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Solomon Islands Agriculture and Rural Transformation Project (P173043)

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

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Executive Summary

The project's overall Environmental and Social Risk Classification is 'Substantial' due to (i) MAL's limited capacity and track record of relying on external consultants and (ii) nature, characteristics, and typologies of the project are neither complex nor large in scale. The project does not involve investment that has a high potential for harming the environment and society. The Environmental and Social standards (ESSs) 1, 2, 3, 4, 6, 7, and 10 are assessed as relevant. ESSs 5, 8, and 9 are not currently relevant, given the Project's current context and timing. Ongoing monitoring during Project implementation will continue to assess the relevance of the ESSs throughout implementation.

The project will have a sizeable capacity-building focus working with smallholder farmers through improved agriculture extension and advisory services which will lead to higher productivity and production, including equitable women representation. The project will provide capacity building and technical assistance, and as such the World Bank's Guidance for Technical Assistance and the Environmental and Social Framework (2019) will be applied. Accordingly, the environmental and social principles will be integrated into the Terms of References for the capacity building and technical assistance activities to enhance the positive environmental and social benefits. Furthermore, extension services and training to farmers will include COVID-19 safety, safe use and handling of all agrochemicals: pesticides, chemical fertilizers and soil amendments, agricultural discharge to surface water through runoff of pesticides. The agendas of training of trainers (TOT) for producer organization would integrate the environmental, safety and health (EHS) requirements. For instance, the project will mostly benefit the population through training and capacity development of the staff in MAL (particularly the Agriculture Extension Officers and Livestock Officers). The project will develop training modules for producer organisations (PO); provide training for farmers, especially women; and facilitate private sector and NGOs link to POs and use new technology for outreach activities.

According to the project typologies, the potentially adverse environmental and social risks can be grouped into (i) impacts of agricultural and smallstock production and processing and (ii) impacts of small infrastructures such as offices, storage assets, housing management assets, and productive infrastructures related to the agriculture commodity and smallstock-specific value chains. While the project impacts will be further screened during the project implementation, potential environmental and social impacts associated with the project activities are expected to be site-specific, localised, and readily-managed through the implementation of Environmental Code of Practices (ECOPs) for the known-industry impacts in the agriculture and livestock sector. There are some risks related to the management of the usage of pesticides and the operations of pig breeding facilities and/or small slaughter slabs for smallstock (i.e. poultry and pigs), which could lead to environmental, hygiene, health, and safety issues resulting from the waste products and wastewater. While MAL has committed to applying the slaughtering hygiene, health, and safety standards required under the FAO guidelines, site-specific ESMPs might be required subject to results of the environmental and social impact screening during implementation. Another concern is the travel to remote areas associated with the implementation of the project activities, including island crossings, will expose the project workers to considerable health and safety risks. MAL commits with advisory and budget support to ensure safe travel procedures can be developed, resourced and implemented for the project staff.

MAL has gained exposure in operationalizing the World Bank Safeguards Policies through RDP and RDP II experience. The project can present additional challenges, including adjusting to the new requirements of the ESF approach. The Lessons learned—detailed in the ESMF—from implementing the safeguards instruments under the Solomon Islands RDP,RDPII and CAUSE projects include (i) enhanced monitoring

and reporting of environmental and social issues should be ensured as part of the project operation and (ii) consistent and persistent efforts of MAL's environmental and social focal points, a full-time Environmental Risk Management Consultant and a full-time Social Risk Management Consultant will also be recruited to the PMU. If two full-time local Environmental and Social Risk Management Consultants are not able to be recruited, one full time local Environmental and Social Consultant and one international part-time Environmental and Social Consultant may be recruited instead. The World Bank team is to continue providing hands-on support to MAL's environmental and social focal points, the communities and the province-based staff to ensure issues related to the environmental and social risk management are continuously monitored and followed up on. The transition to the environmental and social framework (ESF) requirements will require that project staff at all levels including provincial MAL, community, contractors and suppliers, develop a broad understanding of the ESF approach such as the concept of proportionality and adaptive management of risks. A budget of over US$ 915,475 is allocated in the ESMF to address environmental and social Risk Management requirements.

1 Introduction

- Agriculture of the Solomon Islands (SI) is the most crucial sector for the Solomon Islands' national economy. It provides for and sustains 85 per cent of the rural population with food crops, cash crops, and livestock for their daily livelihoods, food, and social security. Agriculture holdings account for 40 per cent of the landmass of the country. The agriculture sector continues to face many challenges, including the limited availability of suitable agriculture land, the depletion of soil fertility due to intensive land use for logging and mining, the impact of climate change, high internal transport costs, rudimentary or missing infrastructure in terms of warehouses, processing facilities, roads, and jetties, insufficient or insecure land tenure for small landholders, and limited access to finance and other agricultural support services.

- The country has rich ecosystems and biodiversity. Her environment is threatened by unsustainable logging practices, leading to habitat destruction and potential for increased soil erosion, landslides and flooding. High rates of population growth and underemployment lead to pressure to develop an income from cash crops, hence further habitat destruction. Extreme weather events are likely to increase in frequency and severity under the influence of climate change, along with pressure for people to move to higher ground for agricultural and livestock activities.

- The Solomon Islands National Development Strategy (NDS) (2016 – 2035) highlights the importance of agriculture in contributing to both Objective One (sustained and inclusive economic growth), as well Objective Two (poverty alleviated across the whole of the Solomon Islands, basic needs addressed and food security improved; benefits of development more equitably distributed). To support these objectives, the Government of Solomon Islands has requested World Bank support through a USD15 million investment project. The proposed ART project will contribute to both NDS objectives through a dual focus on food security with subsistence farmers, and increased commercialization and export potential through agri-businesses and producer organizations. The proposed project will also support and is fully aligned to, the priorities of the Solomon Islands Agriculture Sector Growth and Investment Plan (2021 – 2030).

- The Agriculture and Rural Transformation (ART) project is prepared upon the request from the Solomon Island Government (SIG) through Ministry of Agriculture and Lands (MAL) just before the onset of the global pandemic of COVID-19. Its design and preparation have, therefore been affected and influenced by the pandemic taking a stronger focus on agricultural production and agriculture commercialization while also promoting productivity for stronger exports.

2 Purpose and Scope of ESMF

- The purpose of the Environmental and Social Management Framework (ESMF) is to ensure that the project activities are screened for any negative social and environmental impacts and mitigating measures are taken into account in activity design and implementation. In other words, the ESMF is developed to ensure the project investments do not create or result in significant adverse impacts on local livelihoods and the environment. That potential impacts are identified, avoided or at least minimized. To comply with the WB's Environmental and Social Standards (ESSs) of the Environmental and Social Framework (ESF), preparation and disclosure of an Environment and Social Management Framework (ESMF) for the Project before the appraisal is required. This is to ensure that the proposed Project has a concrete plan and process in place to avoid, minimize, and/or mitigate the risks and potential adverse environmental and social (E&S) impacts of the Project when the activities and/or subprojects are identified, planned, and implemented.

- In general, the ESMF examines the risks and impacts and sets out the principles, rules, guidelines, and procedures to assess the potential risks and impacts of sub-project and activities including technical assistance (TA). It provides measures and plans to reduce, mitigate, and/or offset adverse risks and impacts. Besides, it provides adequate information on sub-projects' expected location (including any potential E&S vulnerabilities of the area) and on the potential impacts that may occur and mitigation measures that might be expected to be used. Specific objectives of this ESMF are to:

    - assess the potential environmental and social risks and impacts of the proposed Project, whether positive or negative and propose mitigation measures which will effectively address these risks and impacts;
    - establish clear procedures for the E&S planning, review, approval, and implementation of subprojects, TA, and other activities to be financed under the Project;
    - specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring E&S issues/ concerns related to subprojects, TA, and activities;
    - determine the training, capacity building and technical assistance needed to implement the provisions of the ESMF successfully;
    - address mechanisms for public consultation and disclosure of project documents as well as redress of possible grievances; and
    - establish the budget requirement for the implementation of the ESMF.

- The ESMF also follows the requirements of the World Bank ESF, Guidance Note for Borrowers on the Application of the ESSs, and the Guidance for Environmental and Social Safeguard Instruments for the Pacific and Island Countries (2015). The ESMF inherits lessons learned from the implementation of Rural Development Program (RDP) II.

3 Project Description

- Preparation of the SI ART was initiated at the request of the Solomon Islands Government (SIG) through MAL just before the onset of the global COVID-19 pandemic. In view of the adverse impacts caused by COVID-19 in the country, its design has been retrofitted to help addressing both short and medium term COVID-19 response and recovery needs for economic growth by strengthening the capacity of households and communities for increased agricultural production, while also promoting sustainable production growth and commercialization over the medium to longer term to meet growing domestic and export demand. Achieving the Project Development Objective (PDO), as stated above, will also contribute to (a) the SIG's stimulus package in response to the COVID-19 pandemic and the country's recovery phase; (b) import substitution and increase in the supply and consumption of domestically produced food, smallstock feed and meat products; (c) boosting exports of selected commodities; and (d) strengthening resilience of smallholder and semicommercial farming households to climate change and climate-induced disasters (cyclones, heavy rains, prolonged dry seasons, flood, landslides, pests).

3.1 Project Components

The project has four components:

(a) Component 1: Agribusiness and Infrastructure Investments (US$11.2million)

(b) Component 2: Institutional Capacity Development (US$1.8million)

(c) Component 3: Project Management (US$2.0 million)

(d) Component 4: Contingent Emergency Response Component (US$0 million).

26. Component 1: Agribusiness and Infrastructure Investments (US$11.2million). This component aims to: (a) increase agricultural production and promote agriculture commercialization in selected value chains, and (b) develop productive infrastructure to facilitate the economic activities under (a). This Component is structured into two sub-components of (1) Agribusiness Producer Organizations which involves organizing smallholder farmers at the semicommercial production level into groups around a common commodity/value chain, improving their production capacity, productivity and improving their links to markets; and (2) Infrastructure Investments which address directly MAL's infrastructure investment needs to improve its service capacity as well as facilitate value chain developments.

27. Subcomponent 1.1: Agribusiness Producer Organizations (ABPOs) (US$5.8million). The project will support: (a) the registration of existing ABPOs, (b) the formation and registration of new ABPOs, (c) development of ABPOs' Business Plans ('Business Plans'), and (d) provision of grants to ABPOs to execute activities proposed under their Business Plans. ABPOs will be involved in cash crops such as coconut, cocoa, honey, and smallstock production, given that these are well-known value chains for exports (cocoa and coconut) or serve domestic markets (honey, poultry, and pigs). However, the subcomponent is also open to support the cultivation of new cash crops, food crops, and feed crops which are fetching a higher price for farmers and are established in the market. These could be grown in the field and also in home nutrition gardens as relevant. Under this subcomponent, the grant to ABPOs would finance activities under the ABPO's Business Plans, including: (a) training of ABPO members; (b) supporting the training of Community Resource Persons (CRPs) and para-veterinarians (or commonly known, and subsequently referred to, as paravet) (c) honorarium for CRPs and paravets; (d) production of cash crop, food crops, and feed crops, including climate-smart production and productivity enhancement; (e) semicommercial smallstock raising; (f) nurseries and seed banks; (g) purchase and installation of value chain assets; (h) machine hiring center (including repair and maintenance); (i) improvement of sheds, fencing, and other housing infrastructure for smallstock raising; (j) disease control; (k) digital tablet devices; (l) books of records; and (m) other expenditures related to the operations of ABPOs. A separate Grant Manual will be developed by the project to guide ABPOs for grant management. Adoption of a satisfactory Grant Manual is a disbursement condition for the ABPO Grants. Trainings provided at the community level will incorporate lessons such as: (a) holding them at times when women and men can attend; (b) providing childcare, if needed; and (c) including breaks to allow mothers to breastfeed or parents to tend to children.

28. With these supports, ABPOs are expected to benefit from: (a) improved agriculture extension on climate smart agriculture (CSA), (b) increased awareness from market intelligence, and (c) creation of value chain assets for local-level value addition and processing. Technical assistance on CSA such as inter-cropping, multiple cropping, feed crop production and processing, flowers as boundary crops to dissuade insects, low external input sustainable agriculture, use of high-quality seed varieties and seed treatment, use of plant and animal extracts to control insect-pest, and white/yellow sticky trap, will be provided to farmers through CRPs. Regular weather information will be disseminated among ABPO members to take precautionary measures to develop climate resilience.

29. The ABPO Business Plan must include contributions from the ABPO comprising, in monetary terms, at least 10 percent of the total business plan budget. The grant will cover the remaining 90 percent and the estimated amount to an ABPO with 50 members is approximately US$58,000 . Eligible expenditures include purchasing value chain assets (equipment and machinery, tools, and implements); working capital; capacity building; books of register; tablets; training of CRPs and paravets; payment for CRPs and paravets; storage sheds; and operating costs. Working capital will be a revolving fund included in the Business Plan budget, which can be used as gap financing for ABPO members to borrow for relevant purchases and which would be repaid from payments received by the ABPO from buyers. Training and capacity building on postproduction, value addition, and installation of equipment and machinery will be

paid by ABPOs to agribusiness partners/companies as relevant. Value chains such as honey, where women traditionally play a larger role, as well as equipment which has been shown to increase female involvement in commercial activities, such as solar dryers for cocoa, will be encouraged. Priority will be given to the purchase of equipment that ensure a sustainable and climate-smart value chain. This will include the building of facilities such as storage facilities using climate sturdy equipment that is resilient to climate extremes and that minimizes emissions. Priority will be given to energy-efficient equipment and the application of renewable energy where possible.

30. The same process will be applied to smallstock ABPOs. Support will be provided to improve housing, husbandry tools, fencing, feed crop production with an emphasis on cassava production to counter the increasing cost of other available feedstuffs, small to medium-scale feed crop processing and milling, and other inputs along the smallstock production chain. Investments may include the construction or upgrading of pig and poultry sheds and night shelters; poultry nesting boxes to improve egg hatching rates and reduce chick mortality; small-capacity, solar-powered egg incubators to produce day-old chicks; pig farrowing crates to reduce piglet mortality; seeds, feed crop planting materials, mini-feed mills, and equipment for the production and processing of feed crops; and small-scale insect protein poultry feed production equipment. ABPOs organized by youth and women's groups involved in smallstock production will also be encouraged. All structures and installations across the smallstock production chain will be optimized for energy efficiency and renewable energy such as solar power. Breeding pigs will be supplied by pig multiplier farms which will be supported by the project to upgrade their stock and farm housing.

31. Several activities will be applied to both types of ABPOs such as digital intervention, finance management and statutory obligations, and management of value chain assets. Digital intervention includes the introduction of tablets and smartphones to capture field data in a connect online-connect offline (COCO) system; support for geotagging of agriculture landholding of farmers and sheds of smallstock farmers; and regular dissemination of weather, market, and shipping information. Digital extension services will include short video shows on new climate-smart technologies, improved agricultural practices, value addition and processing, animal health services for smallstock, housing and feed management of chickens and pigs, and so on. The tablet will be part of the ABPO investment fund package. Digital extension services are likely to reduce the carbon footprint of extension services, while ensuring more timely delivery of climate information and preparedness of farmers, thereby building their resilience to climate hazards, such as cyclones and drought.

32. Financial management and statutory obligations would involve developing and distributing standardized books of registers for recording regular transactions in ABPOs. Training and demonstration programs on bookkeeping and finance management will be provided by MAL. Province MAL staff will facilitate the opening of bank accounts, ABPO registration, obtaining of a business license, audits, and other statutory obligations. Agriculture is often considered a 'risky' business due to uncertain cash flows and production, particularly in the face of climate change. To 'de-risk' farmers moving into more commercial activities, the project will promote adoption of innovations in climate-smart technologies and tools which, it is anticipated, will provide more stable returns to the farmers and ABPOs. Regular weather information, timely harvesting, value addition such as processing, grading, moisture measurement, packing, and efficient storage will assist in maintaining the quality of produce and will reduce the postharvest waste and losses substantially. The project funds, with expected finance for ABPOs from banks and microfinance institutions, will also reduce private sector investment risk by subsidizing new technologies, while allowing market pull through ABPOs determining more appropriate investments.

33. Climate-smart production and extension services would involve sharing of regular weather information, modification of cropping schedule, intercropping, and transplanting of seedlings in the north-south direction. It will also promote integrated disease and pest management (IDPM) practices, integrated nutrient management practices, regenerative agriculture, and different seed varieties, low heat intensity smallstock housing designs which can withstand climatic hazards such as flood and drought.

34. Management, repair, and maintenance of value chain assets. ABPOs will select one or two youth(s) from member households to be trained to undertake the repair and maintenance activities. MAL will provide skill development training and demonstration, and these trained youth will be able to provide repair and maintenance services on a fee-for-service basis to both ABPO and non-ABPO member households. Expenditures on repair and maintenance of major equipment and machinery will be borne by the ABPO. The training cost of the youth will be part of the Community Managed Extension System (Subcomponent 2.1).

35. Subcomponent 1.2: Infrastructure Investments (US$5.4 million). Productive infrastructure under the SI ART will focus on targeted investments which provide the foundation for economic and production activity and generate positive spillover benefits. Investments will directly enhance MAL's service and research capacity, MAL's provincial offices and facilitate market access in Makira Province. The project will finance the site clearing, design and construction of a training center and a research center in Tenaru, Guadalcanal; rehabilitation of MAL's national research headquarters; site clearing, design and construction of MAL's new Pig Breed Improvement Facility in Tenaru, Guadalcanal; site clearing, design and construction of a market in Makira and a storage facility in Kira-Kira, Makira; and site clearing and demolition, design and construction of MAL's provincial offices in Makira and Malaita Provinces. The expected number of direct beneficiaries for these proposed investments is around 60,000 people throughout the project's lifespan. MAL will be the direct investment owner and operator for these investments, except for the market and storage facilities in Makira which are owned by the Makira Provincial Authority, and MAL will work closely with the authority to manage those investments. It is expected that the large investment to build the Pig Breed Improvement Facility in Tenaru will increase the supply of pig breeding stock to semi-and fully commercial pig farmers. The new farm will have an 80-sow herd, which will provide sufficient offspring to supply existing commercial and semi-commercial farms, and multiplier farms, with breeding boars and sows. The breeding stock from the Honiara pig breeding farm will be transferred to the new Tenaru farm. To counter the increasing costs of imported and locally available feedstuffs, and to support the addition of pig multiplier farms, support will be provided to grow and process cassava as an important source of pig feed. Other infrastructure investments to MAL facilities are expected to boost MAL's enabling services and its research capacity in feed crop production for national coverage, beyond the three project provinces.

36. No construction outside of the 5 lists sites (Tenaru, Guadalcanal; MAL's national research headquarters; new Pig Breed Improvement Facility in Tenaru, Guadalcanal; market in Makira and a storage facility in Kira-Kira, Makira; and MAL's provincial offices in Makira and Malaita Provinces). Locations for MAL facilities have all been identified as having secured land lease or are MAL-owned land with regard to upgrading of existing infrastructure. For the market and storage facilities in Makira, MAL and Makira Provincial Authority will conduct due diligence consultations to participatorily identify relevant locations that would best serve the needs of local people and businesses to facilitate the value chains and economic activities of the province. MAL has developed some design layouts and sample designs for MAL provincial offices are currently available to expedite the preparation process. A selected MAL training center and a selected MAL research center, to be financed under the SI ART, will strengthen the training division of the ministry to organize continuous training programs which will build the capacities of extension service providers and farmers to improve the performance of the agriculture and smallstock subsector. The project will include climate-resilient designs such as flood risk management and the promotion of energy efficiency/renewable energy in the infrastructure investment decisions. The project will also reconstruct and/or adopt improved engineering designs using international best practices to enhance their climate resilience.

37. Component 2: Institutional Capacity Development (US$1.8 million). This component aims to improve the agriculture and smallstock extension system of MAL by improving the knowledge, skills, and capacity of current staff and to strengthen MAL's outreach capacity through the engagement of young

professionals (YPs) and interns. It will also support renewal of the smallstock sector and train additional paravets to provide smallstock farm biosecurity and provide basic animal health services. Development Market Place events will be organized to show case and give awards to high-quality produce or commodities and best practices or innovations for establishing market links and scaling up.

38. Subcomponent 2.1: Community Managed Extension System (US$1.0 million). This subcomponent will focus on five areas outlined below. Training of MAL staff, YPs, and CRPs will be prioritized at the start of the project to ensure proper technical assistance is ready and available before rolling out support to ABPOs under Component 1. Extension services are one of the leading ways to ensure the adoption of CSA practices. This activity will ensure that CSA is mainstreamed in all training of MAL staff, YPs, and CRPs, and the extension services they offer through CSA training modules use of information technology to distribute climate information through digital extension by organizing video shows at the doorstep of farmers.

(a) Training of trainers (ToTs) will use modular training to develop new knowledge and enhance the skills of extension staff in MAL. Where necessary, an outside institution will be contracted by MAL to develop training modules and organize the ToTs. These training modules may include formation, nurturing, and strengthening of ABPOs; bookkeeping and financial management (FM) of ABPOs; GAPs and productivity enhancement methods/practices of commodities, such as climate-smart practices.

(b) CRP (and paravet) training will be done by MAL extension staff at the province level, with technical support from Solomon Islands National University (SINU) or any other training service providers when needed. Trainings will be developed in local languages and include demonstrations, simulations, and video shows in the project provinces. Extension staff will develop and provide the training aids to each participant, with audiovisuals loaded on their tablets. After each training, extension staff will develop an action plan for CRPs and organize demonstrations in the villages.

(c) CRPs will provide one-day training programs to ABPO members or their families. CRPs will visit the agriculture fields and smallstock farms of ABPO members to provide doorstep extension services and will also capture project progress in the digital management information system (MIS). A detailed guideline on selection, training, tasks, outputs, and incentive payment of CRPs will be developed by the project.

(d) Degree/diploma graduates of the Faculty of Agriculture, Forestry, and Fisheries (FAFF) of SINU and/or from other recognized agriculture universities in the Pacific countries will be recruited as YPs on a contract basis (as project consultants) and placed where there is an absence of extension officers in the catchment area of the ABPO. YPs will be responsible for providing support activities around the development and rollout out of ABPO Business Plans, technical assistance, marketing, monitoring, as well as providing general agriculture extension. Graduates will stay in villages of ABPOs while on the job and the project will aim for 50 percent of YPs to be women which will be possible based on current levels of female enrollment in FAFF.

(e) Students pursuing diplomas/degrees will be inducted as interns from FAFF (SINU) during their scheduled internship program. Based on the project requirements, best suited students will be selected as interns who will be supported with relevant training and small stipends to conduct their internships in the project areas. The project will also facilitate FAFF to include the students' learning on CSA from the internship to be discussed in the classroom and include in the course curriculum as relevant. The internship program will be financed by the project through a memorandum of understanding (MOU) to be signed between MAL and FAFF, SINU. Such financing on training and stipends for the selected interns will be up to the project's closing date. MAL and SINU may wish to use their own funding to continue with the internship program as relevant.

39. Subcomponent 2.2: Smallstock Sector Renewal (US$0.55 million). This subcomponent will support the MAL Division of Livestock to enlarge its Pig Breed Improvement Program by increasing and upgrading pig multiplier farms through the provision of training and equipment in the project provinces as well as

upgrading of household-based and semicommercial poultry production; provide small-scale slaughter facilities for pigs and poultry; support feed crop research; and improve animal health service support. It is expected that these interventions will lead to improved production and productivity, reduced mortality, increased consumption of animal protein, increased body weight, and increased sales of pig and chicken meat in domestic markets. The activities under this subcomponent are as follows:

(a) Smallstock slaughter infrastructure. Pig and poultry slaughter slabs will be established at the ABPO level in strategic locations with high smallstock concentrations (most likely near Honiara and Auki). Expressions of Interest (EoIs) to build, own, and operate the slaughter slabs will be sought from the private sector (agribusiness companies and registered ABPOs). Project support to the selected private sector entity will be in the form of a Sub-grant in an amount up to US$15,000 or 49 percent of the total estimated costs for each slab, whichever is the smallest. The Project Implementation Manual (PIM) will set forth a template Sub-grant Agreement and detailed eligibility and other criteria, procedures, and requirements for carrying out the Sub-grants. The Sub-grant can only be implemented once a satisfactory PIM is adopted, and a satisfactory Sub-grant Agreement is signed with the Private Sector Entity receiving the Sub-grant. The waste management system, which is an integral part of the slaughter slabs, will be designed to treat liquid and solid waste, the latter by means of biogas production where possible. The project will support the training of four meat inspectors from MAL to attend a three-month training course in Australia. Upon successful completion, they would receive an international slaughter certificate, which, together with slab design and slaughter operations, opens the way to best practice Hazard Analysis and Critical Control Points (HACCP) hygienic slaughter accreditation.

(b) Adaptive research in feed crops. New high-protein climate-resilient feed crops such as pulses, beans, winged bean, cassava, and cowpea as well as small-scale insect protein feed production for households producing poultry will be introduced. Field trials on new high-protein feed crops will be conducted on participating households and lead farmer plots to ensure that the applied research conducted will be adapted to field conditions. Training and demonstrations will be organized for the CRPs who will in turn train ABPO members, and MAL extension staff will provide technical advisory support.

(c) Animal health support services. The project will finance the supply of veterinary drugs to the MAL central veterinary laboratory and one veterinary laboratory in each of the three project provinces, and the purchase and supply of toolkits to selected paravets, to support basic disease control and animal health services. In the absence of graduate veterinarians, paravets will have to take over significant parts of the animal health duties normally carried out by veterinarians. Additional paravets will be trained by using the internet paravet training course provided by the South Pacific Community and will be equipped with field kits of basic diagnostic tools. The CRPs, with support from paravets, will be trained to provide simple diagnostic and treatment procedures, such as hygiene, farm biosecurity, parasite counts, castration, injections, and vaccinations. The project will support a veterinary consultant to assist MAL to conduct a national livestock disease survey, which has not been updated since 1997. The survey will contribute to the Government's intention to gain membership into the World Organization for Animal Health (OIE).

(d) Pig Breed Improvement Program. The project will finance relevant technical support for the Pig Breed Improvement Program which will be based at a new Pig Breed Improvement Facility at Tenaru, Guadalcanal (to be designed and constructed under Subcomponent 1.2 to replace the existing farm in Ranadi, Honiara). The program will be developed gradually, starting with 30 sows transferred from the existing pig breeding farm near Honiara and eventually reaching 80 sows. The project will provide training and relevant equipment intended to enhance the operation of selected pig farms and pig multiplier farms. Offspring from these sows will be sold as replacement or expansion stock to existing multiplier farmers, who are willing to sell stock to commercial pig farmers. The Tenaru farm will use cassava as a main feed ingredient and purchase the raw product from surrounding farmers and farmer ABPOs.

