are dependent on cultural practices of pest management. Some of these farmers do use pesticides, which they can afford to buy from their crop sales.

Commercial vegetable farmers are largely dependent on pesticides for pest control and often applications are on weekly basis or in some cases more regularly. Farmers, who cannot control pests on crops stop growing those crops.

For the tree crops, cocoa coconut oil palm coffee and fruits and nuts, currently pesticides are only used in oil palm production. Insecticides may be occasionally necessary for cocoa if there is an outbreak of cocoa pod borer in the country.

There are a number of non government organisations (NGOs), such as Kastom Gaden Association (KGA), Asia Pacific Sustainable Development (APSD), Gwaunafiu Farmer Field School (GFFS), and others who are involved in organic agriculture. These organisations get small grants from donors and programmes for promotion of organic farming, through outreaches and training programmes. These and other relevant NGOs are very vocal on organic agriculture movements and as a result recently organic agriculture policy was formulated and implemented. Generally speaking all subsistence farming can be put into organic farming. In the rural communities farming practices pesticides never featured before expansion of rice programmes to such places.

NGOs do, however, realize that organic methods of agriculture are not entirely possible with farming practices where pests are continuously causing problems under intensive cultivation. In such places a more realistic integrated approaches such as IPM is necessary. Therefore, for the future IPM developments and implementations should take place to prevent the misuses of pesticides.

## **4.0 CURRENT PESTICIDE USE AND MANAGEMENT**

Agricultural development and trans-boundary measurements need interventions such as use of pesticides. A developing country like SI needs a determined, focused and continuous effort to increase agricultural production. Therefore, judicious uses of pesticides play an important role in improvement of agricultural services and sustainable management in improving livelihoods of the rural communities. Annex 2 gives a list of pesticides available and their uses in SI.

The current usages of pesticides are mostly restricted to the oil palm plantation and commercial vegetable farms under intensive cultivation in Honiara and Auki. There are no or very limited usage of pesticides in the outer provinces although crops face heavy losses from pests. This is so because pesticides are not available in the outer provinces and are unaffordable. Farmers who are desperate to use pesticides in the outer provinces obtain them from Honiara. Few farmers also use *icon*, the insecticide used for control of mosquitoes and supplied by the vector control unit of Government Health Services.

The intensification of agricultural production systems, especially around Honiara and Auki, there will be increased usage of pesticides for food production to meet the growing demands from the urban and peri-urban populations.

There are three major sources of pesticides: Island Enterprise Limited is local hardware company which sells pesticide imported from New Zealand, Australia and PNG; Farmset Limited is a PNG hardware business and get most of the pesticides from its parent company in PNG, it also is the main supplier of pesticide to GPPOL; TTM also imports a range of pesticides from Taiwan and sells to farmers together with vegetable and other seeds. All pesticides imported are ready-to-use formulations, packed and labelled from overseas. Vector control against malaria is undertaken by Ministry of Health and Medical Services (MHMS), generally using *icon* (Lambda-cyhalothrin) and Permethrin for impregnating bed nets. MOH also uses Malathion for control of dengue fever mosquitoes. Listed below are the common pesticides available in SI and their uses on crops.

The pesticides available in SI are listed according to the WHO toxicity and hazard classification is shown in Annex 3.

All the farmers who use pesticides for crop pest control use them on calendar basis, irrespective of the pests are causing damage or not. There is no IPM programme currently in operation; therefore, no pesticides are used in IPM context. Most of the pesticides available to farmers are broad-spectrum and many are ineffective on the target pests. Farmers don't have the knowledge of pests and natural enemies of their crops, therefore, in some cases the unscrupulous use of the pesticides are causing more problem than good to the farmers. For example use of Orthene against Brown Plant Hopper on rice crops failed to control the pests and farmers losing more than 3 hectares of rice crop in Fiu on Malaita. A Kakara watermelon farmer sprays Carbaryl every week for control of pumpkin beetle. The farmer doesn't know the difference between the pest and natural enemy species of the beetles.

#### 4.1 Pesticides that may be required in RDP II

The need for the use of a pesticides and the type of pesticide will largely be dependent on the crop or product focus of productive partnership funded under RDP II. Intensification and the continuous growing of same crops in same land can lead to increased pest and disease pressures and soil fertility decline. To improve agricultural productive farmers need to have access to agricultural inputs. In some cases such as vegetable production it is envisaged that pesticide use may increase to manage the pests that constantly causes serious damages to crops production and quality.

Table 1: List of pesticides that may need to be purchased by RDP II – this is an indicative list only\*

Formulations	Common Names	Use
Delfin	Bacillus thuringiensis var. Kurstaki	Slippery kabis, cabbages, watercress, etc.
Xentari	Bacillus thuringiensis. var. aizawai	Slippery kabis, cabbages, watercress, etc.
Success	Spinosad	Slippery kabis, cabbages, watercress, etc.
Suncloprid/Mustang/Confidor	Imidacloprid	Taro beetle control
Bifenthrin	Bifenthrin	Slippery kabis, cabbages, watercress, etc.
Steward	Indoxacarb	Caterpillars of various crops
Prevathon	Rynaxphyr	Slippery kabis, water melons, cabbages, etc.
Force	Cyfluthrin	Taro beetle

Kopi	Copper oxychloride	For use on vegetables against bacterial spots
Glyphosate	Glyphosate	For weed control
Karate	Lambda-cyhalothrin	For cocoa pod borer control if necessary for cocoa

\* The need for the use of a pesticides and the type of pesticide will largely be dependent on the crop or product focus of productive partnership funded under RDP II

Pesticide use is an integral part of pest control system in the crop development programmes, such as in the rice expansion programme to the rural communities. Overuses of pesticides are usually the case as a pre-emptive measure, without considering recommended doses or synergetic effects.

Some farmers have used pesticides for a long time, but they lack the know-how to handle them properly. There has been no study or data to measure pesticide effects on the farming community health. To avoid risks, that the appropriate pesticide should be applied in correct amounts, at the right time, and with appropriate precautions in terms of storage, preparation and application, and the cleaning of equipment. There is a scientific consensus that the effects of an inappropriate use of pesticides can seriously affect human health and the environment.

## 5.0 CURRENT IPM PRACTICE

### 5.1 General IPM principles

IPM consists of a set of interventions that all together result in reduction of pest incidence to low and acceptable levels with minimal possible negative impact on natural ecosystems, non-targeted pests and the environment. Generally, components of IPM are the following:

1- Cultural practices — good farm management:

- Frequent, complete harvesting
- Sanitation
- Pruning of trees or plants and shade trees
- Weed management;

2- Planting materials resistant/tolerant to major pests and diseases;

3- Biological control of pests and diseases if available;

4- If required the rational pesticide utilization (minimal, efficient and safe use of permitted pesticides).

### 5.2 Current IPM methods used in SI

There is no explicit IPM policy in SI, with the main control being focused on cultural practices - although the cocoa and oil palm industries provides an exception with an IPM practice. Cultural practices are often the first level of defence, with pest management strategies generally built upon them subsequently if required.



Regarding cocoa, SI farmers do not use any chemical inputs. If cocoa pod borer infestation was to occur in SI some cocoa farmers may start to use insecticides, usually lambda Cyhalothrin (Karate) and alternating it with Acelic (primiphos-methyl) and with cypermethrin or other synthetic pyrethroid to mitigate any possibility for the build up of resistance.