40. Subcomponent 2.3. Innovations and Development Market Place (US$0.25 million). This

subcomponent will focus on promoting and supporting the exchange of ideas as well as innovations/best practices, which are successfully implemented or demonstrated among youths, ABPOs, entrepreneurs, buyers, policy makers, and investors.

41. This subcomponent has two parts: (a) Annual Innovation Competition and (b) Development Market Place. Under the Annual Innovation Competition, the project will invite submissions of innovations from individuals, ABPOs, and entrepreneurs on an annual basis. MAL and the Project Management Unit (PMU) will set up a committee with members from MAL and relevant agencies to assess the submissions. It is expected that five innovations per year will be selected and awarded with a certificate and a prize (in the form of farm tools or farm equipment with small value of up to SBD10,000 (approximately US$1,200) in an event to celebrate and recognize the winners and their innovations. The awards will be strong incentives for more innovations, especially among rural youths to boost their interest in agriculture and rural enterprise. This has been proved successful under RDPII. Winners may be invited to work with existing ABPOs/develop a new ABPO or to associate with the project as resource person to work, guide, and scale up innovations among the ABPOs in the project provinces.

42. A physical Development Market Place event will be organized in Year 3 of the project to further facilitate the exchange of innovations and interactions among ABPOs, buyers, traders, and so on, for replication and scaling up of innovations. This will be organized by the PMU with support of an outside expert agency to select innovations in a transparent manner, for showcasing and wider adoption. Selected best practice innovations can be scaled up among ABPOs as relevant. Apart from this, the best quality products from selected commodities/value chains will also be chosen for establishing market links with national and international buyers. The selected innovations will be showcased, celebrated, and awarded with a certificate and a prize (in the form of farm tools or equipment with small value of up to SBD10,000 (approximately US$1,200) in the Development Market Place event to encourage continuous innovations. The innovations will be invited, short-listed, and evaluated based on predetermined indicators such as innovativeness, applicability, sustainability, outreach, and ability to scaleup. Innovations that promote climate-smart approaches in the production of commodity value chains will be prioritized. Selected innovations will also be screened for climate relevance as part of the selection criteria.

43. Component 3: Project Management (US$2 million). This component will establish the PMU within MAL which will be responsible for the overall implementation of the SI ART Project. Key positions will include a project manager as well as FM, procurement, M&E, environmental safeguards, social safeguards, and communications specialists. Additional support and technical positions will be brought in, as needed. The PMU will be responsible for the day-to-day project activities, compliance with provisions of the Financing Agreement and SIG policies and guidelines, project administration, preparation of grant withdrawal applications, and maintenance of records. Key activities will be the MIS development as well as baseline and end line impact assessment surveys and the preparation and implementation of a communications strategy, a grievance redress mechanism (GRM), and training and workshops to upskill other MAL staff. Under this component, the project will aim for at least half of the participants in workshops, training events, seminars, and conferences to be women.

44. Component 4: Contingent Emergency Response Component (CERC) (US$0 million). Following an eligible crisis or emergency, the recipient may request the World Bank to reallocate project funds to support emergency response and reconstruction. This component would draw upon the uncommitted credit/grant resources from other project components to cover the emergency response. A ‘CERC Project Implementation Manual’ (CERCPIM), acceptable to the World Bank, will be prepared by MAL for the implementation of the CERC by the recipient’s Ministry of Finance and Treasury (MOFT) and constitute a disbursement condition for this component. Should the CERC be triggered, MOFT will be the implementing agency of the CERC.

3.2 Anticipated Project Typologies

- The project typologies can be clustered as (i) Productive Infrastructure and small physical infrastructures such as provincial offices, field experiments; (ii) agricultural and smallstock[1] improvement including agronomic practices, processing, smallstock breeding, and husbandry practices; and (iii) technical assistance and capacity building for Business Planning, agribusiness partnership, and product branding. The typologies that the project provides under Components 1, 2, and 3 can be characterized in Table 3.1.

Table 3.1: Project Typologies

Typology	Activity
(i) Construct, upgrade or rehabilitate the productive Infrastructure and small infrastructure[2]	**For Agriculture:** • Plant nurseries, Fermentries, dryers, oil mills, processing facilities and their ancillary or associated facilities such as sheds for storage • Mini feed mills to process harvested feed crops: 1 - 2 tons capacity per day • Renovating or establishing existing or new Field Experimentation Stations **For Smallstock (poultry and pig):** • Construction or upgrading of national research headquarters, pig multiplier centre or facility, pig breeding farm or facility, pig and poultry sheds and night shelter; poultry nest-boxes for hens to lay eggs and hatch chicks; small-scale poultry hatcheries; pig farrowing crates to reduce piglet mortality; • Construction of slaughter slabs[3] to be located in strategic pig production areas to facilitate the hygienic off-the-ground slaughter **For Agriculture and Smallstock:** • Existing/new provincial offices, training centres, storage assets or facilities, housing management assets, and around the agriculture commodity and smallstock-specific value chains. • Provision of mobility assets (Vehicle, Boat, etc.) All vehicles and particularly boats will need to comply with safety standard and be accompanied by safety equipment and training according to the national requirements. • Feeder road or footpath within the existing footprints to avoid land acquisition and related resettlement impacts.  
(ii) invest in agricultural and smallstock	**For Agriculture:**

[1] Refers to poultry and pig.

[2] This typology includes all activities related to construction and rehabilitation for the listed activity types including but not limited to design, construction, any required land clearing and demolition.

[3] *The initial proposal is for 1 pig slaughter slab and 1 poultry slab in each of the three project provinces. The estimated investment cost per slab is USD25,000 to USD30,000. The slabs would have a capacity of up to 20 pigs per day (5,000 pigs/year, based on 250 working days per year). Site-specific ESMP/limited ESIA might be prerequired subject to confirmation via the environmental and social screening report.*

production, farming, and product processing	• Seeds, planting materials and cultivation and harvesting tools, processing equipment, honey extractors • Production of feed crops, insect-protein feed production equipment • Increased use of agro-industrial byproducts **For smallstock:** • Chicken and pig feeds will be formulated by piloting feed producing units using locally available materials • Crossbreeding sows or pig breeding for semi-commercial farms to improve weight gain • Improved feeds, using cassava and other available feedstuffs • Feed crop production (cassava, high-protein beans)  
(ii) Technical assistance and capacity building under all components	• Formation, Nurturing, and Strengthening of New Producers Organizations (POs) and Business Plan Development for POs • Agricultural Production and Agribusiness Grants to nurture and strengthen Producer Organizations (POs) • Capacity Building and Extension service training during pre-production, production, post-harvest, processing, value addition, transportation, and marketing • Working Capital cost for Productive infrastructure/tools/equipment • Repair and maintenance of machinery such as Coconut oil mill, cocoa drier, etc. will be borne by the Producer Organization • Training of Trainers (ToTs) for MAL, Training of Community Resource Persons (CRPsCRPs), Training of participating farmers or PO members. CRPsCRPs will provide extension services at the doorstep of farmers • Hiring of Young Professionals from SNRAS, SINU to fill vacant positions in MAL • Internship of diploma and degree students of SNRAS, SINU for project requirement • Veterinary and husbandry support services and Good Smallstock Management Practice to POs • Support POs with basic protocols, standard operating procedures, and business plan; and to farmers through AEOs, CRPsCRPs and agri-business partners.

3.3 Project Beneficiaries

- The Project beneficiaries are the total population of 424,875 people, with 383,916 people (90.4 per cent) with agricultural holdings in the 3 project provinces: Guadalcanal (including the capital city of Honiara), Makira and Malaita with 123,616 population, directly involved in farming and smallstock activities as their primary incomes. However, specific locations are yet predetermined during the project preparation.

- The Project beneficiaries will include members of producer organizations who involved with smallholders, and semi-commercial farmers and their activities that receive grants from the project. They are mostly small-holder farmers/producers who are engaged in (i) agricultural production; (ii) semi-commercial cocoa and coconut production/processing; (iii) honey and other niche local commodities; (iv) semi-commercial pig and poultry producers; (v) women's poultry

producer groups; (vi) consumers receiving hygienically slaughtered pork; (vii) mini-feed mill/feed crop processors; (viii) feed crop production groups and (ix) village pig and poultry producers receiving husbandry training. Project indirect beneficiaries include working as wage employed labors working with processing units, loading and unloading of commodities in ships, and skilled youth in repair and maintenance of productive infrastructure.

- The Project direct beneficiaries also include the Ministry of Agriculture and Livestock (MAL) and its network in the project provinces that are expected to be renewed with additional resources, technical assistance, new technologies and exposure to international best practices. Livestock and extension services are expected to benefit the most from the project investments both in upgraded infrastructures and service/research capacity improvements.

4 Environmental and socio-economic context

- Solomon Islands is a small and fragile island developing state of around 1,000 islands in the south-west Pacific with a population of 650,000 and a total land area of about 28,400 square kilometers. Solomon Islands is among the countries with high levels of institutional and social fragility.

- Solomon Islands is one of the largest countries in Melanesia, and is spread across six large islands, dozens of smaller islands, and hundreds of islets and atolls. More than 80 percent of Solomon Islanders live in rural villages of several hundred people. Its widely dispersed population, along with a narrow economic base, makes the provision of public and infrastructure services challenging. The population is culturally diverse, with 120 indigenous languages spoken throughout the archipelago. Melanesian pidgin is the lingua franca. The social system of the traditional Solomon Islands Melanesian population, with its customary tribal hierarchy, gives meaning to society. These institutions are based on a land tenure system that binds together all persons within the group. In this context, people's relationship to the land is an integral part of their relationship with each other. The tribe system is a larger grouping bound together by descent from the first pioneer to have settled and populated an area of land. The customary communities have a unique inheritance and limited distribution mechanism, with land and resources managed through village and family units.

- The Solomon Islands National Development Strategy (NDS) (2016 - 2035) maps out a strategic direction for the future development of the country, with a national vision of "Improving the Social and Economic Livelihoods of all Solomon Islanders". The NDS highlights agriculture as part of Objective One (sustained and inclusive economic growth), as well Objective Two (poverty alleviated across the whole of the Solomon Islands, basic needs addressed, and food security improved; benefits of development more equitably distributed). The project will contribute to both through a dual focus on agricultural production and commercialization of subsistence farmers, and increased commercialization and export potential through the growth of agri-businesses and POs. Related to these, the proposed project will contribute to the Medium-Term Strategies one and five, through activities aimed at enhancing sustainable subsistence-based farming systems; supporting the policy and regulatory framework for food and smallstock production; encouraging the growth of key subsistence crops as well as cash crops and access to markets; and supporting development along the value chain. The SI ART will also contribute towards the Solomon Islands Nationally Determined Contribution (NDC), which sets a target to reduce emissions by 30% below 2015 levels by 2030, and 45% conditional on international assistance. The NDC also recognizes the growing climate vulnerabilities of the agriculture sector and need for adaptation measures. As shown from the Greenhouse Gas (GHG) EX-ACT analysis,

the project will result in a positive carbon sequestration balance (see Graph 1). The activities here will also contribute to the World Bank's Climate Change Action Plan (2021-2025). The Solomon Islands Agriculture Sector Growth and Investment Plan (ASGIP) for 2021 - 2030 (pending approval) presents MAL's vision of "A sustainable, competitive and profitable agricultural sector enhancing economic growth, food sovereignty and prosperity for all Solomon Islanders". The expected outcomes for the ASGIP are: (a) MAL operates as a professional, client-oriented, effective and accountable institution offering equal opportunities to women and men; (b) Enhanced food and nutrition security for all rural as well as urban areas; (c) Sustainably increased production and productivity of the livestock and crops subsectors to supply domestic as well as export markets; and (d) Improved efficiency and profitability for all actors along agricultural value chains. To achieve these outcomes, the ASGIP proposes four programs of investments and actions:(i) Governance, Knowledge Management & Innovation; (ii) National Food & Nutrition Security; (iii) Livestock Production for Import Substitution; and (iv) Crop Production for Export Earnings. The SI ART is fully aligned with the proposed ASGIP and the project scope will contribute to all four programs. The SI ART will be well positioned for the operationalization of the ASGIP through its mainstreaming into MAL and focus on rural communities with the proposed interventions.

- As indicated in the Appendix 1 on PMP, there is a scientific consensus that the effects of an inappropriate use of pesticides can seriously affect human health and the environment. However, based on experience under the RDP II, there is no report of any significant environmental impacts of chemical fertilizer and pesticide use on community health or natural resources (water and soil pollution perspective) and impact. For pre-cautionary purpose, MAL's extension services will use the PMP and good cultural agricultural practices (GAP) (e.g., from NGO or FAO) to train farmers and members of POs on the safe use of chemical fertilizers and pesticides, even in very small quality. Based on the experience of RDP and RDP II, Chemical fertilizers and pesticides are only used by some farmers in the peripheries of Honiara and rural Guadalcanal where they have access to these chemicals because these chemicals are very expensive. 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. In the outer provinces, although the crops significantly suffer from pests, pesticides are hardly used. There are no chemical fertilizer and pesticide outlets, other than the health services malaria vector control unit, which provides icon (Lambda-Cyhalothrin) for mosquito control. Therefore, organic fertilizers have been commonly used or practiced by farmers and producer organizations. Chemical fertilizers and pesticides are of limited use, mostly in some large or intensive commercial farms owned by firms. Small-holder farmers in Solomon Islands could rarely afford to purchase the chemical fertilizers and pesticides. 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. Furthermore, the Biosecurity department at MAL has capacity to conduct pest surveillance programs. As described Appendix 1 on Pesticide Management Plan, collaboration with regional organisations are being called on to assist MAL with pest management where required.

- Most agriculture activities in Solomon Islands are rain fed. Some large farms in Guadalcanal and Malaita manage to have their own irrigation and water supply system. The agriculture sector continues to face several challenges, including the limited availability of suitable agriculture land, the depletion of soil fertility due to intensive land use for logging and mining, the impact of climate change, high internal transport costs, rudimentary or missing infrastructure in terms of

warehouses, processing facilities, roads, wharves and jetties, insufficient or insecure land tenure for small landholders, and limited access to finance and other agricultural support services.

- The country has rich ecosystems and biodiversity. The environment is threatened by unsustainable logging practices, leading to habitat destruction and potential for increased soil erosion, landslides and flooding. High rates of population growth and underemployment lead to pressure to develop an income from cash crops, hence further habitat destruction. Extreme weather events are likely to increase in frequency and severity under the influence of climate change, along with pressure for people to move to higher ground for agricultural and smallstock activities.

- The environmental and social risks associated with the agriculture sector vary based on agricultural typologies. Relevant factors include types of machinery used, production methods, and climate variables.

- The project will target the selected villages of the three provinces of Guadalcanal, Malaita and Makira. These provinces were selected based on objective criteria such as (a) number of food insecure households are higher; (b) more number of smallholders and semi-commercial farmers engaged in agricultural commercialization; (c) maximum number of agribusiness partnerships of RDP II; and (d) the potential for export-oriented value chains.

4.1.1 Guadalcanal Province[4]

- Guadalcanal Province consists of Guadalcanal Island and some small adjacent islands, mostly in the east. Guadalcanal is 160 km long and 45 km wide in the centre. The land area is 5310 km2. Most of the island is covered with tropical forest, except for the Guadalcanal plains, which are dominated by large areas of natural grasslands. The 1974 Land Resources Study identified six 'agricultural opportunity areas' (AOAs) on the island, with a total area of 746 km2. All are located on the northern side of the island, with the Guadalcanal plains being the largest at 337 km2 (45% of the AOAs). Most land on the island is nonregistered customary land (92%), and 8% is registered alienated land.

- Before the ethnic tension, there were 30 staff in the province, and MAL maintained 13 field stations throughout Guadalcanal. The main stations were at Marau, Avuavu, Lambi and Mbabanakira. Most stations have now been abandoned. The remaining staff are mostly living in their own villages, with a few living on the stations and others in Honiara. Currently MAL staff for the Province includes 10 Extension staff and 2 Livestock officers.

- The majority of the nation's livestock products are consumed in Guadalcanal, and Honiara is the major market for sales of domestic livestock. Before the ethnic tension, SI was almost self-reliant in pig and poultry meats, and supplied a substantial percentage of its requirements for beef and table eggs. This supply was produced by a combination of small-scale and medium-scale production units, predominantly in Guadalcanal, Malaita, and Central Province. The majority of the units based on Guadalcanal were destroyed or abandoned during the tension. Pigs are bush slaughtered, packed on ice and delivered to the butchery or restaurants for further processing.

- There are currently no medium- to large-scale broiler farms in SI. A large volume of chicken meat,

[4] draft Agriculture Sector Growth Strategy & Investment Plan (2021-2030)

as whole birds and cuts, is imported into Honiara each week. The primary limitations to the viability of broiler production are the cost of feed. Several commercial hatcheries and broiler and layer farms were operational in peri-urban Honiara before the ethnic tension, but all were destroyed. There are currently no commercial layer farms, and only one commercial broiler farm.

- The abattoir in Honiara was badly damaged during the ethnic tension and there is currently no facility, of significant capacity, to slaughter livestock in Honiara.

4.1.2 Malaita Province

- Malaita Province consists of the main islands of Malaita and Maramasike (small Malaita), together with the outlying island of Ndai and the atolls of Ontong Java and Sikiana. The atoll groups are some distance from Malaita, being 340 km north, and 230 km east, respectively, of northern Malaita. The two main islands are separated by a narrow strait and are about 190 km long in total, and 30 km wide at the widest point. The total land area is about 4200 km2. The Land Resources Study conducted in 1974 identified a number of areas as 'agricultural opportunity areas' (AOAs), with a total area of 536 km2, which is 13% of the land area of the two larger islands.

- The main agricultural office is in the provincial capital, Auki. Currently MAL has 23 staff in the Province (22 from Extension, 1 from Livestock). As with other provinces, research and extension support to the community is restricted by the lack of resources, particularly transportation assets, given the vast distances to be covered by sea and road.

- The Airahu Rural Training Centre north of Auki is run by COM and teaches life skills, agriculture, mechanics and carpentry. The National Agricultural Training Centre (NATI) at Fote has been closed since 1999. The buildings within the Centre have been vandalized, roads are overgrown and houses are occupied by local landowners. The Dala Agricultural Training Centre is also closed. The demise of NATI at Fote meant farmers no longer had ready access to training. As a consequence, in addition to traditional knowledge, farmers are relying on "hear and learn" as well as on knowledge transfer from parents and neighbouring farmers. The demonstration farm at Adaliua (previously funded and technically supported by ROC) is bridging the gap to an extent but this facility is limited in scale. The Adaliua Demonstration farm provides limited planting material and breeds piglets for sale to farmers. The farm currently has 17 sower units and plans to increase this capacity to a 30 sower unit facility.

- There is no abattoir in Malaita. The province also lacks proper storage facilities that can preserve the quality and integrity of perishable goods. Farmers incur losses associated with spoilage or rejection.

- The Provincial government is keen to rehabilitate its dormant grazing land into quality breeding and fattening pasture, especially at the Dala Provincial Farm (98 hectares) and Atori Holding Ground.

- A pineapple-processing plant operated in Auki for two years during 1992–94, but failed because of financial problems. The pineapple juice found a ready local market in Auki.

- Some rice is being grown on Malaita. The most common method of cultivation in the province is dryland farming, and the growing season coincides with the wettest months of the year. Output is generally used for subsistence purposes or seed stock, with only a small proportion sold locally. As with other provinces, the production system was heavily subsidized by ROC and not

sustainable. There was reported 73 hectares under rice production in the province, including seven rice mills during the ROC era.

- About 70% of the copra produced in the province originates from the Auki and Malu'u region, along the road network in north Malaita. There is an old copra oil mill at Malu'u that was jointly owned by the Malu'u Integrated Co-operative Society and CEMA. The mill closed down due to financial difficulties. Copra oil produced by the mill was sent to RIPEL on Rennell Island. Approximately 70–80 tonnes of oil were produced over a two-year period. There was also a copra mill operating at Taalu, south of Auki, which had a capacity of 400 litres of copra oil per day.

- Cocoa is another important source of cash income for villagers, especially in the area between Auki and Malu'u where production is concentrated. There were a number of fermentaries in the north of the province, and in northeast Malaita. Most cocoa plantings in the Auki to Malu'u area will require rehabilitation.

4.1.3 Makira/Ulawa Province

- The province of Makira/Ulawa comprises nine islands with a total land area of 3230 km2. The largest island, Makira (formerly known as San Cristobal), is 140 km long and between 12km and 40 km wide. Ulawa is the second largest island in the province, with a land area of 65 km2. The islands of Ugi, Pio, Three Sisters, Santa Ana and Santa Catalina cover a combined area of about 85 km2. The Land Resources Study identified 200 km2, or 6.5% of the total land area in Makira Province, as being AOAs, suitable for agricultural development. These AOAs are the Hada and Heuru land systems in the northwest of the island, with 97km2 and 73 km2 of land area respectively, and the Harigha land system in the southeast, with 30 km2 land area. The western side of Ulawa Island has 28 km2 of AOAs, mainly suitable for coconut palms because of limited soil depth and highly calcareous soils.

- MAL has 11 staff stationed in Makira/Ulawa. The main agriculture office is in Kirakira while staff are stationed around the province. The staff at Kirakira had to abandon their office building as it is unfit for occupation and had to be pulled down. They are now using a rented facility. Likewise, due to inadequate staff housing, officers have to reside in villages, as is currently the case for the Chief Field Officer. As with other provinces, there is very limited to no extension services support provided to the communities because of a lack of resources .

- As with other provinces, the ROC promoted smallholder rice farming because it was an important food in most rural households. However, production was heavily subsidized. Three rice mills operated in Makira in the past. The rice is generally consumed within the producing households and surplus is sold locally.

- Kirakira butchery was established in the 1990s by the provincial government. Since 2004, the butchery has not been functioning. Cattle are killed and gutted on farm or sold live.

- Five direct micro-expeller (DME) coconut oil units were established in Makira in the past at Tawani Village (Central Bauro) and at the COM plantation at Waimapuru. The virgin oil from the DME units were sold to Kokonut Pacific Solomon Islands in Honiara and exported. The 72-hectare COM plantation at Waimapuru was the only large commercial coconut plantations in operation, where both copra and cocoa were produced.

5 Legal, Policy, and Administrative Frameworks

5.1 Applicable Country Legislation and Regulations

- Relevant environmental and social regulations to address environmental issues and environmental and social risks have been enforced in the Solomon Islands. The most prominent is the Environment Act of 1998, which provides a legal basis for environmental protection and management. This law laid the foundation of Solomon Islands' environmental impacts assessment (EIA) system, which is implemented by the Environment Conservation Division (ECD) of the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM).

5.1.1 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 sets out the functions and the nation'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.

- The Environment Act 1998 provides for an integrated system of development control, environmental impact assessment, and pollution control, including (i) prevention, control and monitoring of pollution, regulating a discharge of pollutants to air, water or land and reducing risks to human health, and prevention of degradation of the environment; (ii) regulating the transport, collection, treatment, storage and disposal of waste and promoting recycling, re-use and recovery or materials in an economically viable manner; and (iii) complying with, and giving effect to, regional and international conventions and obligations relating to the environment.

5.1.2 Environment Regulation 2008

- Environment Regulations 2008 covers detailed requirements for EIA. The Act has a schedule which lists all "prescribed' developments' that need to undergo the EIA process. All prescribed developments require a simple assessment through "screening" or "scoping" process to see what form of additional assessment is required. Most development projects require a PER, while many major projects will also need a second stage of appraisal which include technical, economic, environmental and social investigations presented in an EIA or environmental impact statement (EIS) report. This PER report, equivalent to an ESMP, is a fulfilment of the environmental regulation and Act.

- This law has four parts. Part I Article 4 provides that in the event of a conflict between the Environment Act and other legislation, the provisions of the Environment Act will prevail. Part II establishes and defines the powers and role of ECD - which has since been re-established within the MECDM. Part III provides for development control and establishes the requirements for environmental impact assessment, review, and monitoring. Part III Article 17 requires any developer who proposes to carry out any prescribed development to make an application to the Director of ECD.

- Article 19 specifies that a developer shall not commence or continue to carry out any prescribed development unless the developer has been issued with a development consent (defined in the Act as a consent to carry out any development under Part III).

- There are two levels of environmental assessment: public environment report (PER), as described in Article 20, or if the development is shown to be such a nature as to cause more severe impacts, then the proponent is required to prepare and submit an environmental impact statement (EIS), as described in Article 23.

- Part IV details requirements for pollution control and emissions (noise, odour and electromagnetic radiation) and the requirements for a license to discharge waste, emit noise, odour or electromagnetic radiation from a prescribed premise as described in Article 39. The application for a license shall include any information, plans, specifications and other documents as may be required.

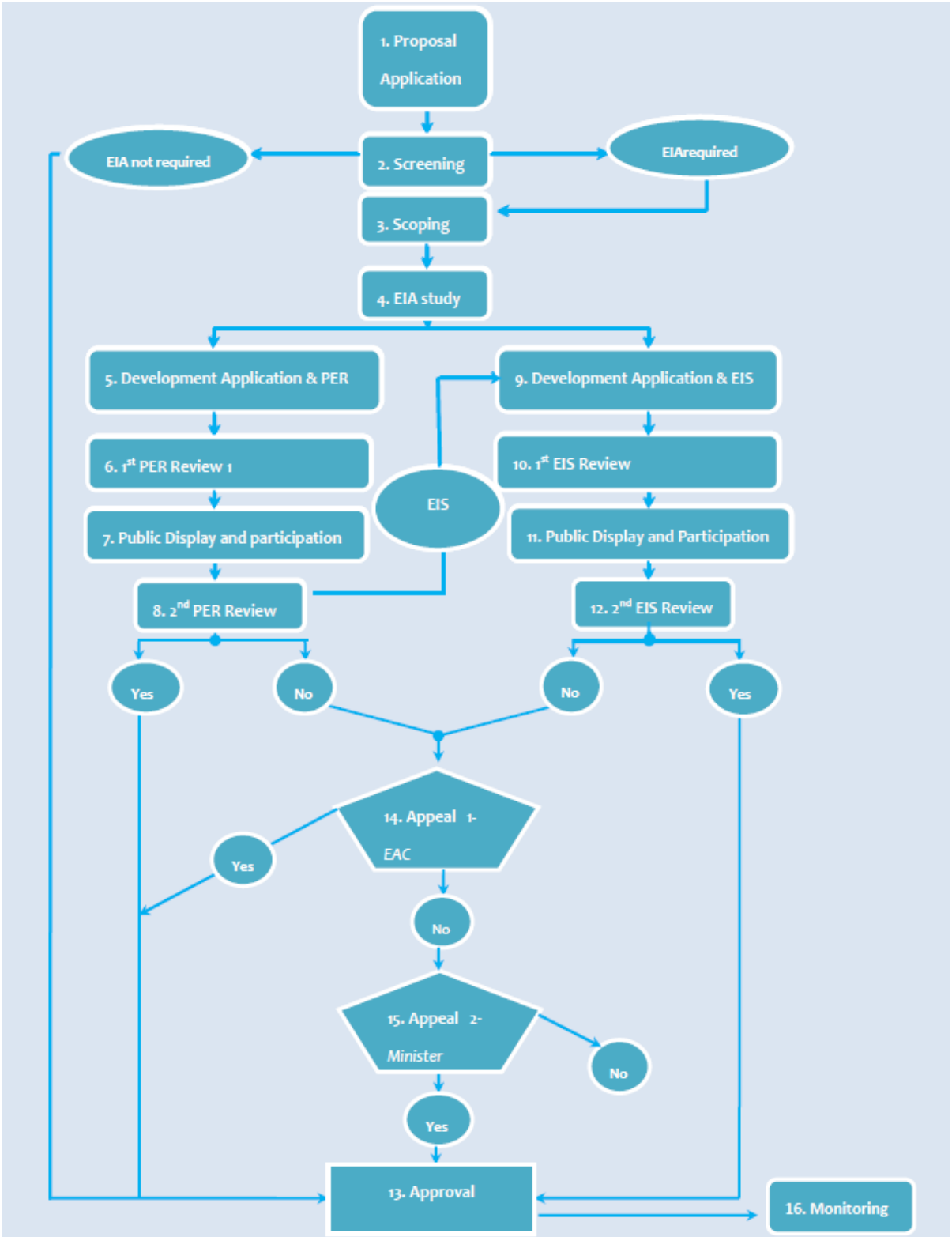
- Solomon Islands' Environment Regulations of 2008 establishes the procedures for undertaking the environmental assessment of prescribed activities and the process of issuing development consent. The regulations detail the process prescribed in the Environment Act of 1998 and set out the contents of PER and EIS.