With regards to cocoa, currently small cocoa farmers in SI in majority do not manage their cocoa blocks with needed attention, therefore losses due to pests and diseases are high and productivity of cocoa trees is low and well below the potential. To address this problem, the Australian Aid project (Cocoa Livelihood Program) started in 2010 and introduced the cocoa Integrated Pest and Disease Management (IPDM)

PNG CCIL has breed and selected high yielding cocoa clones that are resistant to black pod disease caused by *Phytophthora palmivora* and Vascular Streak Dieback (VSD) (*Oncobasidium theobromae*) and are tolerant cocoa pod borer damage and now being widely used in PNG. Very low incidence of these two diseases and tolerance to CPB is observed in the field with very low losses of cocoa production. It is planned that RDP II will work with CCIL to import these clones for testing and distribution to farmers in SI.

## 6.0 PESTICIDE MANAGEMENT UNDER RDP II

It is essential that RDP II supports the development of knowledge and builds upon lessons already learned on IPM in SI. Little work has been conducted concerning biological control methods in SI — this is something that could be supported by the likes of ACIAR.

### 6.1 Occupational and Health Risks and Mitigation Measures

There is a need for much more emphasis by MAL on awareness and training of "best practice" methodologies so that the use of agrichemicals is minimised. Even where training has been given, some farmers do not always follow up and implement the practices.

IPM methods based on good cultural practices only do not entail chemicals and thus, there is no risk to farmers. However, when agrochemicals are adopted, such as may be required for CPB if it enters SI, or for commercial vegetable or rice production it is essential that farmers are made adequately aware and are taught proper procedures for the safe use, handling, application, storage and disposal of chemicals. This would include the use of face, nose, eyes, and body protection with appropriate covering, and personal hygiene to thoroughly wash hand and clothing after the application of the agrochemicals. Only permitted pesticides should be used in recommended quantity and frequency with appropriate application techniques and nozzles that assure the most efficient control of targeted insect with minimal quantity of insecticide used. By adhering to this, the incidence of pesticide poisoning could be minimized.

Trainer of trainer programs will be used to educate farmers within partnerships or activities where pesticides are used. MAL staff or other suitable qualified persons will be engaged to train trainers who will in turn train others on proper procedures for the safe use, handling, application, storage and disposal of chemicals. The coordination and cost of the training and the supplying of the application and safety equipment should be built into the partnership or activity funding.

## **6.2 Overview of Training and Human Resource Development**

Training of smallholder farmers on IPM is an integral part of RDP II activities for all enterprises covered under RDP II. Smallholder farmers need to know and understand how they can produce quality products while minimizing any negative impact on the environment.

### **6.3 Training of Farmers**

Under RDP II, farmers will be trained in best practice management and IPDM for the commodities or products they are producing. In addition, other modules that provide the farmers with other necessary skills to empower them to improve their farming enterprise will be encouraged and supported under RDP II. Other training modules could include:

- Basic Management
- Book Keeping
- Financial management
- Marketing
- Sustainable Livelihood

All these will be delivered through the various productive partnerships within Component 2 of RDP II. The cost of providing any training to farmers etc will be built into the budget for the partnerships or any other activity. This may include fees for training providers, independent consultants or the operational funding for MAL staff or staff from other Ministries where relevant.

Some partnerships may have the capacity to provide some or all of the training in-house but it is most likely that most will have to outsource the training. MAL and a few individual consultants have the capacity to deliver agricultural related training including IPM and pesticide safety and application. Other training like bookkeeping, financial management, marketing and sustainable livelihoods could be outsourced to other training providers such as SBEC (Small Business Enterprise Centre), MASE Business training Centre, SIDT and SINU

During community consultation, a number of sentiments were expressed about different modalities for the delivery of this training. Training on IPM would be conducted through a number of modalities, including on farm training ("training by association"), "farmer to farmer" approaches as currently being used by MAL for the cocoa PAR training, and other proven approaches. Excellent results were shown with good adoption rates from this training in only a short period of time.

In addition, farmers will be trained in a community setting and the use of the farmer field school approach will be actively encouraged. This would have the advantage of greater community spinoff and involvement. Training in dormitories is a more formal avenue of training which is often not popular with smallholder farmers who have various family and community obligations. It may be more appropriate for training of trainers.

Some farmer associations have been formed and they could be also sources to draw farmers from to attend the training.

The cost of providing any training to farmers etc will be built into the budget for the partnerships or any other activity. This may include fees for training providers, independent consultants or the operational funding for MAL staff or staff from other Ministries

## **7.0 MONITORING AND EVALUATION UNDER RDP II**

RDP II PCU will have a Environmental Officer (EO) to be engaged during the RDP II to monitor the programs environmental and social safeguards framework. It would be the responsibility of this TA to train the relevant staff in the Component 2 Project Management Unit (C2 PMU) (Component 2 coordinator, M&E Officers and any other staff involved in monitoring activities) and to routinely visit the partnerships and activities established under Component 2 of RDP II, and to report to the C2 PMU on any issues arising with the implementation of pest management practices under C2 RDP II.

### **7.1 Activities Requiring Monitoring**

The application of IPM measures are often done by the farmer as he or she is in control of their production methods, based on the training that has been given. The uptake of IPM by farmers would be confirmed through the project M&E activities, by observing a sample of farmers, who have attended the training and monitoring results from their farming blocks. The Environmental Officer and Component 2 Coordinator and M&E Officers in MAL would need to visit selected blocks to observe the application of IPM measures.

## ANNEX 1: LIST OF CHEMICALS UNDER STOCKHOLM & ROTTERDAM CONVENTIONS

Stockholm Convention	Rotterdam Convention
<b>Annex A</b>	<b>Pesticides</b>
aldrin	2,4,5-T
chlordane	aldrin
dieldrin	captafol
endrin	chlordane
heptachlor	chlordimeform
hexachlorobenzene	chlorobenzilate
mirex	DDT
toxaphene	dieldrin
polychlorinated biphenyls (PCB)	dinoseb and dinoseb salts
	1,2-dibromoethane (EDB)
	fluroacetamide
	HCH (mixed isomers)
	heptachlor
	hexachlorobenzene
	lindane
	certain mercury compounds
	pentachlorophenol
	certain hazardous pesticide formulations of
	methamidophos
	methyl-parathion
	monocrotophos
	phosphamidon
	parathion
	Industrial chemicals
	asbestos (crocidolite)
	polybrominated biphenyls (PBBs)
	polychlorinated byphenyls (PCBs)
	polychlorinated terphenyls (PCTs)
	tris (2,3-dibromopropyl) phosphate recently added
	include pesticides
	binapacryl
	toxaphene
	ethylene dichloride
	ethylene oxide
	DNOC and its salts
	All formulations of monocrotophos and parathion
	Certain formulations of benomyl, carbofuran and
	thiram

## ANNEX 2: LIST OF PESTICIDES AND THEIR USES ON CROPS IN SI

Pesticide formulations	Crops on which they are used	Pests on which they are used	Remarks
<b>Insecticides</b>			
Abamectin 0.15%EC	Beans, Cabbages, Watermelons	Aphids, Whiteflies, mites	Abamectin is gram positive branching bacteria, <i>Streptomyces avermitilis</i>
Carbaryl	Watermelons, slippery kabis, rice	Flea beetles, pumpkin beetle, and other insects	TTM sells this to watermelon growers for control of the pumpkin beetle.
Chlorpyrifos	Many crops and household uses	Many pests	Broad spectrum used for both indoor and outdoor pest control.
ICON	Household pests, especially mosquitoes	Mosquitoes control in public health programme	Some farmers use this also on crops for pest control.
Karate	Slippery kabis, cabbages, watermelons, beans	Bollworms, aphids, plant bugs, thrips, beetles, <i>Spodoptera spp.</i>	Broad spectrum synthetic pyrethroid for control of wide range of crop pests.
Lambda 2.5%EC	Same as for Karate	Same as for Karate	Same as for Karate
Malathion	Crops and domestic use	Crop and domestic pests	Old insecticide; many crops pests are resistant to Malathion.
Mavrik	Slippery kabis, beans, cabbages	Aphids, caterpillars, beetles, etc.	Mostly used for chewing and sucking insects
Mustang	Taro	Taro beetles	One of the registered insecticides for use for TB control in PNG
Orthene/Otin	Rice, vegetables and many other crops	Brown plant hopper, rice leaf roller, diamondback moth, bollworm, aphids, leaf miners and many other pests.	Most common insecticide in use in SI; given by TTM to rice farmers for rice pest control.
Perkill 250 EC	Many crops and household	Crops pests and impregnating of mosquito nets for malaria control programme	Mo common SP in use many places.
Pyrethrum	Crops and household pests	Many pests on ornamental and garden crops – aphids, caterpillars, etc	A natural insecticide
Success	Vegetables and fruits	Bollworm, hornworm, fruitworm, armyworm, cluster caterpillar,	A biopesticides certified for use in organic agriculture