5.1.3 Environmental Impact Assessment Guidelines (2010)

- The ECD issued the Environmental Impact Assessment Guidelines (2010) to provide basic advice and guidance to government officers, planners, developers, resource owners and those involved in processing development proposals, on the EIA process. The guidelines aim to clearly explain the procedures of EIA outlined in the Environment Act of 1998 and Environment Regulations of 2008. The guidelines describe the procedures needed to be undertaken, forms, and fees required before obtaining the development consent approval.

Figure 1 - EIA procedural steps[5]

[5] ECD, 2010. EIA Guidelines 2010



5.1.4 Health and Covid-19 Regulatory and Policy

5.1.4.1 National COVID-19 Preparedness and Response

- The Solomon Islands has prepared the Consolidated National Preparedness and Response Plan for COVID-19 (issued on March 12, 2020) and an updated Phase 2 plan issued on August 27, 2020.

The Solomon Islands Government (SIG) declared a public health state of emergency on March 26, 2020. This allowed the government to enforce a number of emergency measures and procedures stipulated under its Emergency Act. In early March, MHMS developed a COVID-19 preparedness and response plan (PRP) with support from DFAT, with estimated cost of SBD 20 million (~US$ 2.42 million) largely for PPEs and Consumables. The MHMS was also allocated a supplementary domestic budget of SBD 6.6 million (~US$ 0.8 million) to assist with implementing the plan. The World Bank has increased the financing amount for the First Solomon Islands Transition to Sustainable Growth Development Policy Operation (approved in May 2020) from US$10 million to US$15 million to respond to critical fiscal needs due to COVID-19; and the Solomon Islands Port Authority and Solomon Power (both state owned entities) have together contributed SBD 10 million (~US$1.2 million) towards the COVID-19 response.

- The Solomon Islands, in addition to the internal domestic support for activities related to COVID-19, is also receiving assistance from several development partners (DPs). These include the United Nations (UN-mainly WHO and UNICEF), who are providing personal protective equipment (PPE) along with laboratory supplies, disease surveillance and response technical assistance, and communications support efforts; DFAT is providing a broad range of ongoing technical assistance, as well as funding for budget support and other health related activities (including quarantine facilities, laboratory and medical equipment), as is the New Zealand MFAT (including upgrading the ICU at the National Referral Hospital and a new x-ray machine). The European Union, Asian Development Bank, and China have all contributed financially and in-kind to the MHMS COVID-19 response efforts. The World Bank FTCF investment support has been designed to fill critical gaps in the preparedness and response efforts and complement activities committed by other DPs. In addition, through a multi-year program of advisory and analytics, the World Bank continues to provide advisory and analytical services to MHMS on health financing and related health system strengthening activities.

- The Solomon Islands has established a National Health Emergency Operations Center (NHEOC) to oversee all operations and activities relating to COVID-19. The public health State of Emergency (SOE) remains in effect since March 26, 2020. This allows the government to enforce several emergency measures and procedures stipulated under its Emergency Act. The NHEOC, which was created due to the COVID-19 pandemic, oversees all operations and activities relating to COVID-19. NHEOC reports to the National Disaster Operations Center - Health (NDOC-H) committee which then reports to the Permanent Secretary of MHMS and the Executive Management Team. The NHEOC is located at the NRH and is chaired by a senior medical doctor at NRH. The NHEOC has seven teams reporting to it. These teams are as follows: provincial team, public health team, planning and operation team, clinical team, administration and finance team, and risk-communication team. In addition, the MHMS has established a COVID-19 financing committee to oversee how COVID-19 funds received from various sources are being utilized. The NDOC is located at the MHMS headquarters (physically just across the road from NRH) and is chaired by the Deputy Secretary for Health Improvement.

5.1.4.2 Health Services Act, 1996

- The Health Services Act (1996) sets ups the Ministry of Health and Medical Services (MHMS) who are responsible for the provision of health and medical services in the Solomon Islands. The MHMS provides overall stewardship of the health sector and plays a regulatory role through strategic planning, standard setting and guidelines, for both government and non-state providers. The MHMS is responsible for providing public health services, including maternal and child health,

family planning, school-based outreach, dental services, mental health, and vaccination and immunization. Section 10 (2) of the Health Services Act enables the Ministry to arrange with Provincial Assemblies and the Honiara City Council (HCC) to undertake any of the above-mentioned public health services. Section 13 of the Act also empowers the Ministry to make arrangements with church or voluntary bodies for the provision of health services.

5.1.4.3 Environmental Health Act 1980

- The Environmental Health Act (Public Health Act), enacted on 1st August 1980, provides for the management and control of community health in the Solomon Islands. Mainly administered by the Minister, the provisions also identify Enforcement Authorities for purposes of preventing the occurrence or for checking the spread of any noticeable diseases, provision and protection of water supplies and management of drainage and sanitation practices. Among other items, it empowers the relevant authority on the construction, operation, and management of sewerage systems, including the sewage disposal works. It also provides penalties for the willful pollution of a water supply source. The Public Health Act serves as the Health Impact Assessment reference in identifying the necessary practicable measures for preventing all conditions liable to injurious or dangerous to health arising from the erection, or occupation of the subproject.

- The Environmental Health Act 1980 sets up the administration and structure of community health in Solomon Islands. The Minister of Health is responsible for the administration of environmental health services. The Minister may delegate this administration to the Provincial Government and the HCC which are designated as Enforcement Authorities. The Environmental Health (Public Health Act) Regulations deal with public health issues and how to deal with them when they occur. The regulations empower the Minister and the Under Secretary of the Ministry of Health and Medical Services (MHMS to take specific measures to prevent the occurrence of a public health disease or where such disease had already occurred, to take measures to contain and prevent the spread of the disease.

5.1.4.4 Other health legislative instrument and plan

- To ensure quality of care, key legislative instruments implemented and upheld by the MHMS include:

- Health Workers Act 1989 - which regulates the functions and duties of various categories of health-workers and establishes a Health Workers Board "to prescribe registration, deal with matters pertaining to discipline and other connected matters";

- Medical and Dental Practitioners Act 1988 - "to regulate medical and dental practitioners";

- Nursing Council Act 1987 - which establishes a Nursing Council to register and regulate nurses, midwives and auxiliary nurses; and

- Quarantine Act 1978 - "for the inspection, exclusion, detention, observation, segregation, isolation, protection, treatment, sanitary regulation and disinfection of vessels, persons, goods and things" in order to prevent the introduction or spread of diseases.

- Other relevant plans and policies include the National Health Strategic Plan 2016-2020. The MHMS developed a five-year National Health Strategic Plan 2016-2020. The plan intends to target four key areas; improve service coverage, build strong partnerships, improve service quality and lay

the foundation for the future. National Health outcomes and indicators are developed to ensure all operational plans of the ministry is directed and guided towards achieving this targets and other international objectives.

5.1.5 Wildlife Management and Protection Acts

- **The Wildlife Management and Protection Act 1998** provides for the protection, conservation and management of wildlife in the 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 includes all CITES requirements.

- **The Wildlife Protection and Management Act 2010** provides for the conservation, management and protection of wild flora and fauna in the country. It regulates the export and import of wildlife, ensuring compliance to obligations set under the Convention on International Trade in Endangered Species (CITES). The Solomon Islands is a refuge for many species of wildlife (that includes rare and endemic). Their need for protection and sound management is remarkable. The act prohibits the poaching of wild fauna and flora as well as harvesting of protected species.

5.1.6 Labor Acts

- **The Labor Act 1978** deals with protections for workers. Part IX Care of Workers requires the employer to: provide workers with rations (Article 65); protect workers and dependents from malaria (Article 66); provide workers with an accessible supply of clean, non-polluted water for drinking, washing and other domestic purposes (Article 67); make sufficient and proper sanitary arrangements for workers (Article 68); provide accommodation for the worker and family if they are not conveniently located to the workplace (Article 69).

- Article 70 requires the employer to provide medical care at the workplace including (i) treatment facilities, medicines, first aid equipment and transportation facilities; (ii) responsibility to move workers as quickly as possible either to the employer's treatment facilities or to the nearest medical facilities; (iii) treatment for workers or hospitalization; and (iv) should a worker die the employer is obliged to pay for funeral costs. Article 71 states that the employer may be required to provide medical facilities and services of a medical practitioner, and the employer is to maintain a register of workers treated.

- **The Labor Act (1996)** CHAPTER 73 governs rules relating to employment. The Act defines the allowable hours of work and minimum wages. It outlines workers' rights and employers' penalties for not complying with the requirements. It also includes a prohibition for women working at night and for child labor.

- As noted in the community consultation section, there were concerns, in relation to women working out of daylight hours and the project attempts to enforce this rule. In line with the Act and for safety reasons, night work should not be permitted. Besides, the project should maintain

the requirement for all workers to be over the age of 16 years of age.

5.1.7 Safety at Work Act 1996

- This Act states that every employer has to provide a safe workplace and to ensure the health and safety of employees under his control. This Act is linked to the Labor Act (1978) and the Safety at Work (pesticide Regulations (1983). This Act consists of 4 parts.

    - Part II: Article 4 states that every employer must ensure the health and safety at work of his employees.
    - Article 6: states that the employer must provide a safe workplace for persons other than his employees.
    - Articles 7 and 8: requires manufacturers, suppliers of tools and equipment and suppliers of chemicals and other hazardous substances to ensure that these are safe and without health risks.
    - Article 12: states that any employer who operates unsafe machinery or substances and is injured will be responsible for the damages.
    - Part III: Article 15 requires the employer to protect people from dust, fumes, etc. Article 16 provides for limits of exposure to dust and fumes.
    - Articles 17, 18, 19 and 20 require employers to comply with the operating requirements for (i) pressure and vacuum systems; (ii) machinery; (iii) dangerous machinery; and (iv) electrical installations.
    - Articles 21 and 22 require workplaces to have fire protection and to take precautions against explosions.

5.1.8 Unexploded Ordnance (UXO)

- Technically WWII ordnance found in the Pacific Islands can be defined as either unexploded (UXO) or abandoned (AXO). Unexploded ordnance is defined as explosive ordnance that has been primed, fused, armed or otherwise prepared for use in armed conflict but has failed to explode. Abandoned explosive ordnance is defined as explosive ordnance unused during an armed conflict and subsequently abandoned or left behind. UXO and AXO are defined collectively as Explosive Remnants of War (ERW)[6].

- Solomon Islands was the scene of bitter fighting during World War II. While this was over 60 years ago, unexploded (UXO) may still be found. Should UXO be discovered, the contractor is to immediately cordon off the area, arrange the evacuation of nearby residences and inform the police of the find. Currently, all UXO finds are reported to the police who arrange the pickup, transport, storage and ultimate disposal of the finds. Unexploded Ordnance (UXO) may be concerned for some subprojects. To mitigate the risk, the subproject proponent will contact the relevant professional officer or authority who is responsible for UXO clearance to assess the risk and provide confirmation on UXO safety before any site clearance of construction could be conducted.

- While construction sites are expected to be swept for and cleared of UXOs, a chance finds procedure for handling the UXOs will be the responsibility of the contractor. Ultimately, MAL or

[6] Francis S, L and Alama L, 2011. World War II Unexploded Ordnance, Retrieved at URL on 29thof October 2013 at URL: http://www.forumsec.org/resources/uploads/attachments/documents/UXO%20final.pdf.

the project staff will be responsible for the supervision and monitoring of the contractor.

5.1.9 Provincial Government Act 1997

- **The Provincial Government Act 1997**[7] sets out the functions of Provincial Governments. Several provincial ordinances are significant in terms of environmental management in the country; most focus on natural resource management. Regulatory or executive powers derive from valid provincial ordinances or may be delegated to the province under national statutes, devolution orders, or by negotiation between the province and the responsible national authority. The Devolution Orders made in respect of each province give them legislative competence over a range of matters of direct relevance to natural resource management. However, it seems that the Provincial Governments are not in a position to take on environment management and monitoring responsibilities due to the disconnection between national and provincial governments in implementing action plans.

5.1.10 Bio-Security Act 2013

- This Bio-Security Act 2013 is to prevent the entry of animal and plant pests and disease to the Solomon Islands; to control their establishment and spread in the Solomon Islands, to regulate the movement of animal, plant pest and diseases; and animals and plants and their products; to facilitate international cooperation in respect of animal and plant diseases and related matters. The Act is supported by Bio-Security Regulations 2015.

- According to the draft Agriculture Sector Growth Strategy & Investment Plan (2021-2030), The legal mandate for the Department of Biosecurity rests with the Biosecurity Act 2013, Biosecurity Regulations 2015 and regional and international conventions and agreements including those of the Codex Alimentarius Commission and World Trade Organisation (WTO). The Department covers both imports and exports. It has made significant process in increasing access to markets, for example, working with private actors such as Kokonut Pacific Solomon Islands (KPSI) to improve product quality and gain access to export markets such as Australia and New Zealand. They have also strengthened surveillance of pest and diseases with support from SPC and IFAD. Biosecurity programs are implemented in collaboration with field staff from Extension Services, focusing on pest management and Environmental Health Department, focusing on food safety.

- The Department's key functions are to (i) protect the flora and fauna of SI from invasion of exotic pests and diseases; (ii) provide surveillance and monitoring systems for pests and diseases incursions; (iii) facilitate trade and access to markets in compliance with WTO protocols and other international trade agreements where Solomon Islands is a signatory to; (iv) administer and enforce the Biosecurity Act 2013, its amendment orders and subsequent regulations; (v) provide inspection and certification services for import and export of agricultural produce and products, and (vi) to provide audits of biosecurity systems to reduce non-compliance issues.

5.1.11 Livestock Development Authority Act

5.1.12 Custom Recognition Act 2000

- The Custom Recognition Act 2000 provides recognition to the existence of any customary law and the nature of such customary law in relation to a matter, and its application in or relevance to any particular circumstances shall be ascertained as though they were matters of fact. However,

[7] *EU-assisted Solomon Islands: Environmental Legislative Review, 2018*

the existence shall be provided in the proof as required under section 5 of the act.

5.1.13 Land and Title Act 1996

- The Land and Titles Act is the major legislation that deals with land tenure in the Solomon Islands. Three main categories of land are recognized under the Act, and that includes:

  (1) Customary Land;
  (2) Fixed Term Leases;
  (3) Perpetual Estates

- The Lands and Titles Act has a system of registration of different types of leases which allows individuals and groups to acquire titles to land and own land. However, one must develop the land that has been acquired or registered or else lose the title to the land.

5.2 World Bank's Environmental and Social Policy Application

- Starting in October 2018, the WB applies the Environment and Social Framework (ESF) to all WB-financing projects. The ESF describes the WB Environment and Social policy to ensure that all WB's financing investment projects will meet the 10 Environmental and Social Standards (ESSs) which aim to avoid, minimize, reduce or mitigate the adverse Environment and Social risks and impacts of projects.

- The project's overall Environmental and Social Risk Classification is considered as '**Substantial'** due to (i) the borrower's limited capacity and track record of relying on external consultants; and (ii) nature, characteristics, and typologies of the project are not complex or large and do not involve investments that have a high potential for harming the environment and society. Per the project typologies, adverse environmental and social impacts and risks are anticipated to cause temporary and limited adverse impacts and risks on the environment and human population. Consequently, the Environmental and Social standards (ESSs) 1, 2, 3, 4, 6, 7, and 10 have been screened as relevant. As shown in Table 5, the ESSs 5,8, and 9 were not considered relevant.

Table 5. Environmental and Social Standards Relevance as shown in PAD

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal		
Number	**Description of E & S Standards**	**Relevance**
ESS1	Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS2	Labor and Working Conditions	Relevant
ESS3	Resource Efficiency and Pollution Prevention and Management	Relevant
ESS4	Community Health and Safety	Relevant
ESS5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Not Currently Relevant
ESS6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
ESS7	Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Relevant
ESS8	Cultural Heritage	Not Currently Relevant
ESS9	Financial Intermediaries	Not Currently Relevant
ESS10	Stakeholder Engagement and Information Disclosure	Relevant

Scope and application of the relevant ESSs are explained below.

5.2.1 ESS1 Assessment and Management of Environmental and Social Risks and Impacts

- The project will enhance positive impacts and bring environmental, social, and health benefits such as access to good agronomic and animal husbandry practices in the industry, promotion of organic farming, and improved existing and new infrastructure, assets, and equipment for better commodities, value chains, processing and commercialization as well as institutional building for producer organizations (POs). However, there are potential adverse reversable risks from the agricultural and livestock production, which can pose impacts on workers and community health and safety, particularly with regards to proper and safe use and handling of pesticides and chemical fertilizers. The small infrastructure can pose site-specific nuisance, health and safety concerns. Construction works may result in dust nuisance and, in extreme cases, health injuries to community members. Water sources could be contaminated by the project activities with poor drainage and management of storm water. These impacts and risks will be managed through (i) ECOPs for the known industry and (ii) by the application of good engineering designs and good practices for construction including incorporating environmental mitigation measures (for example, control of works, dust prevention measures, proper management of hazardous and nonhazardous site wastes, and surplus materials) in the technical design and contracultural document.

5.2.2 ESS10 Stakeholder Engagement and Information Disclosure

- ESS10 is relevant as the project recognizes the need for effective and inclusive engagement with all of the relevant stakeholders. MAL has prepared a Stakeholder Engagement Plan (SEP) to engage with stakeholders on the E&S risks of the project and will be disclosed on MAL's official website at http://www.biosecurity.gov.sb. The SEP identifies and analyses key stakeholders (i.e. affected parties, other interested parties and disadvantaged and vulnerable groups) and describes the process and modalities for sharing information on the project activities, incorporating stakeholder feedback into the Project and reporting and disclosure of project documents.

5.2.3 ESS2 Labor and Working Conditions

- ESS2 is relevant due to potential risks on labor and working conditions for all types of workers.

- As discussed in ESS1, labor and working conditions, particularly for workers employed by contractors and suppliers, who are unlikely familiar with core provisions for labor and working condition risk management aligned with ESS2. Labor risks are related to possible accidents or incidents, potential worker lay-off or position transition with the input production and processing facilities, and relatively weak labor law enforcement for seasonal workers at production bases. Under the project, staff can frequently expose safety risks when they are required to travel to the provinces in most cases by mode of boat or small aircraft.

- Occupational Health and Safety (OHS) measures are applicable to all project workers, including the implementing agency, contractors and subcontractors, primary suppliers, and community laborers, which are detailed in the LMP. The community laborers are referred to community residents, members of the producer organisations (POs), farmers, women-led farmers, and/or project beneficiaries mobilized by MAL provincial team or local contractors). Specific attention will be given to sensitization and training of community workers on OHS risks, and the technical knowledge and behavioral awareness to minimize the risks. Project travel safety procedures will be emphasized, and the project will fund all necessary safety equipment associated with project travel, including vessels if necessary. MAL/PMU within MAL will be equipped with strict travel regulation especially in server weather conditions and appropriate safety equipment for example: life jackets, first aid kit and radio phone to reduce the risk of any incident occurring during the travel to the provinces.

5.2.4 ESS3 Resource Efficiency and Pollution Prevention and Management

- ESS3 is relevant given the project could result in pollution as a result of the construction of small-scale infrastructure (via improper erosion and sediment management processes, improper management of waste and hazardous materials), and with changes to agriculture and livestock production (such as increased use of fertilizers and pesticides). The project is not expected to result in substantial or significant point sources of environmental pollution or greenhouse gas (GHG) emissions. Potential pollution and resource damage associated with small-scaled infrastructure, agricultural and livestock development are likely localized, site specific, and manageable with the ECOPs or ESMP for waste and wastewater management for the known industry. The ECOPs or ESMP includes measures to address the damages or loss of vegetation cover and trees; degrade existing landscape; and waste and wastewater generation.

- Indirectly through TA and building capacity of extension services, the project will support better operation-phase guidelines for farmers including better waste management, resource efficiency, and for sustainable practices according to the World Bank guidelines on environmental and social framework (ESF) for technical assistance activities (2019) and ESS3 objectives. MAL has prepared a Pest Management Plan (PMP) in Appendix 1 of the ESMF in accordance with the requirements of the Safety at Work (Pesticide) Regulations 1982 and the requirements of ESS3. The PMP will be implemented to ensure safety for human and the environment associated with the standards-related to transport, storage, handling and disposals of pesticides and agrochemicals including packaging materials.

5.2.5 ESS4 Community Health and Safety

- ESS4 is relevant as the project will invest in agricultural production, smallstock productivity, and small infrastructure can pose potential safety concerns for the communities within the vicinity of works especially when they are carried out by community workers or near a community. The ESMF, SEP, and LMP evaluate the risks and impacts to community health and safety during the project life-cycle and establish preventive and control measures. The project staff and private contractors (for both small infrastructure and agricultural and livestock intervention) will be required to observe a code of conduct for workers, which addresses community health and safety concerns including risks of gender-based and child-labor abuse.

5.2.6 ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement

- Project activities do not require the acquisition of land, cause restrictions on land use or include involuntary Resettlement. Activities under Components 1 and 3 will take place on existing farmland, which is generally owned by smallholders and the government owned or leased land such as facilities that belong to MAL. Activities under Components 1 and 3 will take place on existing farmland, which is generally owned by smallholders and the government owned or leased land. For precautionary approach, MAL includes a land commitment letter and procedure in the ESMF and Environmental and Social Commitment Plan (ESCP).

5.2.7 ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources

- ESS6 is relevant due to potential impacts on animal welfare, biodiversity or supply chain issues and from primary production of living natural resources: rearing of plants and animals, including annual and perennial crop farming, animal husbandry. The project is not anticipated to invest in conversion of natural habitats but farming extension. Aligning with the IFC Good Practice Note on Improving Animal Welfare in Livestock Operations (2014) and the World Bank Group environmental, health and safety (EHS) guidelines, MAL has established the non-eligibility criteria and screening in the ESMF to exclude such activities that involve alien species or any significant risks on biodiversity, animal welfare, land conversion or legally protected natural resources.

5.2.8 ESS7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities

- ESS7 is relevant because Solomon Islands including the three target provinces have the

overwhelming majority of indigenous peoples (IPs). Consequently, an IPPF and sub-project IPPs are not prepared since the overwhelming majority of project beneficiaries are IPs, consistent with ESS7 paras 14 and 15. Under ESS7 none of the circumstances requiring FPIC are present for the project activities. The ESMF and SEP require the project staff to ensure that community consultations will be facilitated and documented by the project with the support of two environmental and social consultants.

5.2.9 ESS8 Cultural Heritage

- ESS8 is not considered relevant as the project activities will not open up new agricultural areas, but focus on existing farms and MAL provincial premises, which are unlikely to affect the tangible and intangible cultural heritage and/or access to known physical cultural resources.

- To address unknown archeological or historical remains and objects, including graveyards and/or individual graves, MAL has included Chance Find Procedures (for small infrastructure investments) in the ESMF for the precautionary purpose.

5.2.10 World Bank Group Environmental, Health, and Safety Guidelines

- The project should take into account the World Bank Group's Environmental, Health, and Safety Guidelines (known as the "EHS Guidelines")[8]. The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). It contains the performance levels and measures that are normally acceptable to the WB Group and are generally considered to be achievable in new facilities at reasonable costs by existing technology. The EHS Guidelines apply to the Project has been incorporated into the ESMF and LMP.

5.3 Gap Analysis

- A gap analysis between the WB ESSs and the national legal frameworks has been undertaken and measure to cover gaps are outlined in Table 5.1. A gap analysis identified several differences between the national and the Bank legal frameworks which need some designed gap-filling measures to be included in the ESMF. For example, the World Bank ESSs and the national legal framework on Environmental Assessment are generally aligned in principle and objective. Both include the mitigation hierarchy, and both require screening of subproject investments to determine which level of social and environmental assessment is needed. The Bank requires that stakeholder consultations be undertaken during the planning, implementation and operational phases of the project.

- In all instances, where national regulations differ from the levels and measures presented in the World Bank ESSs and EHS Guidelines, the project is expected to align to whichever is more stringent. Table 5.1 provides a summary of key differences between the WB's environmental and social assessment (ESA) process and the national requirements.

[8] http://documents1.worldbank.org/curated/en/157871484635724258/pdf/112110-WP-Final-General-EHS-Guidelines.pdf, accessed on 30 October 2020.