		diamondback moth, large cabbage moth, and others	
Target	Vegetables and ornamentals	Bollworm, hornworm, fruitworm, armyworm, cluster caterpillar, diamondback moth, large cabbage moth, and others	Mixture of permethrin and primiphos-mehtyl
<b>Molluscides</b>			
Yates Baysol	Gardens	For control of snails and slugs	Bait which is scattered. In very moist conditions it develops moulds which become un attractive to snails. Avoid domestic animal
Yates Blitzem	Gardens	For control of slugs and snails	Bait pellets scattered in gardens or on periphery of gardens. Avoid development of moulds.
<b>Fungicides</b>			
Axiom	Vegetables, crops, ornamentals	Leaf spots, anthracnose, rusts, scabs, downy mildews, etc	A protectant fungicide for used on crops and seed treatment.
Borrek	„	Leaf moulds, leaf spots, downy mildews, late blights, fruits rots, etc.	Protectant fungicide for use on moulds and many fungal diseases
Leaf curl	Cocoa and other crops	Cocoa black pod and other fungi and bacterial diseases	Registered as Cobox in 1986
<b>Herbicides</b>			
Amine 720	Pastures, playing fields, lawns, cereals	Selective for control of broadleaf weeds	2, 4-D is hormonal herbicide and is commonly used as selective herbicide for control of broadleaves in crops; drifts should be avoided to non target plants.
Glyphosate	Oil palm and general use	Non selective for all weeds; used in zero cultivation	Translocated herbicide; also is used for killing of trees by drilling.
Gramoxone	Oil palm, crops and general weed control	Non selective for all weeds	A general knockdown herbicide; high oral and dermal toxicity; its phasing out in many countries
Grasskill	Same as Glyphosate	Same as Glyphosate	Same as Glyphosate
<b>Timber treatments</b>			
Borracol	Timber	For treatment of processed timber	Insecticide/fungicide mixture for timber treatment
Eco-Bor	Timber	For treatment of processed	Insecticide and fungicide

		timber	mixture used for timber treatment
<b>Others</b>			
Cockroach gel bait	In houses	For control of cockroaches	Placed in places where cockroaches breed or tracks
Rat tracking powder	Farms, building, industrial areas	For tracking and control of rats	Can be mixed with wheat or other materials as baits
Scarecrow bird repellent	Birds	For scaring birds in crops	