Table 5.1: Gap Analysis and Filling Measures

EA Stage	WB ESF and ESSs	National Legislation[9]	Gap Filling Measures
Objectives	• Starting in October 2018, the WB applies the Environment and Social Framework (ESF) describing the 10 Environmental and Social Standards (ESSs) which were designed to avoid, minimize, reduce or mitigate the adverse E&S risks and impacts of projects. The WB will assist Borrowers in their application of the ESSs to projects with WB support.	• Environment Act 1998 • The aim of EIA can be divided into two categories. The immediate aim of EIA is to inform the process of decision-making by identifying the potentially significant environmental effects and risks of development proposals. The long-term aim of EIA is to promote sustainable development by ensuring that development proposals do not undermine critical resource and ecological functions or the wellbeing, lifestyle and livelihood of the communities and peoples who depend on them. • General duty to consider environmental impact. • In considering the grant of or further expansion in any existing development, the Director, the Division and the relevant public authority shall have regard as far as practicable to the effect such development or expansion would have on the environment. • Applications for approval • In determining as to whether the developer is required to submit a report referred to in paragraph (a) or (b) of subsection (2), the Director shall take into consideration the significant impact the development is likely to have on the environment and other factors that may be prescribed by regulations made by the Minister under section 55. • Publication of public environmental report and procedure in respect of objections and appeal.	Principles of the WB ESF policy and the project's ESMF, SEP, LMP and ESCP will be applied.
Screening	• The WB will classify all projects into one of four classifications: high risk, substantial risk, moderate risk or low risk. • In determining the appropriate risk classification, the WB will take into account relevant issues, such as the type, location, sensitivity, and scale of the project; the nature and magnitude of the potential E&S risks and impacts; and the capacity and commitment of the Borrower (including any other entity	• Environment Act 1998 • Screening is the first step in the EIA process in which the Consent Authority (CA) or ECD decides on whether or not EIA is required for a development proposal. • Screening of all 'the proposed development type' must lead to a "yes" decision that EIA is required.	Screening for eligibility and potential impacts according to the ESMF

[9] Adopted from the Comparative Analysis of Solomon Islands' Legal Framework and Environment Safeguards in the ADB Safeguard Policy Statement and Solomon Island EIA Review Manual, 2010. Existing National Environmental Act 1998 only regulates EIA for specific project which triggers significant impacts or risks. The Framework approach has not been covered. The rules applicable for subprojects have been incorporated into the contents of the ESMF, which will be adopted during the project implementation.

	responsible for the implementation of the project) to manage the E&S risks and impacts in a manner consistent with the ESSs. • Other areas of risk may also be relevant to the delivery of E&S mitigation measures and outcomes, depending on the specific project and the context in which it is being developed. These could include legal and institutional considerations; the nature of the mitigation and technology being proposed; governance structures and legislation; and considerations relating to stability, conflict or security. The WB will disclose the project's classification and the basis for that classification on the WB's website and in project documents.	○ Environment Impact Assessment is required where the proposed development is likely to have significant adverse environmental impacts. ○ Environmental Impact Assessment is not required where the proposed development is unlikely to cause significant environmental impacts. • Applications for approval	Since the Project is classified as "moderate" to "substantial risk", use the national laws and specific WB's ESS as agreed with WB will be applied.
ESA instrument	• Depending on the project risks and impact, a range of instruments and procedures required to meet the ESSs' objectives, these include ESIA; ESMF; ESMPs, sectoral & regional ESIA; a hazard or risk assessment; environmental and social audit; cumulative impacts assessment (CIA); and social and conflict analysis. The WB provides general guidance for the implementation of each instrument. • Based on the information provided by the Borrower, the WB will conduct E&S due diligence for all projects requesting for WB support. • The Borrower will be required to prepare, submit, and disclose the Environmental and Social Commitment Plan (ESCP) and the Stakeholder Engagement Plan (SEP) to WB before the appraisal.	• The EIA study subsequently follows the scoping where a study is conducted to assess the significant environmental issues and develop adequate mitigation measures and alternatives. The developer is responsible for carrying out the EIA study following the national requirements. The outcome of the study is the production of an environmental report (EIS or PER). The developer should engage qualified and experience	Apply the project's ESMF, ESCP, SEP, and LMP for the subproject to meet the WB and national requirements.
Scope and clearance	• The WB will require the Borrower to carry out appropriate ESA of subprojects, and prepare and implement such subprojects, as follows: (a) high-risk subprojects, following the ESSs; and (b) substantial risk, moderate risk and low-risk subprojects, in accordance with national law and any requirement of the ESSs that the Bank deems relevant to such subprojects. • If the WB is not satisfied that adequate capacity exists on the part of the Borrower, all high risk and, as appropriate, substantial risk subprojects will be subject to prior review and approval by the WB until it is established that adequate capacity exists.	• Environment Act 1998 • Scoping applies to the development proposal, which is identified in the previous stage to undergo EIA. It is principally to identify the main issues to be addressed by an EIA, the information to be collected, the baseline studies that should be carried out and the methodology that should be used to evaluate their significance. It is the stage whereby the Consent Authority identifies and highlights the major impacts of the proposed development. • When the EIA study is completed, the developer must submit the development application (Form 2 of the Environment Regulations) together with an EIA report as determined in the scoping stage. There are two forms of EIA reports that are required in the EIA procedure: Public Environment Report (PER) and Environmental	Apply the ESMF, ESCP, SEP, and LMP for the subproject to meet the WB and national requirements. The subproject documents will be submitted to WB for clearance

	• If the risk rating of a subproject increases to a higher risk rating, the WB will require the Borrower to apply relevant requirements of the ESSs in a manner agreed with the WB. The measures and actions agreed will be included in the ESCP and will be monitored by the WB. • The WB helps Borrower draft the TOR for ESA and identify the scope of ESA, procedures, schedule and outline of the ESA report. • For a high-risk project, the ESS1-10 applied. • For substantial, moderate, and low risk, the national system can be applied with some specific ESSs as deem necessary by WB. • WB prior clearance is required if the implementing agency do not have adequate capacity to ensure effective implementation of the required mitigation measures.	Impact Statement. The developer is required to send only one type of EIA report with the development application. The development application and processing fees will be paid at this stage, and receipts attached to the development application and submitted to the consent authority. • 17. (1) Any developer who proposes to carry out any Applications for prescribed development in the Solomon Islands shall make an application to the Director in such form as may be approved by the Minister. • (2) On receipt of the application referred to in subsection (1), the Director shall within fifteen working days of such receipt advise the developer to submit - (a) a development application accompanied by a public environmental report, together with any additional requirements as notified by the Director; or (b) a development application accompanied by an environmental impact statement, together with any additional requirements as notified by the Director, etc. • (4) Where the Director decides to dispense with the requirements of subsection (2), he shall advise the developer accordingly within the time stipulated in that subsection.	
Public consultation, stakeholder engagement, and grievance redress mechanism (GRM)	• During the ESA process, the Borrower consults project-affected groups and local NGOs about the project's environmental aspects and takes their views into account. • In line with ESS10, preparation of a Stakeholder Engagement Plan (SEP), information disclosure, and establishment and operations of a GRM are required to ensure adequate consultation and transparency. • ESS2 also require the preparation of the labor management procedures (LMP) and an establishment and operation of a GRM for project workers. • For meaningful consultations, the Borrower provides relevant project documents promptly before the consultation in a form and language that are understandable and accessible to the group being consulted. • Minutes of the public meetings are included in the reports.	• Environment Act 1998 • Publication of public environmental report and procedure in respect of objections and appeal. • The Director on being satisfied that a public environmental report meets the requirements of this Act shall cause the public environmental report to be published in such manner as he considers adequate or most effective for bringing it to the attention of all public authorities and other persons, whose interests are likely to be affected by the proposed development. • Publication of environmental impact statement and procedure in respect of objections and appeal. • The Director on being satisfied that an environmental impact statement meets the requirements of this Act shall cause such statement to be published in such manner as he considers adequate or most effective for bringing it to the attention of all public authorities, and other persons whose interests are likely to be affected by the proposed development…. The Constitution provides	Apply the project's ESMF, ESCP, SEP, and LMP for the subproject to meet the WB and national requirements.

		for protection against discrimination. Environment Regulations 2008 require ensuring public participation	
Disclosure	• The WB will disclose documentation relating to the E&S risks and impacts of high risks and substantial risks projects before project appraisal. Once the WB officially receives the report, it will make the EA report in English available to the public through the Infoshop.	• Environment Act 1998 • Act 24(1)(2),30 and Reg 11 & 12: The ECD will publish the EIS document such that it is made available to the public and convene a meeting that ensures public participation. • The notice of the meeting shall be published in the newspaper and posted in public places in the communities, which will be likely affected. The developer will bear any cost associated with the publication of the Notice or EIS. • Environment Regulations 2008 • Where the Director has received the development application and the relevant PER or EIS and other information or documents required by the Director from the applicant, the Director shall within 30 days of receipt of the same, bring or cause to be brought to the notice of the public… • Before the meeting, the Director shall make available to the public and in particular, in the communities, if the proposed prescribed development is to be undertaken in a rural area, copies of the [PER] or the [EIS] as the case may be.	Follow the WB requirements.
ESA supervision	• During project implementation, the WB supervises the project's environmental aspects based on the environmental provisions, and the Borrower's reporting arrangement agreed in the loan agreement and described in the other project documentation, to determine whether the Borrower's compliance with the environmental covenant (primarily with ESMP) is satisfactory. If compliance is not satisfactory, the WB will discuss with the Borrower action necessary to comply.	• Monitoring will be carried out by the Consent Authority (ECD) according to its monitoring programme and will concentrate on the developer's Environmental and Social Management Plan (ESMP). This monitoring should focus on the environmental impacts, the effectiveness of the mitigation measures, standards adopted by the developer for the protection of the environment. The developer may also execute its internal monitoring based on its monitoring plan.	Apply the project's ESMF, ESCP, SEP, and LMP for the subproject to meet the WB and national requirements.

6 Potential Environmental and Social Impacts

6.1 Summary of key environmental and social risks

- The environmental and social risks associated with sub-projects vary based on sub-project typology. The project activities which have the potential to generate environmental and social impacts include the construction of small-scale infrastructure, the operation of pig breeding facility and/or slaughter slabs for smallstock, the operation of machinery and equipment purchased under the project and the general impacts associated with new or increased agricultural operations. The project's technical assistance and capacity building activities are expected to provide positive outcomes through applying the World Bank 's Advisory Note on Technical Assistance and the Environmental and Social Framework (2019). No eligible project investments would generate significant or irreversible adverse environmental and social impacts.

- Potential environmental and social risks are further described in Subsections 6.2 and 6.3. The anticipated activities and the causes of the project impacts are listed in Table 6.1.

Table 6.1: Anticipated Activities and Causes of the Project Impacts

Typology	Activity	Potential impact	Source/cause of Impact
(i) Productive Infrastructure and small infrastructure	**For Agriculture:** • Mini feed mills to process harvested feed crops: 1 - 2 tons capacity per day • Renovating or establishing existing or new Field Experimentation Stations **For Smallstock:** • Site clearance, design and onstruction or upgrading of national research headquarters, pig multiplier centre, pig breeding farm or facility, pig and poultry sheds and night shelter; poultry nest-boxes for hens to lay eggs and hatch chicks; small-scale poultry hatcheries; pig farrowing crates to reduce piglet mortality; • Construction of slaughter slabs, to be located in strategic pig production areas to facilitate the hygienic off-the-ground slaughter **For Agriculture and Smallstock:** • Existing/new provincial offices, training centres, storage facilities or storage assets, housing management assets, and mobility assets (Vehicle, Boat, etc.) around the agriculture commodity and smallstock-specific value chains. • Rehabilitation or construction of existing/new offices • Feeder road or footpaths on existing footprints to avoid land acquisition and related resettlement impacts.	• Damages or loss of vegetation cover and trees • Loss or degradation of valuable natural/ ecological resources • Degrade existing landscape • Solid waste generation • Wastewater generation • Chemicals, hazardous wastes generation • Dust, air pollution • Noise and Vibration • Social disturbance to the local community such as traffic/ transportation, water supply-demand, and community meetings events/ etc. • Safety risk to community and Workers health and safety. • Operations of slaughtering smallstock can result in waste spills, introduce enteric pathogens and excess nutrients that can runoff into surface waters or leach into groundwater resources, potentially causing contamination of groundwater resources. • Social disturbance and disadvantage of vulnerable individuals	• Natural resources, such as water are used. Energy/fuel supply is needed. There is safety risk during operation Waste, and wastewater will be generated • site clearing, design and construction Mobilization of construction tools, equipment, vehicles, plants, materials, workers • Concrete mixing, materials preparation • Excavation, backfill • Extraction of aggregates (sand gravel etc.) • waste management issues • Distribution of project assets • Pig breeding facility
(ii) Agricultural and	**For Agriculture:**	• Impact on health and safety of project-affected communities, particularly	• Resources are used • Cultivation

Typology	Activity	Potential impact	Source/cause of Impact
smallstock production, farming, and product processing	• Seeds, planting materials cultivation and harvesting tools, processing equipment, honey extractors and harvesting tools • Production of feed crops; insect-protein feed production equipment • Increased use of agro-industrial byproducts **For smallstock:** • Chicken and pig feeds will be formulated by piloting feed producing units using locally available materials • Crossbreeding sows or pig breeding for semi-commercial farms to improve weight gain • Improved feeds, using cassava and other available feedstuffs • Feed crop production (cassava, high-protein beans)	concerning the safe use and handling of pesticides and chemical fertilizers • Water contamination from inappropriate use of agriculture chemicals • Environmental pollution from biodegradable and non-biodegradable solid waste from agriculture activities • Animal feed (e.g. cassava) competing with human food • Social disturbance and disadvantage of vulnerable individuals	• Smallstock production • Products are created, • Raw materials • Processing • Distribution of project assets
(iii) Technical assistance and capacity building under all components	• Formation, Nurturing, and Strengthening of New Producers Organizations (POs) and Business Plan Development for POs • Agricultural Production and Agribusiness Grants to nurture and strengthen Producer Organizations (POs) • • Capacity Building and Extension service training during pre-production, production, processing, value addition, transportation, and marketing • Working Capital cost for Productive infrastructure/tools/equipment • Repair and maintenance of machinery such as Coconut oil mill, cocoa drier, etc. will be borne by the Producer Organization • Training of Trainers (ToTs) for MAL staff, Training of Community Resource Persons (CRPsCRPs), Training of participating farmers or PO members. Training for the CRPs who will provide extension services at the doorstep of farmers. The E&S risk management skills shall be integrated into these training materials as much as possible. All training events must be COVID-19 safe. • Hiring of Young Professionals from FAFF, SINU and/or from other recognized universities in the region to fill vacant positions in extension • Internship of diploma and degree students of FAFF, SINU for project requirement	• TA activities as currently proposed would not cause any adverse environmental impacts.	• Technical services, including awareness training and capacity strengthening, are expected to focus on sustainable farming practices thus unlikely to cause negative socio-environmental impacts.

Typology	Activity	Potential impact	Source/cause of Impact
	• Veterinary and husbandry support services and Good Smallstock Management Practice to POs including supports on basic protocols, standard operating procedures, and business plan; and to farmers through AEOs, CRPs and agri-business partners.		

6.2 Positive Impacts

- The project's technical assistance and capacity building activities will largely contribute to positive environmental and social benefits to institutions in carrying out or overseeing activities. For instance, the project will largely benefit the population as it aims to provide training and build the capacity development of the staff in MAL (particularly the Agriculture Extension Officers and Livestock Officers), to develop training modules for producer organisations (POs), provide training for farmers, facilitate private sector and NGOs link to POs and use new technology for outreach activities. However, as the project is designed around a value chain approach, the risk of having many actors (consisting of representatives from POs, traders, processors, exporters, Commodity Export Marketing Authority (CEMA), Pacific Horticultural and Agricultural Market Access (PHAMA), Solomon Islands Chamber of Commerce and Industry (SICCI), relevant ministries, development partners, etc.) may delay the project because of a lack in coordination. A detailed SEP will be prepared to capture a streamlined approach looking at the collaboration of each party involved at different phases of the project.

- The project will provide various capacity building and technical assistance activities, and as such MAL team will apply the World Bank's Guidance for Technical Assistance and the Environmental and Social Framework (2019), [10] for example, including environmental and social (E&S) principles in the terms of reference (TOR) of technical assistance and training modules to enhance the positive E&S outcomes. Accordingly, Terms of References for the capacity building and technical assistance activities will be approved by the Bank to ensure the consultancy outputs will enhance the positive environmental and social benefits. Furthermore, extension services and training to farmers will include safe use and handling of all agrochemicals: pesticides, chemical fertilizers and soil amendments, agricultural discharge to surface water through runoff of pesticides. The agendas of training of trainers (TOT) for producer organization would integrate the environmental, safety and health (EHS) requirements including environmental protection measures, good animal welfare, pest and pesticide management, worker and community health and safety measures, … etc. The aim is to enhance the environmental, safety and health (EHS) sustainability for the community beneficiaries and producer organizations.

- Overall, the project activities will deliver positive outcomes to the country including economic development and community livelihood opportunities, capacity training and building to the staff of MAL and new technology for outreach activities for producer organizations (POs), smallholder farmers, and the private sector. The project will build capacity working with smallholder farmers through improved agriculture extension and advisory services which will lead to higher productivity and production, including more equitable representation of women.

6.3 Negative Impacts

- The project typologies and activities can pose some pollution and other adverse environmental impacts. Pollution may arise from mishandling or inappropriate disposal of oils, cement, and waste management. Water sources could be contaminated by the project activities with poor drainage and management of storm water. Construction works may result in dust nuisance and, in extreme cases, health injuries to community members. In addition, poor design of infrastructure or poor practice during construction may lead to damage to natural drainage channels and soil erosion.

- Furthermore, there can be impacts on workers and community health and safety, particularly with regards to proper and safe use and handling of pesticides and chemical fertilizers. The project will not fund any major civil works however the risk of GBV is high in the country, and in recognizing the role of women in

[10] Further information at https://www.worldbank.org/en/projects-operations/environmental-and-social-policies

the agriculture sector, measures to mitigate and prevent any forms of adverse impacts on workers and community environment, health and safety (EHS), sexual exploitation, and abuse or sexual harassment (SEA/SH) will be done through MAL's extension services, awareness raising, code of practice to minimise potential risks.

- With the implementation of appropriate E&S risk management, the project has been assessed as unlikely to cause any long-term negative impacts. SAs discussed in Table 6.1. on potential impacts, per the project typologies, their nature, magnitude, and characteristics of environmental and social impacts and risks can be classified as the following:

  - Agriculture and smallstock activities can trigger risks related to (i) pollution generation or generation of hazardous and non-hazardous waste, (ii) possible use of a large number of polybags for community plants/seedlings/nurseries, and agricultural-related impact on soil and water; and (iii) increased usage of fertiliser, pesticide, insecticide and herbicides leading to health risks impacts due to, for example, poor pesticide storage, handling and application by farmers and producer organizations. There can be health and safety concerns if Pest management Plan (PMP, in Appendix 1) is ineffectively educated and applied for enhancing the production of cocoa, coconut or other crops. Currently, only minimal amounts of pesticide and fertilizer are used by farmers in the Solomons, and most farmers do not use any.
  - Productive infrastructure and assets for agriculture and smallstock can cause (i) readily manageable and localizable impacts such as nuisance during the construction and operation phases; and (ii) concerns over occupational health and safety (OHS), for example, related to falling from a height, hazardous wastes, mechanical damage by operating machines, inhaling fine particles in processing of agronomic products. According to the RDP II experience, the potential impacts were low to moderate with the implementation of appropriate safeguards. However, operations of smallstock slaughter could lead to a substantial risk of environmental impact without proper training and without implementation of appropriate waste management procedures and hygiene, health, and safety standards, required by the FAO guidelines[11].
  - Infrastructure rehabilitation: potential environmental impacts are likely temporary, reversible, and manageable. Impacts in the construction phase may include temporary erosion due to construction and removal of vegetation, stormwater runoff, sedimentation of water bodies, dust, pollution from inappropriate/hazardous construction materials, waste disposal, community and worker health and safety.
  - The local communities may be exposed to increased traffic transporting construction materials and equipment or products for the subprojects in the countryside. The potential adverse environmental impacts at the operating stage should be minimal and could be tackled through the agriculture extension service and could be typically anticipated with high probability in scope, magnitude, location, duration and type. The subproject screening for identifying eligibility and impacts are covered in the subsection on Procedure for Implementation in the ESMF. The ESMF also covers the Environmental Code of Practices (ECOPs) for known-industry impacts in the agriculture and livestock sector.
  - Travel to remote areas associated with the implementation of the project activities, including island crossings, will expose the project workers to considerable health and safety risks, as experienced during the RDP II Project. The project design will consider advisory and budget support to ensure

[11] http://www.fao.org/3/t0034e/T0034E01.htm, accessed on 30 October 2020.

safe travel procedures can be developed, resourced and implemented.

- An additional social risk for the project is that marginalized and vulnerable social groups are unable to access services because of their inability to work on the land, gender stereotypes, or perceptions regarding physical disabilities. To mitigate this, the project will prioritise the marginalized and vulnerable groups and promote gender in activities such as developing and strengthening POs with equitable women representation and support women-led enterprises who want to establish agribusiness partnerships. This will benefit women who make up the majority of the market sellers in rural areas, often they are the ones cultivating the land, especially in the provinces. There will be no major civil works under the project however the risk of GBV is high in the country, and in recognising the role of women in the agriculture sector, measures to mitigate and prevent any forms of sexual exploitation and abuse or sexual harassment (SEA/SH) will be done through awareness raising, code of practice to minimise potential risks.
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- These environmental and social impacts can be grouped into (i) negative impacts of agricultural and smallstock production and (ii) negative impacts of small infrastructure as described in the following subsections. Sources and causes of the project impacts will be further screened and assessed (by the project staff) during the project implementation. Apart from the operation of pig breeding facility and slaughter slabs, potential environment and health and safety concerns associated with Components 1,2, and 3 are expected to be site-specific, localisable, and readily-managed through Environmental Code of Practices (ECOPs).

6.3.1 Negative Impacts of Agricultural and Smallstock Production

- Negative impacts of agricultural and smallstock production, procurement of equipment, chemicals, and provision of services are expected to be minor environmental, social, health and safety issues. The negative environmental and social impacts related to existing farming practice includes intensified smallstock production, agrochemicals and improper disposal of packaging materials causing environmental pollution and health concerns for farmers. Table 4.2 describes the potential adverse environmental impacts of agricultural and smallstock activities.

Table 6.2: Negative Impacts of Agricultural and Smallstock Production and Processing

Type	Potential Impacts and Risks	Typical activities that cause potential impacts/risks
(i) Agricultural production and processing	• Impact[12] on health and safety of project-affected communities, particularly regarding the safe use and handling of pesticides and chemical fertilizers	• Use and handling of pesticides and chemical fertilizers • Waste awareness-training and waste management plan.
	• Environmental pollution from biodegradable and non-biodegradable solid waste from agriculture activities	• Use of natural and other non-biodegradable materials for agricultural activities. •
	• Low environmental impact of point source pollution from the agricultural processing industry results from the	• Usage of water for general cleaning purposes.

[12] The project will not finance these hazardous materials; however, transformation of land ownership may potentially introduce new famers to the materials.

Type	Potential Impacts and Risks	Typical activities that cause potential impacts/risks
	usage of chemicals and discharge of wastes.	• Discharge of waste, wastewater, and used chemicals for production or processing.
(ii) Smallstock production and processing	• Water contamination from intensified smallstock production, inappropriate use of agricultural fertilizers and chemicals	• Discharge of waste and wastewater •
	• Environmental pollution from biodegradable and non-biodegradable solid waste from agriculture activities	• Use of natural and other non-biodegradable materials for smallstock activities. •
	• A substantial environmental impact of point source pollution and the smallstock processing industry results from the discharge of wastewater. Most processes in smallstock slaughtering require the use of water and warm water.	• Discharge of waste and wastewater • Usage of water and hot water for general cleaning purposes.

6.3.2 Negative Impacts of Small Infrastructure

- The negative environmental and social impacts related construction and operation of productive and small infrastructure are mostly temporary social disturbances. The potential impacts of the physical infrastructure intervention at various stages are summarized in Table 4.3.

Table 6.3: Negative Impacts of Small Infrastructure

No.	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause potential impacts/risks
CONSTRUCTION PHASE OF SMALL INFRASTRUCTURE			
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 the construction phase. This impact can be avoided, minimized or mitigated.	• Site clearance for a construction site, camps, • Construction material exploitation and/or storage

No.	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause potential impacts/risks
2.	Loss or degradation of valuable natural/ ecological resources	• Sand or gravel from reserved beaches or riverbeds should be protected and not extracted or procured construction. • Coral 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 a great variety of fish and marine life. • If large amounts of sand, gravel and stones from the riverbed are extracted, the flowing pattern of the 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 riverbeds and banks and thereby cause serious problems elsewhere • Protected areas, wetland, mangrove area, swamp, bird sanctuary, seagrass beds are essential to biodiversity and earth and may also have valuable landscape. • Some sites may be significant to local communities in cultural/religious/ historical/archaeological aspects. • If construction takes place at or nearby such sensitive socio-environmental features, threats or severe/ permanent damages may be caused to such sites. Such potential high impacts should be identified in the early stage of subproject planning and avoided in the ART project.	• Site/land clearance • Construction Excavation • Natural resource for construction materials at important sites particularly corals from the sea, trees from a protected area, sand and gravel from riverbeds etc.
3.	Degrade existing landscape	• These impacts may occur when vegetation cover/topsoil is removed, or man-made structures are introduced into least disturbing nature, or when new structures obstruct the view to an existing beautiful landscape	• Site/land clearance • Site excavation • Construction of new facilities in areas with beautiful/valuable landscape
4.	Solid Waste generation	• Demolished building materials • Excavation and construction-generated waste • Adequacy of reused and recycled waste per the national environmental requirements. • Agriculture production and processing waste • Waste is also generated from unused materials: timber/glass/metal, packaging materials or by the workers: lunch containers, leftover food etc.	• Site/land clearance • Temporary storage and disposal of demolished building materials • Excavation & construction activities • Agriculture production and processing • Construction workers daily domestic activities
5.	Wastewater generation	• Wastewater generated by workers from washing and toileting. • Improper management of wastes which could result in soil/ surface water/ groundwater pollution. • Agriculture production and processing waste. Uncontrolled generation of wastewater may cause	• Agriculture production and processing • Use of construction materials • Workers domestic activities at the sites

No.	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause potential impacts/risks
		environmental pollution, nuisance, and health concerns to workers and the public.	
6.	Chemicals, hazardous wastes generation	• Used Oil, paints, fuel, lubricant, batteries, and asbestos-containing materials in the existing buildings are toxic. Some of the solid waste may be cross-contaminated with oil, paints etc. that may be toxic and pose a public or community health risk • Used chemical containers/spillage	• site clearing, design and construction • Vehicle use and maintenance • Painting • Poor storage and disposal of hazardous • Using agricultural chemicals
7.	Dust, air pollution	• Exposure to dust and smoke may have health impact: affect the respiratory system, eyes	• Site clearance and construction • Excavation • Running engine • Machinery • Construction material loading and unloading
8.	Noise and Vibration	• Noise disturbs hearing/listening activities and may cause stress/headaches • Vibration may cause cracks /damages to • existing structures	• Pile driving • Soil compaction • Machinery
9.	Increased erosion risks/siltation/ sedimentation	• Slops become less stable when the ground surface is disturbed; water can run faster and can erode the soil on bare slop where vegetation cover does not exist. Therefore, erosion, landslide risks would be increase if a building is located on a hilly slope or construction activities disturb slops. • The eroded topsoil will end up at downslope then being wash down further by rainwater causing highly turbid water and riverbed/stream siltation/sedimentation	• Site clearance • Excavation activities create an unsealed/barren area without vegetation cover during and after construction • Construction works carried out on steep and/or weak slops
10.	Water quality degradation, salinity intrusion risks	• Waste and wastewater, construction materials from construction may be leaked or disposed of into water sources nearby construction sites or downstream of construction sites. • 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. • Careless water use activities by workers, for example, washing working tools directly at water sources. • Oil, fuel or any other liquid substance used during construction, including on-site machinery maintenance, maybe leaked or spilled into the soil. Then rainwater may wash such contaminant to nearby water bodies	• Construction of jetty, bridges, pier on streams, riverbeds • Demolished building waste, • Construction waste • Wastewater discharge • Tools and machine washing and maintenance • Surface runoff

No.	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause potential impacts/risks
		• When fresh water is extracted from a drilled well near a shoreline, localised water level drawdown will occur. If the salt-fresh water interfere located nearby the well or groundwater is over withdrawn, saline water may be mobilised into the well	• groundwater extraction during the construction phase • location of well or borehole close to saline areas
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 a low-lying area where drainage is poor	• Construction solid materials and waste loading, dumping
12.	Impacts on cultural sites such as a church, historical site, graveyard, etc.	• Cultural sites may be affected with dust, noise from material and waste loading/disposals • Some artefacts may expose during the execution of earthworks at the sites	• Dust and noise generated activities Loading/unloading construction materials and wastes
13.	Social disturbance to the local community: traffic/ transportation water supply irrigation farming, community meetings events/ etc.	• If the works are carried out on or near the existing road, construction activities may disturb or disrupt traffic on the existing roads. • Excavation may also cause loss to vegetation cover or disturbance to the ground Excavation works may disrupt the operations thus the services provided by existing local facilities such as water supply, drainage, power supply etc. if the pipes/lines cross excavated areas • Stockpiles formed from excavated materials If construction activities take place near a farming area, access to farmland may be interrupted; materials, waste, and wastewater from construction sites may enter farms causing productivity reduction and social conflicts • Suppose a construction site is located near a community centre, school, health centre, or church. In that case, material loads or noise from material cutting, drilling, welding, may block access to community centres or disturb hearings in public meetings. • Temporary water shortage due to higher demand or temporary disruption	• Site clearance • Excavation • Machinery operation • Construction work • Temporary blockage of rivers/streams/ existing irrigation canal for construction • Temporary block of the road for construction of connection section to a new alignment • Increased water demand during construction or temporary disruption of supply
14.	Health/ sanitation /hygiene in the local community	• Stagnant water formed from a disturbed area at the construction site is a favour for mosquito breeding, which is a vector of water-borne diseases • Waste generated from workers staying at the site may attract vermin and insects • Wastewater generation may cause nuisance and health risks to human	• Excavation create holes or low laying spots • Workers improper disposal of wastes, open toilets • Increased water use

No.	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause potential impacts/risks
15.	Safety risk to the community	• Construction-related activities may cause safety risks for the local community, particularly children if they access to open holes or present at the site during materials transports/loading/unloading.	• Transportation of materials/wastes • Materials loading/unloading • Excavated holes • Machinery operations
7.	Workers Health and safety	• Some toxic materials such as paint, oil, the battery may be used during construction. Some construction materials may contain asbestos. • If workers are in contacts such materials without proper protection, health hazard may be resulted from the handling, breathing from such materials. • Unprotected holes at the sites, exposure to traffic at the roadside, improperly installed electrical wires, operating and handling of construction plants, machinery and tools may cause safety risks to workers • Spread of Communicable infectious diseases such as COVID-19	• General construction activities, operations of tools and plants in contact with hazardous substances such as paints etc. • Sick workers close contact, working when sick, untreated workers
OPERATION PHASE OF SMALL INFRASTRUCTURE			
17.	Water/soil pollution	• Leakage or discharge of wastes and wastewater generated from the facilities	• Water use activities taking place at buildings/ shelters
		• Effluent from the septic tank can pollute groundwater or surface water, particularly if piped to an open drain • Partly treated effluent from the 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 • Smallstock facility operations • Agricultural processing facilities
19.	Visual impacts	• If the facility stands out in a public area and degrades the surrounding landscape value • Looks messy due to incomplete infrastructure or improper storage of materials and wastes • If construction site not rehabilitated after construction	• Sanitation/ drainage facilities • Infrastructure not completed to the standard • Poor operation management of infrastructure • Negligence

No.	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause potential impacts/risks
20.	Nuisance, odour, Unhygienic condition, public health risks	• Septic tank effluent is smelly thus may cause a nuisance to the public when being felt/seen Septic tank effluent is only partially treated thus can spread infection and disease thus pose a health risk. • Lack of proper drain around public taps creates muddy mess around the tap or in the yard. Standing water become mosquito breeding ground and cause inconvenience for water users • Open or missing faucet can spill much water in a day. Valuable water that other users may need is wasted • Odour and unhygienic condition form smallstock and /or processing facilities	• Sanitation • Poorly designed or constructed facilities • Poor site selection • Poor management of operations of facilities and negligence
21.	Pollution caused by hazardous wastes	• The operation of some types of infrastructure provided by SI ART may generate hazardous waste such as used batteries, or animal health wastes at smallstock production centres. • Pollution waste oil and fuel spillage from generator use in processing facilities	• Solar driers and solar power systems • Animal health activities • Generator use in processing facilities
22.	Unhygienic condition, public health risks	• Excess water, muddy condition/siltation at water outlets lead to unhygienic conditions and/or mosquitoes breeding	• Water use at processing facilities • Poor drainage
23.	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 need to social conflict between different groups.	• Water use at processing facilities
24.	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. However, damages the objects in the surroundings and these objects cause damages to the facilities provided by the Project, for example, tree fallings into them.	• Cyclones Tsunami torrential rain • Poorly designed and constructed infrastructure • Poor selection of site

No.	Potential Impacts/ Risks	Description of the issues/risks	Typical activities that cause potential impacts/risks
25	Community conflict due to perceived/actual unfair distribution of project assets	• Perceived or actual inequality in distribution of project assets • Unfair outcomes or loss of opportunities for vulnerable people/communities	• Unclear or opaque application processes • Poor assessment of social risks • Poor grievance management

6.4 Due diligence and lessons learned from RDP and RDP II Projects

- Lessons learned from the Implementation Completion Report and Mid-term review report of the RDP and RDP II projects show that three is limited knowledge or understanding of environmental and social impacts and mitigation measures amongst province-based staff, contractors, and communities. Furthermore, the negative environmental impacts and risks are mostly associated with local disturbances of ground and vegetation cover, cutting of small numbers of trees for timber, soil erosion, agricultural land and water degradation, use of agro-chemicals and fertilizers, temporary construction impacts such as dust, noise, waste and wastewater generation, safety and hygiene risks. These impacts are all happening on very small scale, are confined to the project's sites, and manageable with standard good housekeeping approaches such as Environmental Code of Practices (ECOPs) or generic environmental management plan.

- The Lessons learned from implementing the safeguards instruments also include (i) enhanced monitoring and reporting of environmental and social issues should be ensured as part of the project operation and (ii) consistent and persistent efforts of the Bank team to continue providing hands-on support to the communities and the province-based staff to ensure issues related to the environmental and social risk management are continuously monitored and followed up on. Under RDPII, an external E&S safeguards specialist has been hired for screening, assessing, and resolving safeguard issues both prior to a sub-project being included in the program and during sub-project implementation. A few specific areas which are applicable to the project include but not limited to:

  - Pesticides Management: much of agriculture and smallstock practices are of low intensity, and smallholder farmers use only limited quantities of approved fertilizers and/or chemicals. Besides, the project has strengthened the implementation of integrated pest management strategies.
  - Environmental health and safety: a primary concern is the travel safety of the project staff to remote rural locations due to the unpredictable nature of the weather conditions in the country. Thus, the project should continuously have safety equipment (life jacket, epirb, radio phone etc.) in addition to life jackets while travelling by boat to remote locations.
  - Land agreement: although the project does not expect any land acquisition or compensation for economical replacement, early consultations are essential to address concern or issues related to land for the project activities. If land must be acquired, there must be Land Commitment Letter signed by the customary owners and the other community representatives.
  - Institutional Capacity: it was challenging to ensure that all subprojects were ESMF compliant, which caused delays due to the dispersed nature of projects and the considerable expense in getting

specialized staff to do the work. Thus, it is implied that additional support required, and costs involved in working in a limited capacity environment. The recommendations for improvement include having:

- the E&S training materials updated with examples of scenarios to avoid, e.g. excessive vegetation clearance and unsafe working sites;
- the national manager or coordinator and the two E&S consultants to closely support the provinces in monitoring and supervision of subproject design and planning issues.
- the E&S consultants to assist provincial MAL in completing the various forms (e.g. eligibility and risks screening forms in the ESMF) for subproject level; and closely coordinate with the province-based staff on any potential E&S issues and actions plan as required regularly.

7 Environmental and Social Mitigation Measures

7.1 Preliminary environmental and social risk management

- The overall impact of the project is expected to be positive and none of the sub projects eligible for funding under the project include activities that would be classified as 'High' risk under the World Bank ESF. The following tables provide a preliminary analysis of the type of project activities identified, potential social and environmental impacts that may result from the project activities, key mitigation methods for residual impacts, and tools that may need to be required.

- The project's overall Environmental and Social Risk Classification is 'Substantial' due to two factors: (i) MAL's limited capacity and track record of relying on external consultants and (ii) nature, characteristics, and typologies of the project are neither complex nor large in scale. The project does not involve activities that have a high potential for harming people or the environment. According to the project typologies, adverse environmental impacts are anticipated to cause temporary and limited adverse impacts and risks on the environment and the human population. Impacts in the construction phase may include the dust, noise, solid waste, and social disturbance, such as the traffic safety issue. Therefore, MAL has developed this ESMF to mitigate those environmental and social risks through the step by step process from the subproject screening to the application of E&S risk management or instruments.

- The ESMF is the umbrella instrument and includes mitigation measures such as Environmental Codes of Practices (ECOPs, in Annex 3) and Pesticide Management Plan (PMP, in Appendix 1). For small infrastructure investments (i.e. upgrading of offices, small access roads, etc.), a simple ECOP to be included in the bidding documents and contracts should suffice. The Occupational Health and Safety (OHS) measures apply to all project workers, including direct workers, contractors and subcontractors, primary suppliers, and community laborers (e.g., residents mobilized by MAL provincial team or local contractors). Learning from the travel safety incident in the RDP II, special attention will be given to safe travel practice. Furthermore, environmental and social screening and assessment process, in Subsection 7.3 and Annex 5, will evaluate the risks and impacts to community health and safety during the subproject life-cycle and establish preventive and control measures.

- An Environmental and Social Commitment Plan (ESCP) has been prepared between MAL and the World Bank to ensure adequate budget, staffing and operational arrangements for project environmental and social risk management. The ESCP includes specific activities, responsibilities, a timeframe of activities, and responsibilities on the Bank and borrower side.

- MAL also prepared a Stakeholder Engagement Plan (SEP) for meaningful consultations with relevant stakeholders on the environmental and social risks and extensive community consultation and engagement, especially with the value chain approach. The SEP includes mechanisms to ensure the participation of vulnerable individuals and communities in consultation processed. Given the wide geographic scope of the project, and the wide variety of stakeholders involved, communication and transparent dissemination of information will be crucial to the effectiveness. The project will require strong communication to support effectiveness. Table 6.1 describes the proposed mitigation measures for environmental, social, health and safety impacts probably caused by each project typology.

Table 7.1: Instruments for the Mitigation of Potential Impacts at Subproject Level

Typology	Potential Impacts and Risks	Mitigation and risk management	Instruments	ESS
(i) Productive Infrastructure and small infrastructure	1.1. Apart from the pig breeding facility (e.g., 200sows) and slaughter slabs, construction and operation-related impacts are mainly feces and waste spread to surrounding neighborhoods, polluted water, noise, dust, sedimentation, erosion, waste disposal, management of stormwater, community and workers health and safety	Environmental and social risk management instruments that are integrated into EHS specification in tender docs	• ESMF, including ECOPs in Annex 3. • Environmental, Social, Health and Safety (ESHS) Specifications including the National COVID-19 Preparedness and Response/control measures, should be included in all works contract documents before the start of any subproject implementation. • Site risk screening and assessments to be conducted. • ESIA and/or ESMP as required by ESMF screening procedures. • Subproject specific measures in a subproject ECOP.	• ESS1 • ESS2 • ESS3 • ESS4 • ESS6 • ESS10
	1.2. Demolished building materials, Excavation and construction-generated waste, Construction and operation of smallstock slaughter slabs and pig breeding facility (e.g. 200 sows) feces and waste could spread to surrounding neighborhoods, polluted water,	Adequate options of reused and recycled waste, according to the national environmental requirements, Construction and operation of small stock slaughter slabs and pig breeding facility to be located in strategic pig	• ESIA, ESMP and/or ECOP as required by ESMF screening procedures. • Operational Management Plan for the Smallstock Slaughter Slab and pig breeding facility, according to the national health and Covide-19 safe requirements, the World Bank Group environmental, health and safety (EHS) guidelines, and FAO guidelines: http://www.fao.org/3/t0034e/T0034E01.htm, accessed on 30 October 2020	• ESS1 • ESS2 • ESS3 • ESS4 • ESS6 • ESS10

Typology	Potential Impacts and Risks	Mitigation and risk management	Instruments	ESS
	noise, dust, sedimentation, erosion, waste disposal, management of stormwater, community and workers health and safety	production areas to facilitate the hygienic off-the-ground slaughter		
	2. Health and safety of project personnel travelling to remote sites	Adopt and implement OHS and the National COVID-19 Preparedness and Response measures that are integrated into tender docs	• OHS provision and national COVID-19 control measures	• ESS1 • ESS2 • ESS10
	3. UXOs and Unknown cultural heritage may be surfaced in residential and agricultural lands	UXO clearance and Chance find procedure (CHS)	• UXO clearance according to the national legislation and Chance find procedure (CHS)	• ESS1 • ESS10
(ii) Agricultural and livestock production	1. Impact on health and safety of project-affected communities, particularly vulnerable and marginalized people, regarding the safe use storage handling and disposal of agriculture chemicals (pesticides, chemical fertilizers, livestock medicines and drugs)	Implementation of MAL Guideline, Awareness raising through the MAL Extension and Livestock services, Farmers to receive training on safe use and handling of agricultural chemicals and National COVID-19 Preparedness and Response measures	• Pest Management Plan (PMP) and ECOP (whichever is stricter)	• ESS1 • ESS3 • ESS4 • ESS10
	2. Water contamination from inappropriate use, storage, handling	Awareness-raising through the MAL Extension and Livestock	• PMP and ECOP (whichever is stricter)	• ESS1 • ESS3 • ESS6 • ESS10

Typology	Potential Impacts and Risks	Mitigation and risk management	Instruments	ESS
	and disposal of agriculture chemicals	services must be COVID-19 safe.		
	3. Environmental pollution from biodegradable and non-biodegradable solid waste from agriculture and livestock activities	Awareness-raising through the MAL Extension and Livestock services, SWM measures. Include a section on National COVID-19 Preparedness and Response measures (e.g., social distancing, appropriate masks…)	• PMP and ECOP (whichever is stricter)	• ESS1 • ESS3 • ESS6 • ESS10
(iii) Technical assistance and capacity building activities	• Not cause any adverse environmental impacts • Enhance positive environmental and social outcome	Include E&S principles in the terms of reference (TOR) for Technical services, including extension services and awareness training and capacity building are expected to focus on sustainable farming practices.	• World Bank Guidelines on ESF Application for Technical Assistance (2019)	• ESS1 • ESS2 • ESS3 • ESS4 • ESS6 • ESS10

7.2 Procedure for Implementing Environmental and Social Risk Management

- As discussed in Section 1, the overall Environmental and Social Risk Classification (ESRC) of the ART project is 'substantial". The ESMF has been prepared, and it will be applied to address the potential social and environmental impacts and risks associated with the project or subproject activities. The objective of the ESMF is to provide the implementation procedure to ensure the investment activities will be adequately mitigated in line with the national regulations and the WB's ESF and ESSs. The Procedure includes screening for eligibility; screening for potential impacts and risks; and identifying and assessing the appropriate mitigation measures. The procedure is schematically shown in *Figure 1.*

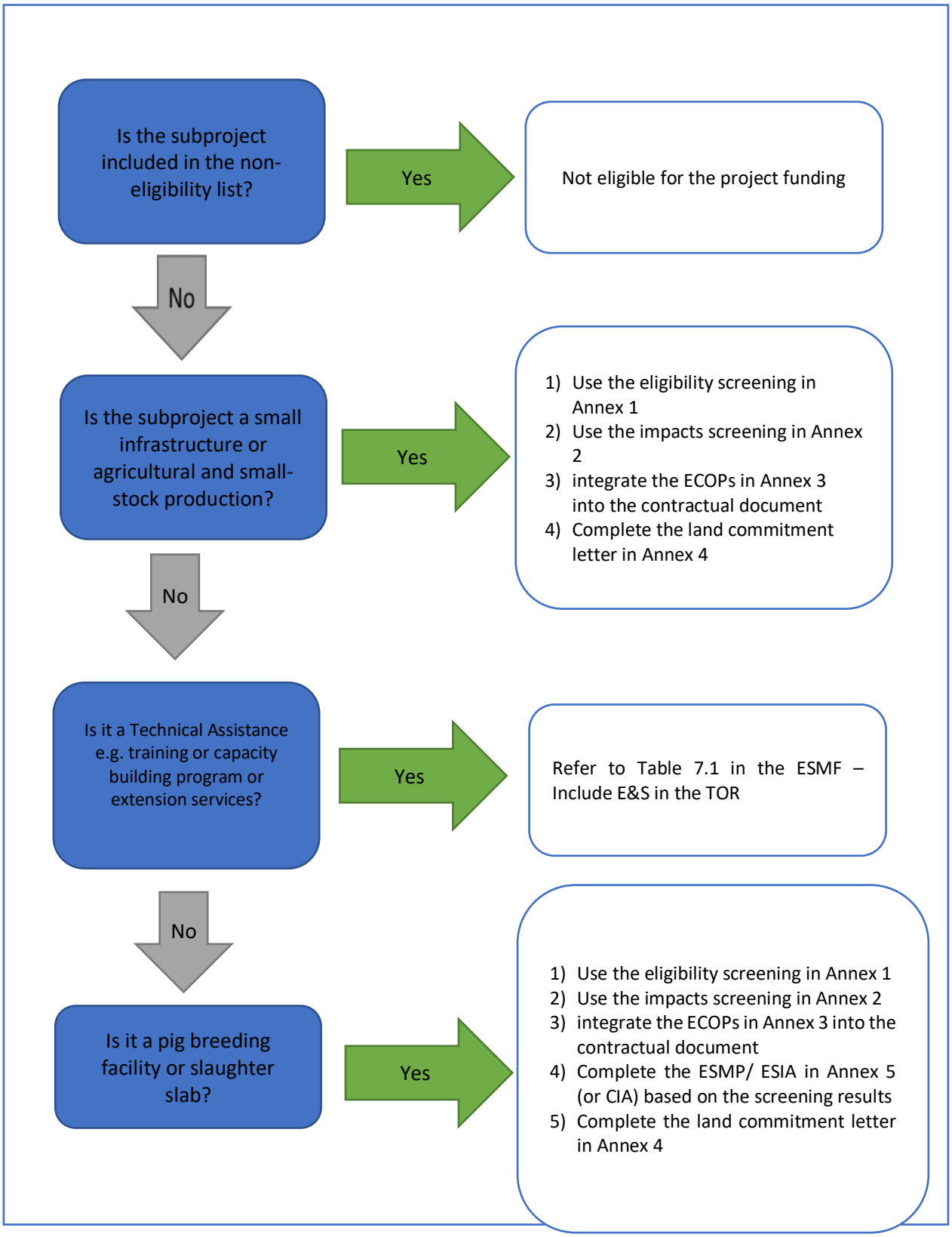


Figure 2: Procedure for implementing environmental and social risk management

7.3 Steps for implementing environmental and social risk management

- The following provides the steps that will be undertaken in the assessment of project activities. The screening of activities will take place either during the annual work plan or on an ad hoc basis as activities are defined by the Project Team/s. The screening process will follow the key steps in Figure 2:

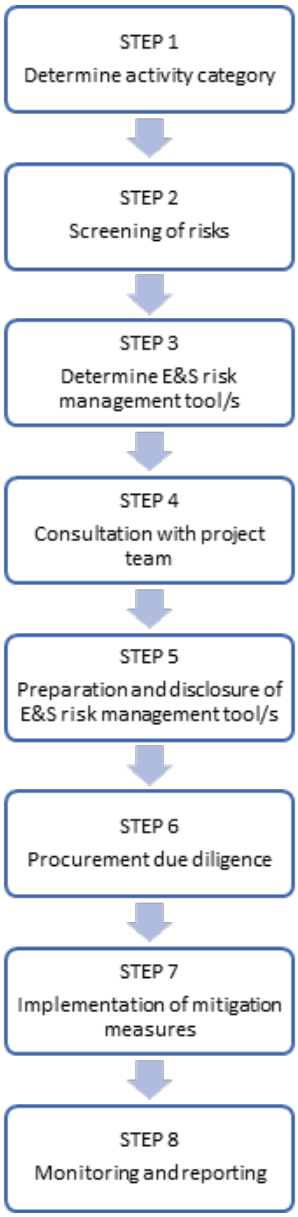


Figure 3. Key Activity Screening Steps

7.3.1 Step 1 –Screening for eligibility

- Step 1 is to verify that the subproject will not finance activities included in the non-eligibility list. The **eligibility screening form (in Annex 1)** will be completed by the provincial MAL officers and reviewed by

the MAL provincial ART coordinator before being reviewed by the Environmental and Social consultants to confirm eligibility. The purpose of this step is to exclude subprojects that may have adverse social or environmental impacts and risks.

Table 7.4 – Ineligible Activity List

The following type of activities shall not be eligible for financing under the Project:

- Activities of any type classifiable as "High" risk pursuant to the World Bank's Environment and Social Standard 1 (ESS1) of the Environment and Social Framework (ESF). The following activities are illustrative examples of "High" risk activities:

  - Activities that may cause long term, permanent and/or irreversible (e.g. loss of major natural habitat) adverse impacts;

  - Activities that have high probability of causing serious adverse effects to human health and/or the environment not related treatment of COVID-19 cases;

  - Activities that may have significant adverse social impacts and may give rise to significant social conflict;

  - Activities that may affect lands or rights of indigenous people or other vulnerable minorities;

  - Activities that may involve resettlement or land acquisition/use restriction or adverse impacts on cultural heritage;

  - Activities that are considered by the World Bank (a) to have potential to cause significant loss or degradation of critical natural habitats whether directly or indirectly or those that could adversely affect forest and forest health; (b) that could affect sites with archaeological, paleontological, historical, religious, or unique natural values; and (c) that will result in adverse impacts on involuntary taking of land, relocation of households, loss of assets or access to assets that leads to loss of income sources or other means of livelihoods, and interference with households' use of land and livelihoods; and

  - Use of goods and equipment as considered by the World Bank to meet the following conditions: (a) lands abandoned due to social tension/conflict, or the ownership of the land is disputed or cannot be ascertained; (b) to demolish or remove assets, unless the ownership of the assets can be ascertained, and the owners are consulted; (c) involving forced/conscripted labour, child labour (under the age of 18), or other harmful or exploitative forms of labour; (d) activities that would affect indigenous peoples, unless due consultation and broad support has been documented and confirmed prior to the commencement of the activities; and/or other paramilitary purposes.

- The exclusion of subproject activities that are considered as not being eligible for financing by the Project is based on the World Bank ESF and national legislation. The Bank would not finance any subprojects that may have irreversible adverse E&S Impacts. The Bank would not finance the subprojects that involve any involuntary resettlement of local people, purchase of asbestos, dynamites, destructive hunting, and other investments detrimental to the natural resources; and addictive substances such as tobacco,

brewery, etc. More details can be found in Annex 1.

7.3.2 Step 2 – Screening for Impacts

- Step 2 is to screen the Potential Environmental and Social Issues in Annex 2. The **impacts screening form** (in Annex 2) is essential as it helps sub-project proponents to identify the site-specific impacts and risks. The **impacts screening form** will determine what activity E&S risk management tool/s are required to be developed and/or followed (if any). For this purpose, the screening reports and determination of the E&S risk management tool/s will be reviewed by the E&S consultants (and the Bank team at least during the first-year implementation of the project).

7.3.3 Step 3 – Determine E&S Risk Management Tool/s

- The third step is to determine what specific E&S risk management tool/s are required or apply, if any, under the World Bank and national E&S risk management requirements. The subproject/activity screening process (Figure 1) will assist in determining the E&S risk management tool that need to be prepared or followed. The purpose of this step is to identify the mitigation measures or type of ESF instruments (or tools) under the World Bank ESF and national requirements proportionately to the scale and risks at the subproject level. This step is to prepare the E&S mitigation measures.