### ANNEX 3: LIST OF WHO CLASSIFICATION OF COMMERCIAL FORMULATIONS OF PESTICIDES AVAILABLE IN SI.

Pesticide formulations	Common Names	WHO classification of hazards	Main Use
Abamectin 0.15%EC	Abamectin	U	Insecticide
Bacillus thuringiensis	Bacillus thuringiensis	U	Insecticide
Bayticol Dip	Flumethrin	U	Insecticide for ticks
Carbaryl	Carbaryl	II	Insecticide
Carbofuran	Carbofuran	IB	Insecticide
Cartap	Cartap	II	Insecticide
Chlorpyrifos	Chlorpyrifos	II	Insecticide
Deltamethrin	Deltamethrin	II	Insecticide
Fenitrothion	Fenitrothion	II	Insecticide
Fipronil	Fipronil	II	Insecticide
ICON	Lambda-cyhalothrin	II	Insecticide/ mosquitoes
Karate	Lambda-cyhalothrin	II	Insecticide
Lambda 2.5%EC	Lambda-cyhalothrin	II	Insecticide
Malathion	Malathion	III	Insecticide
Mavrik	Tau-fluvalinate	II	Insecticide
Mustang	Imidacloprid	II	Insecticide for TB
Natrasoap	Potassium salts	UN	Insecticide/Miticide
Orthene/Otin	Acephate	III	Insecticide
Perkill 250 EC	Permethrin	II	Insecticide
Pyrethrum	Pyrethrin	II	Insecticide
Silafluofen	Silafluofen	II	Insecticide
Success	Spinosad	U	Insecticide
Target	Permethrin-pirimiphos-methyl	II	Insecticide
Tebufenozide	Tebufenozide	III	Insecticide
Termidor	Fipronil	II	Insecticide /termites
Yates Baysol	Methiocarb	1B	Molluscide
Yates Blitzem	Metaldehyde	II	Molluscide
Axiom	Mancozeb	U	Fungicide
Borrek	Chlorothalonil	U	Fungicide
Fos-Jet 60	Phosphite	U	Fungicide
Leaf curl	Copper oxychloride	III	Fungicide
Tricyclazole	Tricyclazole	II	Fungicide
Amine 720	2,4.D	III	Herbicide
Butachlor	Butachlor	U	Herbicide
Glyphosate	Glyphosate	U	Herbicide
Gramoxone	Paraquat	II	Herbicide
Grasskill	Glyphosate	U	Herbicide
Boracol	Ethylene glycol +	II	Timber treatment
Eco-Bor	Disodium Octaborate	U	Timber treatment



	Tetrahydrate		
Cockroach gel bait	Boric acid	U	Cockroach bait
Invicta	Abamectin	U	Cockroach bait
Contrac	Bromadiolone	1A	Rat bait
Rat tracking powder	Diphacinone	1A	Rat bait
Talon pillet	Brodifacoum	1A	Rat bait
Scarecrow bird repellent	Polybutene	U	Bird repellent
Quick Bayt	Imidacloprid	II	Fly bait
Mortein	Allethrin, Resmethrin	III	Household pests

- 1A – extremely hazardous
- 1B – highly hazardous
- II – moderately hazardous
- III – slightly hazardous
- U – unclassified (not hazardous in normal use)

## Annex 8 - Minutes of the Stakeholder Consultation on the RDP II, Draft ESMF

A stakeholder consultative workshop was held to obtain feedback on the on the Rural Development Program II (RDP II) Environment and Social Management Framework (ESMF). The consultation was held at the Ministry of Development, Planning and Aid Coordination Conference room from 9:00 – 11:20am on the 12 August 2014. Representatives from 20 Government Ministries and organizations were invited to attend the consultation (list attached) however only 12 people attended (see the participants list attached)

Outlined below is the consultation schedule

Time	Session
09:00	Welcome and Introductions
09:10	RDP II ESMF overview
10:00	Feedback session
11:00	close

RDP presented an overview of the ESMF and its context in the policy and legislative framework of the SI and the WB.

The following points were raised during the feedback session;