  - **For the impacts related to agriculture and smallstock production,** an ECOP in Annex 3.1 should be sufficient to address the low to moderate environmental and social impacts.
  - **For the impacts related to small infrastructure in general**, a small infrastructure-ECOP (in Annex 3.2) should be sufficient to address the site-specific and localizable environmental and social issues for both the design and construction phases. Furthermore, MAL will ensure that the ECOP and ESHS provisions are incorporated into the bidding and contract documents and subjected to close monitoring of the contractor performance, following the World Bank Procurement Framework.
  - **For the impacts related to feeder road or footpath,** a small infrastructure-ECOP (in Annex 3.2) should be sufficient to address the anticipated, localizable environmental and social issues. Environment and social risk screening, and construction design of the feeder road or footpath would be submitted to the Bank team for review. A site-specific Environmental and Social Management Plan (ESMP)[13] — equivalent to an ESIA according to the national environmental act of 1998—is not anticipated for the feeder road or footpath; however, the provincial MAL with support of the two E&S consultants will verify the screening results of the feeder road or footpath investment during the project implementation.
  - **For the impacts related to the construction and operations of pig breeding facility and slaughter slab, an** ESIA (which may be limited in scope based on the risks identified during E&S impact screening using the form in Annex 2) and an ESMP will likely be required subject to the prior-review by the E&S consultants and the Bank team. The design, **construction and operations of pig breeding facility and slaughter slab** will also be required to adhere to the World Bank Group environmental, health and safety (EHS) guidelines, and FAO guidelines: at http://www.fao.org/3/t0034e/T0034E01.htm. See also Annex 4 about the proposed TOR of ESMP/ ESIA and Annex 7 regarding an indicative diagram of a slaughter slab. The EDC director will also be

[13] *An ESMP*—equivalent to a limited ESIA—*is generally unexpected. If any ESMP is warranted, due attention will be given to address the issues of labor and working conditions (ESS2), resource efficiency and pollution prevention and management (ESS3), community health and safety (ESS4), biodiversity conservation and sustainable management of living natural resources (ESS6), and stakeholder engagement and information disclosure (ESS10).*

consulted, by MAL team, to verify the need for the ESMP/ ESIA. A large number of pig breeding (e.g., 200 sows) and slaughtering smallstock (i.e. poultries and pigs) can result in hygienic meat supply, wastewater and livestock waste spills can introduce enteric pathogens and excess nutrients that can runoff into surface waters or leach into groundwater resources, potentially causing contamination of groundwater resources. Therefore, national health and sanitation standards during the operation also need to be carefully observed, and the need for site-specific mitigation measures and operational management plans will be verified against the conclusion of subproject screening results. The ESMP/ ESIA, feasibility study, and engineering design of any pig breeding facility or **slaughter slab**[14] investment would be required for the prior-review by the Bank team.

- The provincial MAL with support of the two E&S consultants will also consider a possibility for cumulative impacts assessment (CIA) which might be relevant, given that a subproject might support large number of small producers in the same geographical area. The cumulative impacts refer to the effects of multiple actions or impacts on the environment. According to the World Bank ESF p. 18, "cumulative impacts can result from individually minor but collectively significant activities taking place over a period of time". The potential cumulative impacts will be determined as early as possible, ideally as part of subproject screening and scoping under Steps 2 and 3.

7.3.4 Step 4: Consultation with Project Team

If required, the screening outcomes will be discussed with the project/MAL team to identify ways to reduce or avoid any adverse impacts. Any adjustments to the design, categorization or E&S risk management tool/s can be refined following this process.

7.3.5 Step 5: Preparation and Disclosure of E&S Risk Management Tool/s

If required, the next step is to prepare the relevant E&S risk management tool/s, both for the national and the World Bank requirements, which may include site visits and data gathering, consultation, and public disclosure of the documents.

7.3.6 Step 6 – Procurement Due Diligence

Determine if procurement is required for the activity. If yes then ESHS provisions will be incorporated into bidding documents, in accordance with the new World Bank Procurement Framework. Under Step 7, MAL team, assisted by the two E&S Consultants, incorporates the ESHS provisions (based on the ECOP and/or ESMP) in the contractual procurement.

7.3.7 Step 7: Implementation of Mitigation Measures

The implementation of the E&S risk management tool/s and conditions of any environmental approvals will need to be implemented, monitored and enforced. Training of implementing staff may be needed to ensure that conditions of the E&S risk management tool/s are met. For contractors, monitoring and supervision will be needed to ensure that conditions of the E&S risk management tool/s are met.

[14] Pig and Poultry Slaughter Slabs. The project will support one pig slaughter slab and one poultry slaughter slab in each of the three project provinces. The slabs will be located in peri-urban areas with heavy concentrations of pigs and poultry and will contribute to completing the final link of the smallstock value chains from production to market. The slabs will be operated under hygienic slaughter conditions, using humane killing procedures, requiring off-the-ground slaughter and storage of carcasses. No cold chain will be included, and pigs and poultry will be delivered, slaughtered and collected for retail according to the same-day-slaughter-and-consumption rule. Live smallstock will be delivered by farmers or transporter middlemen and collected by the retailers ordering the slaughter. At the end of each working day, no carcass meat shall be left for overnight storage.

7.3.8 Step 8: Monitoring and Reporting

MAL team monitors contractor performance and report the results periodically.

Six-monthly monitoring reports will be prepared by the project/MAL team with the support of the two E&S consultants throughout the project cycle and submitted to the World Bank. The semi-annual environmental and social monitoring reports will be submitted to the World Bank will include: (i) the status of the implementation of mitigation measures in the ESMF and other instruments; and (ii) the findings of monitoring programs (iii) stakeholder engagement activities (iv) grievances log: information on any grievances received and how they were resolved. The semi-annual environmental and social monitoring report can be separated or an integrated part of the project's progress report. The WB team should periodically or semesterly review and monitor implementation of ESF requirements, for example, through implementation support mission. Monitoring, supervision and reporting should be conducted by MAL during the construction and operational phases to ensure that the potential impacts and risks are avoided, mitigated or addressed on time.

The semi-annual environmental and social monitoring report is aimed to gather information to determine the effectiveness of implemented mitigation and management measures and to ensure compliance with the approved E&S risk management tool/s. Monitoring methods must provide assurance that E&S risk management tool/s measures are undertaken effectively. Six-monthly reports will need to be prepared and provided to the WB. The semi-annual E&S monitoring reports to the Bank will include: (i) the status of the implementation of mitigation measures; and (ii) the findings of monitoring programs (iii) stakeholder engagement activities (iv) grievances log (v) any incidents/accidents with adverse impacts and the actions taken to address it and prevent reoccurrence.

7.4 Chance find Procedure[15]

- The following Chance find Procedure (CHF) would be applicable if artifacts or objects are exposed during the construction phase. The contractor and relevant stakeholders will follow the procedures described below:

  - Stop the construction activities in the area of the chance find.
  - Delineate the discovered site or area.
  - 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 nightguard or other relevant protection shall be present.
  - Notify the Community Extension Worker or Extension Officer, who in turn would notify the Provincial MAL (within 72 hours).
  - Contact the responsible 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 Ministry of Culture and tourism. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, including the aesthetic, historical, scientific or research, social and economic values.
  - 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

[15] *Adopted from the ESMF of RDP II*

- Implementation for the authority decision concerning the management of the finding shall be communicated in writing; and
- Construction work will resume only after authorization is given by the responsible authorities concerning heritage protection.

- During the project supervision, the two E&S Consultants shall monitor the above regulations relating to the treatment of any chance find encountered are observed. Relevant findings will be recorded and included in the progress reports for submitting to the World Bank for review.

- There is also the potential to encounter UXO during construction. While construction sites are expected to be swept for and cleared of UXOs, a chance finds procedure for handling the UXOs in accordance with national legislation will be the responsibility of the contractor. Ultimately, MAL or the project staff will be responsible for the supervision and monitoring of the contractor.

7.5 Land Commitment Guide

- 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 subproject. Drawing from RDP II, if the land is required as part of a subproject proposal, a **"Land Commitment Letter"** must be signed by the relevant parties (e.g. the public or clan that owns the land and the other representatives (clans and traditional leader of the community). If necessary, a duly completed Land Commitment Letter must accompany a community subproject proposal to be considered for approval. The Land Commitment Letter, used by RDP II in Annex 4, will be used for this project.

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

  - If the land is required for the identified community subproject then the land owner or leaders of the community, along with other community leaders as appropriate [4](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 subproject with the landowner or landowning clan (in the event the clan had not participated in the community meetings to prioritize the subproject) to share the rationale for the subproject and its proposed siting, and seek the donation of the necessary land by the owning clan;
  - At the same time, the land owner or owning clan would also be notified that their agreement to donating their land should be entirely voluntary;
  - If the land owner or 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 subproject proposal.

- At this stage, no land acquisition will be required for the project as the activities will most likely take place on land owned by smallholder farmers. The impact on land will be identified during the impacts screening process based on Annex 2 of this ESMF. To mitigate risks to land and from previous experience with RDP, land commitment agreements may be required where construction of infrastructure or other project activities are to be completed on community owned or privately owned land. A memorandum of understanding (MOU) or Land Commitment Letter would be already in place for one site where a training center is to be constructed on church-owned land.

8 Grievance Redress Mechanism

- The section describes the mechanism to receive and facilitate the resolution of affected peoples' concerns, complaints, and grievances about the project's performance, including concerning environmental and social impacts and issues.

- The Grievance Redress Mechanism (GRM) is to allow an avenue for project participants, community members, other interested parties of the project areas, and other stakeholders to comment on or express concern on matters relating to project implementation. It is intended to allow these various stakeholders to pass on important information to higher levels of project oversight and management in a neutral and, if necessary, anonymous fashion. This GRM is adopted from the Solomon Islands CAUSE Project, which functions well and demonstrates good practice by providing a range of feedback mechanisms to encourage open and safe communication and complaints. The CAUSE project's aide memoire in December 2020 shows that all 26 complaints were on record and resolved within the service standard of three months. The GRM comprises:

i. Feedback Mechanism and Feedback Form

ii. Grievance Redress Mechanism outlining the process for receiving and managing complaints and Complaints form

iii. Critical Incident

iv. Feedback, Complaints and Incidents Register and Reporting Procedures

- Definition of Feedback refers to comments or suggestions received from stakeholders that relate to the project, but are not raised as a complaint that requires specific action for that individual stakeholder, are classified as feedback. These comments or suggestions can be either positive or negative.

- Definition and Types of Grievances refers to a grievance arises from a complaint made which is usually negative towards the project and requires a specific response to the person or group who has made the complaint. Project staff workers are expected to handle three types of grievances. These include (i) grievances from community workers relating to project processes that might be resolved at the rudimentary level by providing accurate information that complainants are looking for and through clarification on project policies/rules; (ii) grievances brought by community workers who feel they cannot discuss with group leaders (GLs) or Contractors (e.g. payment issues) and (iii) complaints and issues regarding the project works and workers, which may be made by the general public.

8.1 Feedback Mechanism and Form

- Feedback from project participants, general community and other stakeholders should be encouraged as a way to ensure that the project is appropriate and can continuously improve throughout implementation. A variety of ways to provide feedback should be made available. These include availability of a specific feedback form included on the following page, which individuals can complete (or request to be completed on their behalf by project staff) and submitted to any staff member of the project. A feedback hotline mobile number should be maintained within the MAL Honiara Office to

receive anonymous feedback or complaints by phone call or text. This phone should remain locked in the office outside of work hours and is assigned to staff members to receive and document feedback received each day. A suggestion box at reception could also be a way for participants to make anonymous comments without making a formal complaint. These various feedback mechanisms should be made known to communities participating, especially the options for remotely submitting feedback (e.g. at any community meetings, information available as a flyer on how to give feedback or make complaints). MAL will prepare IEC materials on the GRM at the onset of project implementation, especially in subproject sites.

- Below is an example of the Feedback Form that will be used by the project.

Name of person giving feedback	
Gender and age of person giving feedback	
Location/s that feedback relates to (Province and local area)	
Name of person documenting feedback	
Date of receiving feedback	
Details of feedback	

Action Taken (if necessary)

8.2 Steps for Grievance Redress Mechanism

- The GRM process strives for a culture of openness to feedback and grievances, and for resolution of the majority of grievances at the initial engagement level with Provincial MAL officers and as necessary with the local and community level. Where this is not possible, is outlined the process for involving Provincial MAL or equivalent Provincial Government Authorities as required. This process is summarized in the figure below and each step is then outlined in the following paragraphs. All grievances must be recorded using the Form at the end of this section that outlines the nature of the grievance, actions taken and eventual resolution. Key information from these (date, location, what grievance related to, who was involved in resolution, time taken to resolve) must be recorded in a central database to allow monitoring and evaluation of the GRS. The project's GRM consists of the following steps:

8.2.1 Step 1. Resolution by Provincial MAL Extension Officer

- Provincial MAL Extension Officers (or equivalent) are normally the first layer of engagement between the project and project participants (community workers). Issues raised at this level may include queries and complaints by groups who have applied for work and have not as yet been selected, complaints relating to pay or to working conditions. All grievances entering the process at this level will be recorded and tracked with project grievance forms. Specific FAQs, brochures and posters should be developed and distributed to the public to reduce the time taken to address grievances relating to selection, equity and applications. As most contracts for community works are short it is necessary that grievances related to community workers should be immediately addressed with a view to reaching resolution within one working week. All other grievances including those raised by the general public should be addressed within two working weeks and should include advice of what further steps can be taken in cases where the complainant is not satisfied with the response. It is expected that most complaints should be addressed at this first step, however if a resolution satisfactory to the complainant/s is not at this step, the complaint should progress to Step 2.

8.2.2 Step 2. Involvement of Provincial MAL Manager

- Provincial MAL Manager (or equivalent) will deal with: grievances not resolved by the Provincial MAL Extension Officer (or equivalent field staff) in the required time; with grievances with which the complainants are not satisfied with the actions taken by the Provincial MAL Extension Officer; complaints and grievances brought by contractors of MAL sub-projects and any allegations of corruption. For serious cases, the PROVINCIAL MAL MANAGER shall constitute a panel of investigators which shall conduct fact-finding and recommend sanctions or any further action as needed. PROVINCIAL MAL MANAGERs should

have taken action on grievances brought to them in at least two working weeks having investigated the matter and contacted the complainants as to their recommendations and actions. All complainants of grievances that cannot be resolved within two working weeks should be promptly advised that their complaint has been forwarded to either the office of the Permanent Secretary for MAL. When referring issues to these representatives, the PROVINCIAL MAL MANAGERs must include a written brief accompanied by all documentation including the updated project grievance forms.

8.2.3 Step 3. Referral to National Implementing Agency

- Serious issues that cannot be resolved by the Provincial MAL Manager (or equivalent) should be promptly referred to either the office of the Permanent Secretary for MAL. The general public should be aware that they have the right to bring serious allegations and issues relating to project design directly to either of these offices. Unless otherwise advised PROVINCIAL MAL MANAGERs will continue to provide executive services relating to the resolution of grievances referred to the offices of the of the Permanent Secretary for MAL. These services will include communications with the complainants and updating of project grievance forms.

- It is realistic to assume that with the provision by the PROVINCIAL MAL MANAGERs of the required executive services, responses to most grievances referred to the office of the Permanent Secretary for MAL should be completed in a maximum of two weeks. The World Bank office in Honiara should be a last resort to become involved in attempts to address grievances not resolved at the national implementing agency. Below is an example of Grievance Redress Form.

BASIC INFORMATION

Name of Complainant: ……..	Complainant – category
Date of Complaint: ……	☐ Community worker
Contact Phone: ……	☐ Group leader
Location of Ward: ……..	☐ Contractor
Contact Address: ……	☐ General public
……	☐ NGO
Ethnic Background: ……..	☐ Parliamentarian
Gender: ……..	☐ Other (please specify)

Where/How was the complaint received:

In person Project Help Desk Referral from Community/ISDT Consultant

Community Leader Project Event Written Telephone

On-site: _____ (write location)

DETAILS OF COMPLAINT/GRIEVANCE:

……

……
……
……
……
……
……
……

COMPLAINTS AGAINST

☐ Group leader ☐ Contractor ☐ Fellow worker	☐ Works Coordinator ☐ Supervisors ☐ Provincial MAL Extension Officer	☐ MAL	☐ Project processes ☐ Project design ☐

TYPE of COMPLAINT

A. Work Related	**B. Project Processes**	**C. Project Design**	**D. Corruption related**
☐ Payment ☐ Type of work ☐ Problem with leader ☐ Conflict with co-worker ☐ Other	☐ Registration ☐ Screening & endorsement ☐ Targeting & selection ☐ Training	☐ Project goals ☐ Community needs ☐	☐

Signed by Complainant: ……

LEVEL 1 (Community Liaison Officer)	
Name of Project Staff:	Date of Action:
Details of Level 1 response/resolution (including persons involved)	
Result: Resolved Unresolved and Referred to Level 2	
Comments/reaction from complainant: Date:	

Result: Resolved Unresolved and Referred to Level 2
Comments/reaction from complainant: Date: .....

LEVEL 3 (Project Mgr.)	
Name of Project Staff:	Date of Action:
Result: Resolved Unresolved and Referred to a Higher Authority?	
Details of Level 3 response/resolution (including persons involved)	
Referred to: (City Clerk; MAL PS; PSC; WB)	Date feedback was provided to complainant: .....
Comments/reaction from complainant:	
Final Status: ..... Signed:	

8.3 Record or Register of Feedback and Complaints

- A register (example below) should be kept in a format that it can be easily analyzed such as Microsoft Excel or Microsoft Access database. Suggested classifications for the database are included in the below form.

Complaint No.	Date of Complaint	Name of Complainant	PIU	Details of Complaints	Name of any other persons involved in trying to solve the problem (e.g. community leader)	Action Planned and Taken to settle the problem	Was problem solved? (Yes/No)	If no, when was problem referred to next level?

Type A. Feedback B. Grievance/Complaint **Method of Making Complaint** 1.1 Via Group/Contractor Complaints Register 1.2 In person to Project Staff 1.3 Telephone 1.4 Written **Person Making Complaint** 2.1 Community worker, 2.2. Group leader or contractor, 2.3. Community member, 2.4. General public, 2.5. NGO, 2.6. (please specify) **Complaints Against:** 3.1 Group leader / contractor 3.2 Fellow workers 3.3 Works supervisors 3.4 Provincial MAL Extension Officers 3.5 Provincial MAL Managers 3.6 MAL	**Type of Complaint** **4. About work:** 4.1 Payment, 4.2 Type of work 4.3 other problem with group leader/contractor, 4.4 conflict with fellow workers 4.5 Working conditions 4.6 Other **5. Project Processes:** 5.1 Registration, 5.2 screening and endorsement 5.3 Targeting and Selection 5.4 Training 5.5 other **6. Project Design** 6.1 project goals 6.2 community needs **7. Corruption Related**

- Classification of Feedback/Complaints for RECORD System

Complaint Summary Form	Remark
Complaint Number: ……	
Date of complaint :……..	
Method of Making Complaint:……..	
Stakeholder Making Complaint:……	
Complaint Made Against:……	
Type of Complaint:…….	
Was Problem Solved? Yes / No	
At What Step was Problem Solved? 1 2 3 4 5	
Number of Working Days to Solve Problem:……..	

9 Institutions, Responsibilities and Capacity Building

10 Public Consultation and Disclosure Summary

- Following the World Bank policy and the requirements of ESS10, the ESMF, ESCP, LMP, and SEP have been disclosed at https://solomons.gov.sb/ministry-of-agriculture-and-livestock/ on 14 December 2020.

- Based on the Project's Stakeholder Engagement Plan (SEP), high-level consultation with relevant ministries of the Solomon Island Government. the consultation was on 22 January 2021 from 9:00 am to 12.00pm at its Livestock Building conference room. The aim of the consultation was to collate feedback to improve the qualification of the application of the ESF instruments namely ESMF, ESCP, LMP, and SEP as an integral part of the environmental and social due diligence process. The consultative feedback such as application of the national legislation and screening potential environmental and social risks and impacts were integrated in the relevant ESF instruments. Minutes of the consultation can be found in Annex 3 of the LMP.

- Community consultation sessions on the project design have been conducted by MAL in the 3 project provinces. The minutes or a summary of these community consultations can be shared with the World Bank team once it is available.

- Given government measures to avoid the spread of Covid-19, the usual face-to-face consultations may not be possible. During the project preparation and implementation, MAL team has an alternative plan for the virtual consultations, which will be used where appropriate. As agreed with the World Bank team, the consultation process will follow a 3-way approach including online, phone calls/emails and commune office. MAL team understood that 'the stakeholder consultations and implementation activities may increase the risk of COVID-19 transmission, although all non-essential travel will be avoided. A COVID-19 Safety Protocol will be developed within 30 days of project effectiveness. In the interim MAL/the PMU will follow national legislation and relevant WHO guidelines.'

10.1 Institutional Arrangements and Responsibilities

- This section describes the institutional arrangements to implement the ESMF, from the screening to review and clearance of subprojects.

- The Ministry of Agriculture and Land (MAL) will be the implementing agency. MAL has some experiences in working with the Bank's operations and operationalizing safeguards policies through their role in implementing Component 2 under the Rural Development Program II (RDP II, P149282). However, the project will apply ESF policy and will require more capacity building to support MAL to effectively implement a Bank-funded project on its own. The project presents additional challenges, including adjusting to the ESF requirements. The project will make use of short term experts (national and international) to enhance MAL's implementation capacity and to provide specific technical inputs and training sessions under component 2 to improve the knowledge and skills of existing extension officers and its target beneficiaries.

- The transition to the ESF will require MAL and project staff at all levels, including contractors and suppliers, to develop a broad understanding of the ESF approach including the proportionality concept and adaptive management of E&S risks. It will also require development of specific capacity in relation to each relevant environmental and social standard (ESS). As shown in Tables 10.1 and 10.3, the project has allocated resource for two local safeguards consultants (e.g., one environmental safeguards specialist and one social safeguards specialist) to assist MAL with this process.

- In overall, the ESMF implementation will follow the project implementation arrangements. The responsibilities of key stakeholders for ESMF implementation are summarized in Table 10.1.

Table 10.1: ESMF implementation responsibilities

No.	Who	Responsibilities
1.	MAL/PMU	• Recruit a full-time local Environmental Risk Management Consultant and a full-time local Social Risk Management Consultant. If two full-time local Environmental and Social Risk Management Consultants are not able to be recruited, one full time local Environmental and Social Consultant and one international part-time Environmental and Social Consultant may be recruited instead. The two E&S consultants will help implement, monitor, and report the ESMF and other E&S instruments such as the ESCP, SEP, and LMP. • Retain or newly assign two E&S focal points, who will work with and receive hands-on support from the E&S consultants • coordinate closely with the provincial MAL and relevant authorities to ensure the participation of the community during project preparation and implementation. • Monitor and report the ESMF implementation to the World Bank and Government. With assistance from the E&S consultants, MAL will ensure: • Environmental documents are prepared, reviewed, and disclosed to meet project requirements. • Appropriate mitigation measures are adequately incorporated into bidding documents and contracts. • Follow up with E&S issues raised by Design and Supervision Contractor/Consultant during the implementation phase. • Report to ECD or other relevant authorities on project environmental issues when required.
2.	Environmental, Social and Health and Safety and Community Engagement Consultants (E&S Consultants)	• Review the environmental and social screening reports received from MAL Officers • Determine the subproject category and the required E&S instruments (e.g. ECOP) • Mentor MAL Officers on the environmental and social screening checklist and reporting procedure. • Manage the overall implementation of the project's ESMF and other instruments • Report to all project management on progress, coordination, activities management plan, status of activities, human resource deployment plan etc. to ensure appropriate coordination among the projects as well as tasks within each project. • Attend World Bank missions, field trips, meetings etc. as required. • Prepare environmental risk assessments and management instruments, collecting data and conducting field work as required, for consistency with World Bank policy and national legislation. • Ensure project-level citizen and stakeholder engagement and disclosure processes to ensure World Bank policy and community expectations are met. • Assist with implementing the GRM. Assist with resolving grievances at all levels • Input to monthly and six-monthly monitoring reports on the environmental, social, health and safety (ESHS) performance of the Project. • Provide ongoing training, awareness raising on the ESMF and other instruments to the project workers • Review and contribute to TOR for technical assistance and consultants or specialists engaged by Projects ensuring the E&S risk management instruments and World Bank ESF are adequately covered, as necessary. • Manage the oversight of project consultants, in the case that specialist consultants are required, and contractors including Civil Works Contractors including regular monitoring and assurance activities. • Provide support and training for Civil Works Contractors to prepare Demolished building waste and construction waste management and health and safety plans.

No.	Who	Responsibilities
		Review and approve Contractor's waste management and health and safety plans. • Support MAL to manage any environmental risks and/or incidents on the Project. • Conduct other related activities as required. See also the sample TOR in Annex 5.
3.	Contractors	• Comply with the approved ECOPs and ESHS specification in bidding and contractual documentation; • Get all permissions for construction (traffic control and diversion, excavation, labor safety, etc.) following the Based on the approved ECOPs and ESHS specification;
4.	MAL provincial ART coordinator/ Provincial Project Management Unit	• Assign Provincial MAL Officers as the provincial E&S focal points • Coordinate with MAL/contractor to provide sufficient information about the project to affected/benefited communities;Take part in promoting community participation in monitoring the project's environmental and social performance and promoting community participation
5.	PO committee members Community Resource Persons or lead farmers	• Participate in the E&S training • Participate in E&S screening exercises • Comply with the relevant and applicable ECOPs and ESHS specifications •
6.	ECD[16]	• Review the subproject screening reports/development proposals submitted by MAL If required to assess.
7.	Provincial MAL Officers	• Be responsible for preparing the environmental and social screening reports
8.	Design and Supervision Contractor or MAL staff (e.g., from the Planning Department)	• Support MAL to integrate the environmental and social risks and mitigation measures into field investigations, feasibility study, preliminary and detailed engineering design for productive and small infrastructure • Support MAL to integrate the environmental and social mitigation measures such as ECOPs and approved ESHS specifications into the bid and contractual documents

10.2 Capacity Building and Training Requirements

- The current institutional capacity of MAL for implementing and monitoring the ESMF is considered to be weak, mainly due to lack of staff in the environmental and social risk management skills and inadequate resources to implement and monitor the envisaged environmental and social requirements of the project activities. MAL has prior experience in the implementation of World Bank-financed RDP and RDP II projects and the old safeguards. The staff at MAL who have limited experience in safeguard management of these projects may not be available for the Project. Therefore, the Project will require the services of E&S consultants, who will assist the project staff in familiarizing with ESMF requirements and provide on-the-job training for the project staff before they can manage the project themselves. The consultants will also liaise with the relevant agencies such as the Ministry of Environment; provide support to the communities through information dissemination, training, workshops, and identify institutional needs. The sample TOR for the E&S Consultant can be found in Annex 12.2F.

[16] *MAL to verify with ECD director since the E&S risks are not significant.*

- During the implementation of the ART project, ESF training and technical assistance will be provided both for MAL and Province-based staff. During the first 3 years, MAL will conduct at least 2 ESF training workshops (e.g., one on environment and one on social) per year during the first 3 years regarding the ESMF and other E&S instruments and the needs for preparation of E&S risk management documents, including those related to subproject screening reports, ECOP and ESHS for the bidding and contract documents. The World Bank Environmental and Social Specialists will participate in these training workshops as much as possible. All training workshops must be COVID-19 safe. Priority for training contents should include, but not limited to, the followings:

    - General training on the ESCP and ESMF including process and guidelines for preparation, implementation, and supervision of subproject documents (e.g., subproject screening reports, ECOP and ESHS);
    - General training on the LMP and SEP including process and guidelines
    - Specific training on the application of GRM that could be effective in responding to local complaints;
    - Specific training on supervision and monitoring of contractor performance, including forms and reporting process including basic knowledge on health, safety, and good construction practices for reducing potential impacts on the local environment and local peoples, including communication and GRM procedures and other social issues related to Covid 19, HIV/AIDs and other communicable diseases, etc.; and
    - Specific training on pest management plan (PMP) especially on safe use and disposal of pesticides, herbicides, and other toxic chemicals in agriculture and livestock production.