1. The use of fire and therefore the use of firewood to dry cocoa and copra and the issue of smoke-effect on quality should be considered for improvement by introducing hybrid driers using solar and other improved technologies where possible.
2. Firewood is getting difficult to source in many communities so the introduction of woodlots of fast growing species should reduce the pressure on both forest harvesting and cocoa and copra drying and home use.
3. The re-use of cocoa fermentation residues in the production of agricultural or non-agricultural by-products should be investigated and considered to reduce any environmental concerns.
4. The pesticides registration committee revamped in MAL must be supported to ensure that pesticide management and enforcement controls are effective especially when commercialization pressures could force farmers to take a short cut without adequate environmental considerations.
5. The use of more integrated farming systems on coastal plains and existing plantations and croplands should be emphasized to reduce pressure for land use on slopes.
6. The potential of elite capture and political influence and the RDP II processes to minimize this was discussed. All efforts and tools to reduce and prevent elite capture should be vigorously implemented.
7. The opportunity for Community Helpers to become mainstreamed community facilitators should be encouraged.
8. The RDP Environment Officer and RDP should maintain strong linkages to the Ministry of Environment during implementation of the ESMF guidelines.
9. Specify the funding envelope size for each component in Chapter 2 of the document.
10. The support to the private sector in Component 2 is a very positive activity and endorsed.
11. Employment creation is a important part of Component 2.
12. The sub component for disaster recovery should be maintained as planned for future disaster events.

13. The issue of Genetically Modified Organisms (GMO) should be monitored to ensure that they are not introduced into the SI. Regulation of GMOs is through the Ministry of Environment, Climate Change, Disaster Management & Meteorology
14. The promotion of commercialization must be monitored in order not to jeopardize the smallholder garden livelihoods dependent on open pollinated crops. Note should be taken of effective smallholder cropping systems like 'king cropping' and should be encouraged to promote smallholder participation in the commercialization of annual and other field crops.
15. The tourism sector fully supports the lokol kaikai objectives and RDP2 should effectively promote these in its Component 2 activities.
16. Tourism relies on the environment so it is essential the activities are assessed for potential adverse affects and this ESMF is needed and will be useful.
17. Shelter is an important consideration in agriculture recovery efforts as it is a primary need for self-actualization of affected communities before they can fully participate in agriculture recovery. It is very important in tree resource poor communities such as in the Guadalcanal plains where vegetation cover is mostly grassland. Recommended encouraging farmers to plant trees species for building materials.

## **Attachments**

### **ESMF Consultation Invitation List**

The relevant Directors/managers from the following Ministries and organizations were invited to participate in the RDP II ESMF consultations.

1. Ministry of Environment, Climate Change, Disaster Management & Meteorology
2. Ministry of Rural Development
3. Ministry of Mines, Energy and Rural Electrification
4. Ministry of Forestry
5. Ministry of Fisheries and Marine
6. Ministry of Infrastructure Development
7. Ministry of Provincial Government and Institutional Strengthening
8. Ministry of Women, Youth and Children Affairs
9. Ministry of Tourism and Cultural Affaires
10. Ministry of Planning & Aid Coordination
11. Ministry of Finance & Treasury
12. Ministry of Commerce, Industries Labour and Immigration
13. Ministry of Health & Medical Services
14. Ministry of Forest
15. Kastom Garden Association
16. World Vision Solomon Islands
17. Save the Children
18. Solomon Islands Chamber of Commerce
19. Development Services Exchange
20. Solomon Islands Development Trust

**List of participants at the RDP II ESMF consultations**

	Names	Organization	Position
1	Rachel Sibisopose	Ministry of Tourism and Culture	Principal Tourism Officer
2	Rose T Kitua	Ministry of Development, Planning and Aid Coordination	HOV (NAOSO)
3	Gabriel Hiele	Rural Development Program /Ministry of Agriculture and Livestock	C2 Coordinator
4	Moses Pelomo	Kastom Gaden	Chairman
5	Susan Sulu-Dhari	Ministry of Development, Planning and Aid Coordination	Director
6	Daniel Rove	Ministry of Development, Planning and Aid Coordination	Director, Soc Sec
7	Lottie Vaisekavea	Rural Development Program	Program Manager
8	Anthony Saomatangi	Rural Development Program	C1 Coordinator
9	Mark Johnston	Rural Development Program	Implementation Advisor
10	Clement Hadosaia	Kastom Gaden	Manager
11	Jimmy Nuake	Ministry of Infrastructure Development	Undersecretary Technical
12	William Okekini	Ministry of Rural Development	Director, PP