- For precautionary risk management approach, outreach, training and capacity building for participating communities will include safe use and handling of all agrochemicals, including pesticides, chemical fertilizers and soil amendments, agricultural discharge to surface water through runoff of pesticides, chemical fertilizers and manure. Specific target groups for the prioritized training courses are proposed in Table 9.2 and can be updated before and during the project implementation.

Table 10.2: Specific Target Groups for Key Training

No	Contents of Training	Target Groups for Training
1.	ESMF, SEP, LMP, ESCP, and other E&S instruments for the subproject level	• MAL's and provincial E&S focal points • Other project staff who are interested in the E&S instruments
2.	GRM that could be effective in responding to local complaints	• MAL E&S focal points • Provincial MAL Officers (e.g. extension officers) • Community Resource Persons (CRPs), • Participating farmers or PO members. • Young Professionals from SNRAS, SINU
3.	Environmental and social risk management monitoring and reporting skills	• Design and Supervision Consultant/Contractor; • MAL's and provincial E&S focal points
4.	ECOP compliance and environmental health and occupational safety measures, prevention of communicable diseases.	• Contractor • Design and Supervision Consultant/Contractor; • Community Resource Persons (CRPs) • MAL's and provincial E&S focal points
5.	PMP for the Safe use of pesticides and agro-chemicals	• MAL E&S focal points • Provincial MAL Officers

		• Community Resource Persons (CRPs), • Participating farmers or PO members. • Young Professionals from SNRAS, SINU
6.	Land Commitment Procedure	• MAL provincial E&S focal points
7.	Others: The E&S risk management and GRM skills shall be integrated into the training materials for the CRPs who will provide extension services at the doorstep of farmers.	• Community Resource Persons (CRPs), • Participating farmers or PO members. • Young Professionals from SNRAS, SINU

10.3 Budget

- Many of the costs of implementing the Environmental and Social Management Framework (ESMF) will be integrated into project budget lines, for example, for covering (i) salaries and non-salary costs of E&S consultants and E&S focal points; and (ii) costs of E&S Risk Management-related training. See also the costs in the SEP. The project team will review this plan every six months to determine if any changes are required. Table 9.3 presents an indicative budget for implementing the ESMF and other E&S instruments.

Table 10.3: Estimated Implementation Costs

Stakeholder Engagement Activities	Unit	Unit Cost (SBD)	Years	Total Cost (USD)	Remarks
Environment and social consultants salaries (2@SBD21,000[17] per month)	2	$31,500	5	$240,725	2 E&S consultants
Travel expense for staff/E&S consultants (cost per year)	1	$27,000	5	$135,000	2 E&S consultants, E&S focal points and other E&S travel
Project Launch Meetings (in 3 provinces)	3	$8,125	1	$24,375	
Community Meetings/Sensitization (in 16 wards, quarterly)	64	$625	5	$200,000	
Provincial Meetings/Sensitization (in 3 provinces, quarterly)	12	$2,500	5	$150,000	
Communications materials and Grievance Redress Activities which include: - GRM pamphlets, posters, PR kits-including design) - GRM guidebook/manual - Suggestion boxes (in each province and ward) - GRM MIS/Database - Training of GRM committees at the provincial level - Internal GRM Training for the project staff and contractor staff	1	$46,875	1	$46,875	
Training workshops on environmental/social issues for contractor/consultants (Honiara and 3 provinces)	4	$1,875	3	$22,500	2 national E&S focal points assigned by MAL 3 provincial E&S focal points (e.g. extension officers) assigned by provincial MAL
Citizen/PAP perception surveys	12	$4,000	2	$96,000	4 communities /province at MTR and project end
Total:				**$915,475**	

[17] *USD1.00 = SBD8.00*

Annexes

Annex 1: Screening for Eligibility[18]

Provincial MAL Officer will do a screening of all subprojects to determine eligibility. The ELIGIBILITY SCREENING is conducted to determine if a subproject is eligible for funding under the project.

Agriculture and Rural Transformation Project

ELIGIBILITY SCREENING FORM

Filled in by Provincial MAL Officer and verified by provincial MAL coordinator with the support of Environment and Social Consultant

Sub-project name:

Location of Village and Province:

When a subproject is proposed, answer the questions below:

No.	Questions	Yes	No	Comments/Notes
1.	*Will the subproject activities…..?*			
2.	Involve political activities?			
3.	Involve religious activities such as building, upgrading or maintenance of a church?			
4.	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			
5.	Involve military, security services or police?			
6.	Acquire forest land**, or convert existing forest land to agricultural land?			
7.	Acquire land in legally protected areas such as Conservation Area, wildlife management area or National Parks?			
8.	Involve any relocation and/or demolition of any permanent houses or business?			
9.	Cut down food trees, fruit trees of small island communities for timber as community contribution			
10.	Acquire land in Protected areas or exclusion area defined by the Environmental Act 1998 *			
11.	Lead to the spreading of invasive weeds or involve alien species or any significant risks to biodiversity, animal welfare, land conversion or legally protected natural resources as justified in			

[18] *Annexes 1 and 2 are adopted from RDP II*

	the IFC Good Practice Note: Improving Animal Welfare in Livestock Operations (2014)[19]?			
12.	Acquire or cause irreversible changes to seasonally inundated land, e.g. swamps, mangroves forest?			
13.	Cause damage or removal of known existing cultural heritages including sites having archeological (prehistoric), paleontological, historical, religious, cultural and unique natural value, temple, ancient graves, sacred trees, or any other objects of spiritual value to the local communities?			
14.	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.			
15.	Involve new roads, road rehabilitation, road surfacing, or track upgrading, new irrigation system, of any kind inside natural habitats and existing or proposed protected areas?			
16.	Purchase of firearms; dynamites, destructive hunting, and other investments detrimental to the environment.			
17.	Purchase of banned pesticides, insecticides, herbicides and other unbanned pesticides, unbanned insecticides and unbanned herbicides and dangerous chemicals exceeding the amount required to treat the infected area efficiently.			
18.	Cause unsustainable exploitation of natural resources or labor and working conditions involving harmful, exploitative, involuntary or compulsory forms of labor, forced labor , child labor , or significant occupational health and safety issues.			
19.	use or induce the use of hazardous materials (including asbestos) or any banned chemicals.			
20.	Require the acquisition of privately owned land including involuntary taking of land, relocation of households, loss of assets or access to assets that leads to loss of income sources or other means of livelihoods, and interference with households' use of land and livelihoods.			
21.	Others:			

[19]Accessible at https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_animalwelfare_2014.

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

Conclusion:

☐ A: ALL of the answers are "No"; thus the subproject is ELIGIBLE

☐ B: At least one answer was "Yes", but details in subproject proposals such as the type of investments, the locations etc. were modified to make all the answers become "No". Therefore, the modified subproject is ELIGIBLE

☐ C: At least one answer is "Yes", the subproject proposal cannot be modified, the subproject is INELIGIBLE.

NEXT STEP:

☐ The subproject is eligible, proceed to a next Step
☐ The subproject is ineligible, remove the subproject

Prepared by: Check/verified by
(Name, position)

Date: Date:

Annex 2: Screening for Environmental and Social Impact and Risk

Instructions:

In addition to the Non-Eligible Screening in Annex 1, Annex 2 is used to screen for potential adverse environmental and social impacts and risks that may occur during the construction and/or operations of the subproject. The screening should be done along with on-site observation or assessment for the potential impacts and risks, it is important to recognise the objects potentially affected and the sources of impacts and risks. The information recorded in the below IMPACTS SCREENING FORM is essential as it helps the subproject proponent (e.g. provincial MAL) to recognise the impacts of the subproject activities so as relevant mitigation measures can be selected for the subproject activities. 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 type of ESF instruments (e.g. ECOP or ESMP/Limited ESIA) as described in Chapter 7.

+ Answer all questions for each subproject (Y/N) in the cell.
+ If one or more answers is Y, then fill NE (Not Eligible in the last row and exclude the subprojects.
+ If all answers are "N", then subproject is eligible for being financed under the Project.

*This checklist should be filled in and filed at MAL Office, together with other E&S documents. Photos of on-site screening or field investigation will be attached.

IMPACTS SCREENING FORM

Subproject name and a brief description: …….
Location of Village and Province: …….
Date: …….. **Screened by: ……..**

Filled in by the provincial MAL officer after a site visit or field investigation: ……
checked and verified by the provincial MAL coordinator / Environmental and Social Consultant: ……..

IMPACTS SCREENING FORM

Filled in by Provincial MAL Officer: …….
Verified the Provincial MAL Coordinator: ……

Sub-project name and a brief description:

Location of Village and Province:

Provincial MAL Officer should fill in this form during or after visiting the subproject site.

Subject	Screening Questions	Yes	No	Note/Comment (column to be

				completed with additional information where the response to a screening question is yes)
CONSTRUCTION PHASE				
	Will the subproject:			**(guidance are given below)**
1. Vegetation cover, trees, insects, animal	Remove vegetation cover, cut down trees for timber or site clearance?			*Specify the number and the type of trees to be cut down*
	Affect cropland with waste and wastewater?			*Assess if waste and wastewater generated during construction affect existing crops*
	Disturb wildlife, insects such as snakes?			
2. natural resources	Be located near forest or least disturbed /nature reserve area?			*Estimate the distance*
3. Landscape	Cause significant changes to, or negatively affect the landscape of the area?			*Describe the nature of change, e.g. from green site to concrete/ wooden structures, dumps created in green area,*
4.Solid waste	Generate solid waste such as excavated soil, unused materials			*List the type (and quantity if possible) of solid waste potentially generated*
5. Hazardous wastes	Generate hazardous waste such as batteries, unused paints, oil, lubricant etc.			*List the type (and quantity if possible) of solid waste potentially generated*
6.Wastewater	Generate wastewater from the site?			*List the types of activities (e.g.*
	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 demolished building waste, 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 a coastal area that may lead to the risk of salinity intrusion			*estimate the nature of water use by the project*
	b. Extract or use a 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			*List the activities/circumstance that Can cause Social disturbance (e.g. Disrupt the pedestrian traffic or the operation of local water supply system etc.*
	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 the community			*List the activities/circumstance that may cause safety risks to local community*
15. Public health	Cause concerns on public health/ sanitation /hygiene in the 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, graveyard, 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 an application for funding
20. Land acquisition	Does the subproject involve voluntary land acquisition			Government land. Work with the provincial MAL and E&S consultants to acquire land. Private land. Must be voluntary land donation or private land lease only. Involuntary land acquisition is prohibited. Exclude land with private assets or that needs significant clearance.
Others:				Specify
OPERATION PHASE				
	Will the subproject:			
1. Water/soil pollution	Generate wastewater from the site? e.g. slaughterhouse wastewater, fertilizer runoff etc.			
2. Waste	Generate solid waste e.g. slaughterhouse waste			
3. Nuisance noise, odour	Result in noise or odour impacts to nearby receivers (houses, schools, community facilities etc.)			
4. unhygienic conditions, public health risks				
5. Worker's health & safety	Require training and health and safety management for workers to allow for safe operation			*List the activities/circumstance that may create safety risks to workers*
6. visual impacts				
7. Conflict with downstream water users?				*List the activities/circumstance that may create conflict with downstream water users*
8. Others				Specify

Conclusion: Based on the above screening preparation of the below ESF documents/instruments is recommended:

- ECOP (in the ESMF) (Solomon Islands & WB)
- ESIA/ESMP (Solomon Islands/WB)
- Full EIA incorporating ESMP (Solomon Islands)
- Waste or Wastewater Management Plan
- Land Commitment Letter (in the ESMF)

Annex 3

Annex 3.1. Environmental Code of Practice for Agricultural and Smallstock Production

With the potential impacts and risks identified in step #2, a set of mitigation measures can be determined to address these potential impacts, and furthermore, make the project environmentally and socially sound. The potential impacts and risks are anticipated to be localizable, predictable, and manageable through the implementation the Environmental code of practice (ECOP) for Agricultural and Livestock Production according to the integrated pest management plan (PMP) recommended by the national regulations in Appendix 1 and the World Bank Group Environmental, Health, and Safety (EHS) Guidelines (2016)[20] for Annual Crop Production, Livestock Production and Processing. The ECOP provides the guidance for the environmental and social risk management during the implementation of the Project. The ECOP should be read in conjunction with the following Project documents:

- Environmental and Social Management Framework (ESMF)
- Labour Management Procedure (LMP)
- Stakeholder Engagement Plan (SEP)
- Project Operational Manual (POM)

It is very important to be aware that the stakeholders responsible for implementing the mitigation measures. MAL with the support of E&S consultants will ensure the Environmental Code of Practices are integrated into the bidding/contractual agreements, if any.

Monitoring and Reporting

Six-monthly reports will be prepared by the project/MAL team with the support of the E&S consultants. throughout the project and submitted to the World Bank. The semi-annual environmental and social monitoring reports to the World Bank will include: (i) the status of the implementation of mitigation measures, ESMF, and other instruments; and (ii) the findings of monitoring programs (iii) stakeholder

[20] accessible at https://www.ifc.org/wps/wcm/connect/10d733d9-6d68-4139-bf39-2a45219310a0/Annual_Crop_EHS+Guidelines_2ndConsultation_Jan2016.pdf?MOD=AJPERES&CVID=laufUPW

engagement activities (iv) grievances log: information on any grievances received and how they were resolved.

ECOP #1. Agriculture and Livestock Production

Type	Potential Impacts and Risks	Typical activities that cause potential impacts/risks	Codes of Practices or Mitigation Measures	Responsible
Agricultural production and processing	• Impact[21] on health and safety of project-affected communities, particularly regarding the safe use and handling of pesticides and chemical fertilizers	• Use and handling of pesticides and chemical fertilizers • Waste awareness-training and waste management plan.	• Prohibit the introduction of any invasive species as outlined in the National Agricultural Sector Strategy. • Use sustainable agricultural practices/approaches/technologies (e.g., Agroforestry Practices, Polycultures and Crop rotation, Integrated Pest Management (encouraging the predators of crop-eating pest insects such as birds and bats), etc.) • Reduce top-soil losses from erosion and the reduction in soil fertility (Cover Crops and Mulches (Establishing leguminous ground cover and applying plant residues), Grass Barriers (planting grass in strips along the contour lines), etc.) • Induce conservation and efficient use of water. • Reduce misuse of agrochemicals, contributing to a reduction of toxic substances in soil and water. • Reduce the usage of pesticides and promote integrated pest management plan measures recommended by the national regulations. • Reduce, recycle and reuse the agricultural waste (natural, animal, plant waste). • Strengthen environmental protection, food safety through strengthening the role of predators and reducing environmental pollution (water, land, air);	• Contractor • Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
	• Environmental pollution from biodegradable and non-biodegradable solid waste from agriculture activities	• Use of natural and other non-biodegradable materials for agricultural activities.		
	• Low environmental impact of point source pollution from the agricultural processing industry results from the usage of chemicals and discharge of wastes.	• Usage of water for general cleaning purposes. • Discharge of waste, wastewater, and used chemicals for processing.		

[21] The project will not finance these hazardous materials; however, transformation of land ownership may potentially introduce new famers to the materials.

Smallstock production and processing	• Water contamination from intensified smallstock production, inappropriate use of agricultural fertilizers and chemicals	• Discharge of waste and wastewater	• Fence off water bodies from gazing animals. • Increase the carbon to nitrogen ratio in feeds to reduce methane and nitrous oxide production • Promote efficient storage, handling and use of feed by maintaining records of feed purchases and livestock feed use. • Use covered or protected feeders to prevent feed from exposure to rain and wind. • Consider mixing of waste feed with other recyclable materials destined for use as fertilizer, or else consider incineration or land disposal options • Grind feed to increase utilization efficiency by the animals, allowing the use of less feed and thereby reducing the amount of manure generated (as well as increasing the production efficiency) • Ensure production and manure storage facilities are constructed to prevent urine and manure contamination of surface water and groundwater (e.g. use concrete floors, collect liquid effluent from pens, and use roof gutters on buildings to collect and divert clean stormwater) • Control the temperature, humidity, and other environmental factors of manure storage to reduce methane and nitrous oxide emissions. This may involve use of closed storage tanks or maintaining the integrity of the crust on open manure storage ponds/lagoons • Keep waste as dry as possible by scraping wastes instead of, or besides, to flushing with water to remove waste; • Locate manure stacks and urine away from the household area, water bodies, floodplains, wellhead fields; or other sensitive habitats • Regularly collect and store manure for composting and later application to fields to reduce	• Contractor • Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
	• Environmental pollution from biodegradable and non-biodegradable solid waste from agriculture activities	• Use of natural and other non-biodegradable materials for smallstock activities.		
	• A substantial environmental impact of point source pollution and the smallstock processing industry results from the discharge of wastewater. Most processes in smallstock slaughtering require the use of water and warm water.	• Discharge of waste and wastewater • Usage of water and hot water for general cleaning purposes.		

			noxious odour and to limit the spread of pathogens. • Conduct manure spread only as part of a well-planned strategy that considers potential risks to health and the environment due to the presence of chemical and biological agents as well as nutrient balance in an agricultural setting. Ensure that manure is applied to agricultural land only during periods that are appropriate for its use as plant nutrient (generally just before the start of the growing season) • Regular cleaning of livestock sheds and feeding pens. • Reduce the amount of water used during cleaning (e.g. by using high-pressure, low-flow nozzles) • Improve the productivity and efficiency of livestock production (thus lowering the methane emissions per unit of livestock) through improvements in nutrition and genetics, use mechanical controls (e.g. traps, barriers, light, and sound) to kill, relocate, or repel pests • Consider covering manure piles with geotextiles (which allow water to enter the pile and maintain composting activity) to reduce fly populations • Use predators to control pests. Protect natural enemies of pests by providing a favourable habitat (e.g. bushes for nesting sites and other indigenous vegetation) that can house pest predators • Reduce mortalities through proper animal care and disease prevention • Any sick or injured animals should be treated or cared for to alleviate pain and distress as soon as practically possible, including being isolated or humanely destroyed if necessary. • Animals should be confirmed dead before disposal, and any still alive should be euthanized immediately. Dead animals should be removed	

			promptly and disposed of appropriately. • Identify and contain sick animals and develop containment and cully procedures for adequate removal and disposal of dead animals under the guidance from the national regulation.	

Annex 3.2: Environmental Code of Practices for small infrastructure

With the potential impacts and risks identified in step #2, a set of mitigation measures can be determined to address these potential impacts, and furthermore, make the project environmentally and socially sound. The potential impacts and risks of small infrastructure: demolition, construction, trenching and refurbishment works are localizable, predictable, and manageable through the implementation the ECOP. The ECOP provides the guidance for the environmental and social risk management during the implementation of the Project.

Small infrastructure sites supported under the Project are required to comply with the ECOPs in Annex 3.2. and this will be specified in the contractors' agreements. The ECOPs should be read in conjunction with the following Project documents:

- Environmental and Social Management Framework (ESMF)
- Labour Management Procedure (LMP)
- Stakeholder Engagement Plan (SEP)
- Project Operational Manual (POM)

At both the design and construction phases, the mitigation measures can be implemented at various stages such as site selection and engineering design, site clearance, and construction activities. It is very important to be aware that the stakeholders responsible for implementing the mitigation measures at each stage would also be varied, typically:

- The E&S consultants will support the Provencal MAL/the Engineer for incorporating the proposed mitigation measures related to the site selection, engineering design, and construction.
- The Contractor will be responsible for implementing the mitigation measures to avoid or minimise potential impacts that may occur during construction phase.
- MAL with the support of E&S consultants will ensure the Environmental Code of Practices for the construction phase to be integrated into the bidding/contractual document.

Reporting

Six-monthly reports will be prepared by the project/MAL team with the support of the E&S consultants. throughout the project and submitted to the World Bank. The semi-annual environmental and social monitoring reports to the World Bank will include: (i) the status of the implementation of mitigation measures, ESMF, and other instruments; and (ii) the findings of monitoring programs (iii) stakeholder engagement activities (iv) grievances log: information on any grievances received and how they were resolved; (v) any incidents/accidents with adverse impacts and the actions taken to address it and prevent reoccurrence. Incidents/accidents must be reported in accordance with the World Bank Safeguards Incident

Response Toolkit' (SIRT).

Part 1 – Environmental Code of Practice for the Design Phase

Sub-project name and brief description: ……

Location Village and Province: ……

Filled in by the Provincial MAL:

Verified by the E&S Consultants:

Environmental Code of Practices for Small infrastructure design

Issue		Environmental /Design Solutions
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 ca 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
Accessibility		Build safe access for users/operators
		Others (specify)
Trees, object s		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 disc point not at the side where residential houses are
		Others (specify)
		Staircase safe and convenience for special uses (small c 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 eva
		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 h 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 is space designed for planting trees, plants and flowers by communities
		The building insulated from solar heat with locally available r materials, such as palm leaves?
		Others (specify)

Part 2 – Environmental Code of Practice for the Construction Phase

Sub-project name and brief description: ……
Location Village and Province: ……
Filled in by the Provincial MAL:
Verified by the E&S Consultants:

ECoP #1. Small infrastructure construction to be included the bidding/contractual document

No.	Potential Impacts/ Risks	Description of Impacts/ Risks	Typical activities that cause Impacts/ Risks	Codes of Practices or Mitigation Measures	Responsible
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 the construction phase. This impact can be avoided, minimized or mitigated.	• Site clearance for a construction site, camps, • Construction material exploitation and/or storage	• Store topsoil from excavated area for vegetation planting/reinstatement at the end of construction • Only cut trees and remove vegetation in areas specified in the design. • Keep the area of vegetation removal minimal. Avoid loading the pipes, timbers, construction tools on vegetated areas. Place them on barren soil • Restore vegetation cover on barren soil at the end of construction • Plant native trees to compensate for trees logged for timber used in the sub-project or create vegetation cover • Refill excavated areas and cover with top soil for vegetation cover to regenerate • Others (specify)	• Contractor • Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

2.	Loss or degradation of valuable natural/ ecological resources	• Sand or gravel from reserved beaches or riverbeds should be protected and not extracted or procured construction. • Coral 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 a great variety of fish and marine life. • If large amounts of sand, gravel and stones from the riverbed are extracted, the flowing pattern of the 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 riverbeds and banks and thereby cause serious problems elsewhere • Protected areas, wetland, mangrove area, swamp, bird sanctuary, seagrass beds are essential to biodiversity and earth and may also have valuable landscape. • Some sites may be significant to local communities in cultural/religious/ historical/archaeological aspects. • If construction takes place at or nearby such sensitive socio-environmental features, threats or severe/ permanent damages may be caused to such sites. Such potential high impacts should be identified in the early stage of subproject planning and avoided in the ART project.	• Site/land clearance • Construction Excavation • Natural resource for construction materials at important sites particularly corals from the sea, trees from a protected area, sand and gravel from riverbeds etc.	• Erect temporary fences to protect the preserved trees before commencement of any works within the site. • 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. • Only use legal timber for construction by requiring the supplier to show a certificate for timber • Only use local native species of vegetation for planting and restoration of natural landforms • Do not dig excessive amounts of sand, gravel or rocks from rivers for construction. • Do not extract materials from coral reefs for construction materials. • Others (specify)Others (specify)	• Contractor • Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

3.	Degrade existing landscape	• This impacts may occur when vegetation cover/topsoil is removed, or man-made structures are introduced into least disturbing nature, or when new structures obstruct the view to an existing beautiful landscape	• Site clearance • Site excavation • Construction of new facilities in areas with beautiful/valuable landscape	• Maintain vegetation cover where possible • Implement good waste management practices • Cover construction waste with top soil for planting trees/flowers	• Contractor • Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
4.	Solid Waste generation	• Demolished building materials • Excavation and construction-generated waste • Adequacy of reused and recycled waste • Agriculture production and processing waste • Waste is also generated from unused materials: timber/glass/metal, packaging materials or by the workers: lunch containers, leftover food etc.	• Site/land clearance • Temporary storage and disposal of demolished building materials • Excavation & construction activities • Agriculture production and processing • Construction workers daily domestic activities	• Provide waste bins for litter/garbage and refuse collection. Waste bins shall be covered, tip-proof, weatherproof and scavenger proof. • Promote options for reused and recycled waste per the national environmental requirements • Do not burn waste on-site • Store solid waste temporarily on site in a designated area approved by the Work Supervisors • Dispose of demolished building waste and construction waste only in areas approved by local community/authorities • 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. • Reuse recyclable materials where possible. Materials such as wooden plates, steel, scaffolding material, site	• Contractor • Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

				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)	
5.	Wastewater generation	• Wastewater generated by workers from washing and toileting. • Improper management of wastes which could result in soil/ surface water/ groundwater pollution. • Agriculture production and processing waste. Uncontrolled generation of wastewater may cause environmental pollution, nuisance, and health concerns (including COVID-19 virus infection) to workers and the public.	• Agriculture production and processing • Use of construction materials • Workers' domestic activities (including National COVID-19 Preparedness and Response measures) at the sites	• Ensure accessibility to toilets for workers • Do not discharge wastewater from toilets directly into any water body. • Cover and seal off all water collection tanks and septic tanks at the end of construction.	• Contractor • Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
6.	Chemicals, hazardous wastes generation	• Used Oil, paints, fuel, lubricant, batteries, and asbestos-containing materials in the existing buildings are toxic. Some of the solid waste may be cross-contaminated with oil, paints etc. that may be toxic and pose a public health risk • Used chemical containers/spillage	• Site clearance • Vehicle use and maintenance • Painting • Poor storage and disposal of hazardous • Using agricultural chemicals	• Do not use materials containing asbestos for construction • Handling of asbestos-containing materials and other toxic substances is only to be carried out by specially trained and certified workers • Collect used oil, lubricants, cleaning materials, etc. in holding tanks. • Store chemicals with appropriate labelling and signboards • Others (specify)	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
7.	Dust, air pollution	• Exposure to dust and smoke may have health impact: affect the respiratory system, eyes	• Site clearance and construction • Excavation • Running engine • Machinery	• Ensure dust generated from construction activities is minimal and at acceptable level • Spray water in dusty area in dry weather • Cover material stockpiles	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

			• Construction material loading and unloading	• Cover trucks carrying granular materials • Stop construction and spray the site when there are complaints about dust • Vehicles used must comply with SI regulations on allowable emission limits of exhaust gases • Do not burn waste on-site • Drivers must turn engines off if vehicle is idle for more than 5 minutes • Others (specify)	
8.	Noise and Vibration	• Noise disturbs hearing/listening activities and may cause stress/headaches • Vibration may cause cracks /damages to • existing structures	• Pile driving • Soil compaction • Machinery	• Install silencers/mufflers on exhaust of noisy machines in acoustically protected areas • Dampen concrete/roads before cutting • Avoid construction activities before 6am and after 6pm • Inform local communities at least two days before construction takes place during early morning and/or late at night • Others (specify)	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
9.	Increased erosion risks/siltation/ sedimentation	• Slops become less stable when the ground surface is disturbed; water can run faster and can erode the soil on bare slop where vegetation cover does not exist. Therefore, erosion, landslide risks would be increase if a building is located on a hilly slope or construction activities disturb slops. • The eroded topsoil will end up at downslope then being wash down further by rainwater causing highly	• Site clearance and construction • Excavation activities create an unsealed/barren area without vegetation cover during and after construction • Construction works carried out on steep and/or weak slops	• Design slope stabilisation solutions if the works are to be built on slopes • Provide permanent drainage structure if the works is on a slope • Include energy-dispersion structures in drainage system • Avoid excavation works during wet season	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

		turbid water and riverbed/stream siltation/sedimentation		• Keep ground clearance area to minimal levels possible • Reinstate vegetation cover at earliest opportunity • Carry out shaping and re-profiling cutting of slopes to minimise erosion potential • Replant trees on exposed land and slopes to prevent or reduce land collapse and keep the stability of slopes • Maintain drainage system to ensure they are free of mud and other obstructions • Maintain original condition of undisturbed area at construction sites • Others (specify)	
10.	Water quality degradation, salinity intrusion risks	• Waste and wastewater, construction materials from construction may be leaked or disposed of into water sources nearby construction sites or downstream of construction sites. • 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. • Careless water use activities by workers, for example, washing working tools directly at water sources. • Oil, fuel or any other liquid substance used during construction, including on-site machinery maintenance, maybe leaked or spilled into the soil. Then rainwater may wash such contaminant to nearby water bodies	• Construction of jetty, bridges, pier on streams, riverbeds • demolished building waste and construction waste • Wastewater discharge • Tools and machine washing and maintenance • Surface runoff groundwater extraction during the construction phase • Location of well or borehole close to saline areas	• Avoid ground disturbance near water sources • Design and install sediment traps to collect sediment from rainwater before surface flow enters water bodies • Do not wash tools in streams, rivers or lakes • Do not dispose of construction materials and waste in water bodies • Follow chemical management instruction (Coded H) to prevent chemical leaks into water bodies • Others (specify)	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

		• When fresh water is extracted from a drilled well near a shoreline, localised water level drawdown will occur. If the salt-fresh water interfere located nearby the well or groundwater is over withdrawn, saline water may be mobilised into the well			
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 a low-lying area where drainage is poor	• Construction solid materials and waste loading, dumping	• Maintain existing drainage if possible • Create drains surrounding material loads stored at the work site • Periodically clean up drains at the site	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
12.	Impacts on cultural sites such as a church, historical site, graveyard, etc.	• Cultural sites may be affected with dust, noise from material and waste loading/disposals • Some artefacts may be exposed during the execution of earthworks at the sites	• Dust and noise generated activities Loading/unloading construction materials and wastes	• 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 • Spray water regularly if construction is near any cultural structure • Chance Find Procedure: detailed in Annex of ESMF • Others (specify)	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
13.	Social disturbance to the local community: traffic/ transportation water supply irrigation farming, community meetings events/ etc.	• If the works are carried out on or near the existing road, construction activities may disturb or disrupt traffic on the existing roads. • Excavation may also cause loss to vegetation cover or disturbance to the ground Excavation works may disrupt the operations thus the services provided by existing local facilities such as water supply,	• Site clearance • Excavation • Machinery operation • Construction work • Temporary blockage of rivers/streams/ existing irrigation canal for construction • Temporary block of the road for construction of	• Inform community at least one week before site clearance is started • 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 numbers)	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

		drainage, power supply etc. if the pipes/lines cross excavated areas • Stockpiles formed from excavated materials If construction activities take place near a farming area, access to farmland may be interrupted; materials, waste, and wastewater from construction sites may enter farms causing productivity reduction and social conflicts • Suppose a construction site is located near a community centre, school, health centre, or church. In that case, material loads or noise from material cutting, drilling, welding, may block access to community centres or disturb hearings in public meetings. • Temporary water shortage due to higher demand or temporary disruption	connection section to a new alignment • Increased water demand during construction or temporary disruption of supply	• Respond to telephone inquiries and written correspondence in a timely and accurate manner • Monitor community concerns and information requirements as the project progresses • 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). • Inform local residents about construction and work schedules, interruption of services and demolition where applicable • 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 • Reinstate all disturbed areas including roads • Others (specify)	
14.	Health/ sanitation /hygiene in the local community	• Stagnant water formed from a disturbed area at the construction site is a favour for mosquito breeding, which is a vector of water-borne diseases	• Excavation create holes or low laying spots • Workers improper disposal of wastes, open toilets • Increased water use	• See specific measures relevant to various types of sub-projects	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

		• Waste generated from workers staying at the site may attract vermin and insects • Wastewater generation may cause nuisance and health risks to human			
15.	Safety risk to the community	• Construction-related activities may cause safety risks for the local community, particularly children if they access to open holes or present at the site during materials transports/loading/unloading.	• Transportation of materials/wastes • Materials loading/unloading • Excavated holes • Machinery operations	• Brief workers on occupational health and safety (OHS) in line with the local legal requirements and WBG EHS guidelines • Install fences, barriers, dangerous warning/prohibition signs around the construction area • Implement traffic control measures, including road/rivers/canal signs and flag persons to warn of dangerous conditions • No children allowed to be around during excavation, installation of structures particularly bulky items • Others (specify)	Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants
16.	Workers Health and safety	• Some toxic materials such as paint, oil, the battery may be used during construction. Some construction materials may contain asbestos. • If workers are in contacts such materials without proper protection, health hazard may be resulted from the handling, breathing from such materials. • Unprotected holes at the sites, exposure to traffic at the roadside, improperly installed electrical wires,	• General construction activities, operations of tools and plants in contact with hazardous substances such as paints etc. • Sick workers close contact, working when sick, untreated workers	• Use protective gear while working • Respect the National COVID-19 Preparedness and Response measures • Others specify	• Contractor Provincial MAL officer and MAL's E&S focal points with support of the E&S consultants

		operating and handling of construction plants, machinery and tools may cause safety risks to workers • Spread of Communicable infectious diseases including COVID-19			

Part 3 – Contractor's Workers Environmental Code of Conducts

Note: Workers Environmental Code of Conducts will also be integrated into the bidding/contractual document

DO:	DO NOT:
◆ USE THE TOILET FACILITIES PROVIDED – REPORT DIRTY OR FULL FACILITIES ◆ CLEAR YOUR WORK AREAS OF LITTER AND BUILDING RUBBISH AT THE END OF EACH DAY – use the waste bins provided and ensure that litter will not blow away. ◆ REPORT ALL FUEL OR OIL SPILLS IMMEDIATELY & STOP THE SPILL FROM CONTINUING. ◆ SMOKE IN DESIGNATED AREAS ONLY AND DISPOSE OF CIGARETTES AND MATCHES CAREFULLY. (Littering is an offence.) ◆ CONFINE WORK AND STORAGE OF EQUIPMENT TO WITHIN THE IMMEDIATE WORK AREA. ◆ USE ALL SAFETY EQUIPMENT AND COMPLY WITH ALL SAFETY PROCEDURES. ◆ PREVENT CONTAMINATION OR POLLUTION OF STREAMS AND WATER CHANNELS. ◆ ENSURE A WORKING FIRE EXTINGUISHER IS IMMEDIATELY AT HAND IF ANY "HOT WORK" IS UNDERTAKEN e.g. welding, grinding, gas cutting etc. ◆ REPORT ANY INJURY OF WORKERS OR ANIMALS. ◆ DRIVE ON DESIGNATED ROUTES ONLY.	◆ REMOVE OR DAMAGE VEGETATION WITHOUT DIRECT INSTRUCTION. ◆ MAKE ANY FIRES. ◆ POACH, INJURE, TRAP, FEED OR HARM ANY ANIMALS – this includes birds, frogs, snakes, etc. ◆ ENTER ANY FENCED OFF OR MARKED AREA. ◆ DRIVE RECKLESSLY OR ABOVE SPEED LIMIT ◆ ALLOW WASTE, LITTER, OILS OR FOREIGN MATERIALS INTO THE STREAM ◆ LITTER OR LEAVE FOOD LYING AROUND. ◆ CUT TREES FOR ANY REASON OUTSIDE THE APPROVED CONSTRUCTION AREA ◆ BUY ANY WILD ANIMALS FOR FOOD; ◆ USE UNAPPROVED TOXIC MATERIALS, INCLUDING LEAD-BASED PAINTS, ASBESTOS, ETC.; ◆ DISTURB ANYTHING WITH ARCHITECTURAL OR HISTORICAL VALUE ◆ USE OF FIREARMS (EXCEPT AUTHORIZED SECURITY GUARDS) ◆ USE OF ALCOHOL BY WORKERS DURING WORK HOURS ◆ WASH CARS OR MACHINERY IN STREAMS OR CREEK

◆ PREVENT EXCESSIVE DUST AND NOISE	◆ DO ANY MAINTENANCE (CHANGE OF OILS AND FILTERS) OF CARS AND EQUIPMENT OUTSIDE AUTHORIZED AREAS ◆ DISPOSE TRASH IN UNAUTHORIZED PLACES ◆ HAVE CAGED WILD ANIMALS (ESPECIALLY BIRDS) IN CAMPS ◆ WORK WITHOUT SAFETY EQUIPMENT (INCLUDING BOOTS AND HELMETS) ◆ CREATE NUISANCES AND DISTURBANCES IN OR NEAR COMMUNITIES ◆ USE RIVERS AND STREAMS FOR WASHING CLOTHES ◆ DISPOSE INDISCRIMINATELY RUBBISH OR CONSTRUCTION WASTES OR RUBBLE ◆ SPILL POTENTIAL POLLUTANTS, SUCH AS PETROLEUM PRODUCTS ◆ COLLECT FIREWOOD ◆ DO EXPLOSIVE AND CHEMICAL FISHING ◆ USE LATRINES OUTSIDE THE DESIGNATED FACILITIES; AND ◆ BURN WASTES AND/OR CLEARED VEGETATION.

Annex 4 - Land Commitment Letter Template[22]

Provincial MAL Officer: ----------
Provincial MAL Coordinator/E&S Consultant: ----------
Province:----------

Dear Sir/Madam,

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 the 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 landowners fully agree that this commitment is irrevocable.

1. Resource owner (Name) 2. Resource owner representative

_____ _____

Signature

_____ _____

Date

_____ _____

[22] *adopted from RDP II*

Verified by Project Chairman and Secretary

_____ _____

Chairman Secretary

Annex 5.1 Proposed Outline of Environmental and Social Management Plan[23]

An Environmental and social management plan (ESMP) is an instrument that details (i) the measures to be taken during the implementation and operation of an activity to eliminate or offset adverse environmental and social impacts, or to reduce them to acceptable levels; and (ii) the actions needed to implement these measures.

The E&S Consultants may need to develop an Environmental and Social Management Plan (ESMP) for proposed project activity, for example, for setting out how the environmental and social risks and impacts will be managed through the project lifecycle. Any ESMP prepared for Project activities should be prepared with regards to the following project documents:

- Environmental and Social Management Framework (ESMF)
- Labour Management Procedure (LMP)
- Stakeholder Engagement Plan (SEP)
- Project Operational Manual (POM)

The ESMP should be incorporated into the contractors bidding document and/or contract.

Proposed Elements of Location-Specific ESMP:

1. Location/Project Description/E&S Baseline Information

- Concisely describes the proposed location and its geographic, ecological, social and temporal context including any offsite investments that may be required (e.g. access roads, water supply, etc.). Normally includes a map showing the location and project areas of influence.

- Description of the proposed works.

- Describes relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences.

2. Potential Impacts

Predicts and assesses the likely positive and negative impacts.

3. Mitigation Plan.

The ESMP should identify measures to reduce potentially significant adverse environmental impacts to acceptable levels. The plan should include compensatory measures if mitigation measures are not feasible. Specifically, the mitigation plan:

[23] *Adopted from RDP II*

- identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous people or involuntary resettlement);

- describes--with technical details--each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;

- estimates any potential environmental impacts of these measures;

- identifies magnitude of risk and who is responsible for the implementation of the measure and timing; and

- provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.

4. Monitoring Plan

The plan should provide information about key environmental and social aspects of the project, particularly their impacts of the project and the effectiveness of mitigation measures. It identifies monitoring objectives and specifies the type of monitoring, with linkages to the potential impacts identified and the proposed mitigation measures. Specifically, the monitoring plan provides

a. a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and

b. monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

5. Implementation Arrangements and Capacity Development

a. cover other sub-plans such as (i) location-specific stakeholder engagement plan, (ii) disclosure and consultation, (iii) grievance redress mechanism, (iv) and others.

b. provides a specific description of institutional arrangements--who is responsible for carrying out the mitigatory and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).

7. Implementation Schedule and Cost Estimates

a. provide an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and

b. describe the capital and recurrent cost estimates and sources of funds (e.g. per the project cost tables. for implementing and monitoring the ESMP.

8. An Example of Table of Contents

Table of Contents
1 Introduction 1.1 Description 1.2 Scope and Development 1.3 Integration of ESMP
2 Potential Environmental and Social Impact Identification 2.1 Environmental Impacts 2.1.1 Air Pollution 2.1.2 Water and Wastewater Pollution 2.1.3 Solid Waste 2.1.4 Noise 2.1.5 Odor 2.1.6 Occupational Health and Safety (OHS) 2.1.7 Community Health and Safety (CHS) 2.1.8 etc. 2.2 Social Impacts 2.2.1 Occupational Health and Safety (OHS) 2.2.2 Community Health and Safety (CHS) 2.2.3 Conflicts 2.2.4 Gender-Based Violence 2.2.5 Others
3 Environmental and Social Management Plan 3.1 Proposed Mitigation Measures 3.2 Monitoring Plan 3.3 Contractors ESMP
4 ESMP Implementation 4.1 Institutional Arrangement 4.2 ESMP Monitoring and Reporting 4.3 Schedule and Implementation Budget 4.4 Stakeholder Engagement Plan 4.5 Disclosure and Consultation 4.6 Grievance Redress Mechanism
5 Capacity Development and Training 5.1 Capacity Development 5.2 Training 5.3 Budget for ESMP implementation

Annex 5.2. A proposed Terms of Reference of consultant

TERMS OF REFERENCE

Environmental and Social Consultant

Project:	**Agricultural Rural Transformation Project**
Location:	**Ministry of Agriculture and Livestock, Solomon Islands**

Role Title:	**Environmental and Social Consultant**
Duration:	**xxxxx**
Expected Start Date:	**xxxxx**

1. BACKGROUND

The Solomon Islands is receiving funding from the World Bank to implement the Agricultural Rural Transformation Project (P173043-ART) to increase agricultural production and provide improved market access in selected value chains, enhance institutional capacity and in the events of such eligible crisis or emergency, to provide an immediate response to the eligible crisis and emergency. The project's intermediate outcomes are defined as (i) improved access to agriculture extension and support services and (ii) improved agribusiness partnerships and market linkages. Further detail of the project is presented in the Project Appraisal Document (see attached). Ministry of Agriculture and Livestock (MAL)'s Project Management Unit (PMU) will comprise a staffing complement of the project management, procurement, financial management, and environmental and social management staff and environmental and social consultants.

The ART project will apply the World Bank's Environmental and Social Framework (ESF), a new policy, which will help to better manage the environmental and social risks and to improve development outcomes. There are 10 Environmental and Social standards (ESSs) under the ESF.

2. OBJECTIVES OF THE ASSIGNMENT

MAL is seeking to hire a Consultant to be employed in the Solomon Island and report to the Project Manager with close collaboration with MAL's Environment and Social (E&S) Focal Points. The consultant will ensure that environmental, social, health and safety risks are managed in accordance with the requirements of the World Bank's ESF and national regulations.

3. SCOPE OF WORKS

The Environmental and Social Consultant is expected to carry out the following activities associated with efficient and effective ART Project implementation:

- Lead the implementation of the project's Environmental and Social Management Framework (ESMF) and other instruments in accordance with the World Bank ESF, project Environmental and Social Commitment Plan (ESCP) and Solomon Island legal requirements including:

- Conducting Environmental screening and risk assessment, preparing and disclosing of site-specific instruments, performing consultation and information dissemination activities with relevant

stakeholders, collecting data and conducting fieldwork as required;

- Site-based environmental, safety and social monitoring;
- Developing and delivering the environmental, social, health and safety (ESHS) training for relevant stakeholders must be COVID-19 safe;
- Addressing non-compliances and develop and confirm the implementation of corrective actions;
- Assisting with the implementation of project investment opportunities that would improve performance;
- Notifying, reporting and managing incidents or accidents related to the Project which have, or are likely to have, a significant adverse effect on the environment, the affected communities, the public or workers.
- Providing advice to the PMU on key environmental issues and aspects of the Project in a timely manner, including general environmental advice and advice on the implementation of safeguards instruments;
- Managing the oversight of project consultants and contractors including Civil Works Contractors;
- Providing support and training for Civil Works Contractors to prepare demolished building waste and construction waste management and health and safety plans;
- Managing environmental and social risks in procurement and the construction materials;
- Overseeing the implementation of the project's Stakeholder Engagement Plan in close collaboration with the E&S Focal Points and Provincial MAL;
- Coordinating the implementation of the project's Grievance Redress Mechanism ensuring timely resolution of project-related grievances;
- Participating in semi-annual Project Supervision missions, representing MAL on environmental, safety and social aspects;
- Preparing the monthly and six-monthly monitoring reports on the ESHS performance of the Project;
- Attending World Bank missions, field trips, meetings etc. as required; and
- Conducting other ESHS related activities as required.

4. DELIVERABLES AND REPORTING OBLIGATIONS

- Environmental and Social work plan, based on the implementation progress of the project (detailed for 12 months and conceptual for subsequent years)
- Monthly monitoring progress report on the ESHS performance of the project

- Program for the community and stakeholder consultations
- Capacity building plan
- Materials and reporting for all training conducted annually
- Establishment and management of the Project's Grievance Redress Mechanism
- Provide environmental inputs into the Project
- Review technical outputs of the Project to ensure compliance with the Project's ESMF and other instruments.

5. QUALIFICATIONS AND EXPERIENCE REQUIREMENTS

The consultant in responding to this TOR should confirm their availability to meet the time commitments and demonstrate their experience working in integrated teams or projects. Qualifications and experience required are described below:

- A bachelor's degree in resource management, environmental science, social science, planning, anthropology or similar relevant discipline.
- At least 5 years of relevant experience in community consultations, impact assessment, data collection and analysis, and report writing at the policy level.
- Demonstrated ability in effective project management is essential, including expertise in work planning, ability to work independently and in a team; effective at providing advice and output on time; and ability to communicate effectively and build relationships with a range of stakeholders.
- Knowledge and experience in the agriculture and livestock sector is an advantage.

Annex 6. Standard for Good Agricultural Practices (GAP): Fruits and Vegetables

The introduction of GAP supported by the project, will not only strengthen the trade position of the participating farmers and POs but also the agriculture sector as a whole. Improving awareness and providing training, in accordance to COVID-19 safe measures, and access to respective certifications is crucial for producers, processors, and exporters. Strengthening the MAL's role in the quality assurance system of agriculture and livestock products is expected to complement other projects' efforts and add additional value. GAP is to focus on not only food safety, sustainability for the environment, and economic sustainability; but also improving natural resources use, workers' health and working conditions. According to FAO24, the standardized principles for good agricultural practices (GAP) shall include the following:

1. OBJECTIVE

The fundamental objective of laying down this standard is to strengthen Good Agricultural Practices (GAP) for fruits and vegetables in countries. The challenges currently being faced by most countries include the absence of standards for good practices in the farming sector. Most of the food safety standards are focused on end products, whether mandatory technical standards or voluntary standards.

2. PURPOSE

The purpose of this document is to set out Good Agricultural Practices to be implemented by producers of fruits and vegetables to improve the safety and quality of their produce, while at the same time protecting the environment and safeguarding the health and safety of their workers.

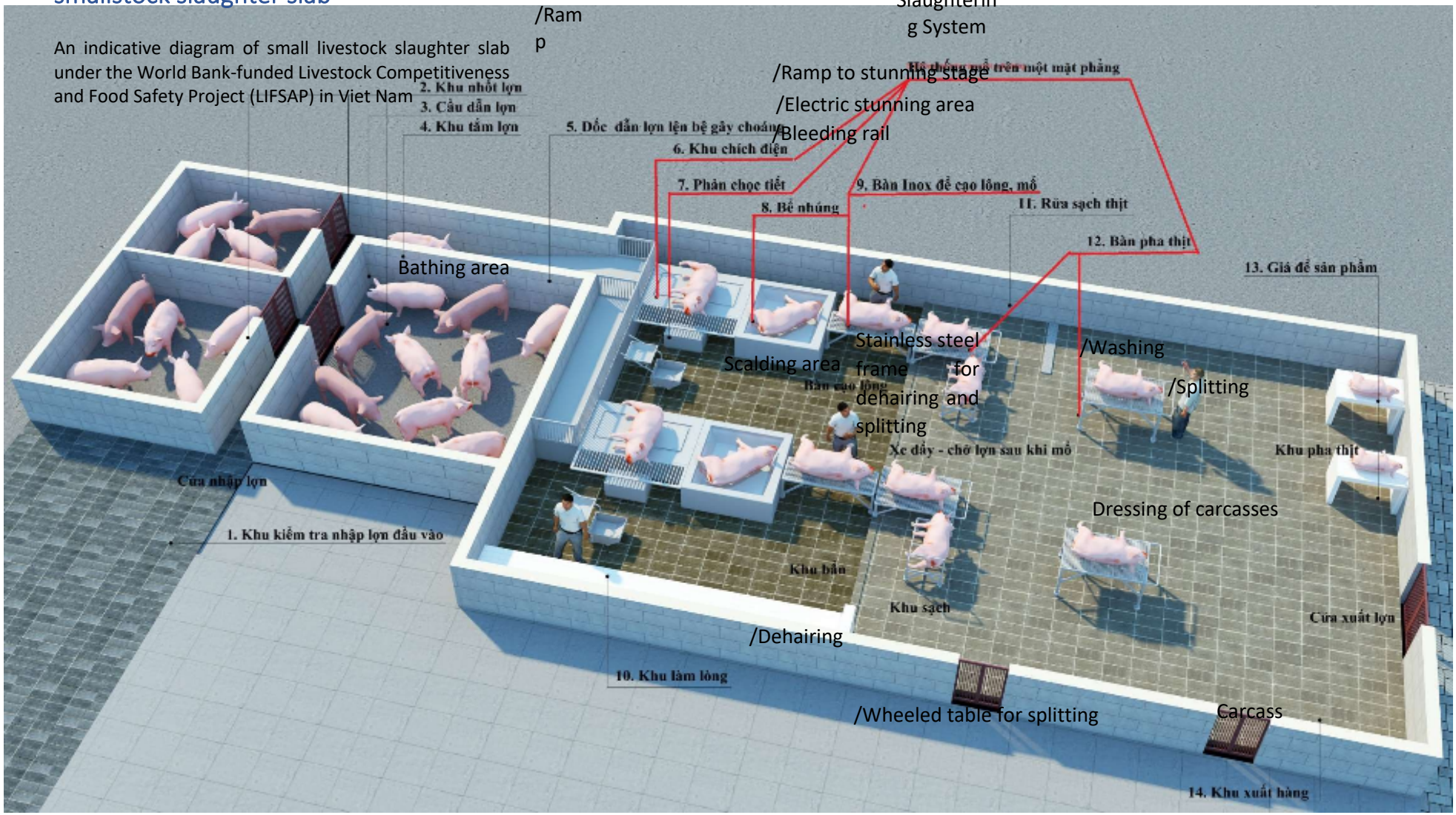
3. SCOPE

This standard specifies the requirements of GAP with respect to all types of fresh fruits and vegetables covering activities such as production, harvesting and post-harvest handling of farm produce and pack house operations for produce either for sale for direct human consumption or to be used for further processing by the food industry. The standard may be used for all types of production systems, namely conventional production systems where produce are grown in the soil and hydroponic systems where produce are grown in inert media. Production may occur in the open or in a protected environment. High-risk products such as sprouts and minimally processed produce such as cut fruits and vegetables are not covered by this standard. The standard does not provide any basis for certification of organic products, but these products can also be certified as GAP compliant in cases where GAP requirements are implemented. In some countries the regulatory policy does not permit cultivation of GM crops and therefore this aspect needs to be addressed accordingly. This standard further categorizes the criteria/requirements, based on their importance, as "critical", "major" or "minor".

[24]Accessible at http://www.fao.org/3/a-i6677e.pdf

Annex 7. An indicative diagram of a smallstock slaughter slab

An indicative diagram of small livestock slaughter slab under the World Bank-funded Livestock Competitiveness and Food Safety Project (LIFSAP) in Viet Nam



Note about the pig slaughter slabs planned for the ART project: the slaughter slabs are designed according to the FAO three-tier system, which includes, (i) killing floor and bleeding out, (ii) dehairing in hot water bath, and (iii) evisceration of carcass hanging from overhead transport rail with gambrels. The slab will have a 10m by 20m concrete floor with peripheral drainage channel leading into a liquid waste management system. A 1 m high concrete block side wall surrounds the slab with bird-proof screened vertical walls leading to typhoon-proof roofing. The slab has a small records office and holding pens and is surrounded by a chain link fence for security. A pressurized water supply is required. Slaughter operations will be entirely manual, carried out by three slaughtermen: killing floor, dehairing, and slaughter. A hand-operated or rechargeable carcass splitting sow is used. Carcasses are delivered to retail in half- or quarter cuts. The dehairing vat is heated to 60 degrees Celsius, using coconut husks as fuel. To avoid smoke from entering the slaughter area, the dehairing vat should be located outside the main building. Slaughter waste is either buried or sold to pig farmers using swill feeding. Humane killing will be carried out, using a captive bolt pistol, The capacity of each slab will be up to 20 pigs per day for 200 slaughter days per year for an annual throughput of 4,000 pigs.

The slaughter slabs in Solomon Islands is proposed to include an overhead transport rail.. Installing a rail is more costly but has several advantages including but not limited to:
-- easier movement of carcass between slaughter stations, saving time and manual labor;
-- better drainage of carcass when heading in vertical position;
--better hygiene, when carcass does not touch the floor and hangs freely suspended; and
--better quality meat due to better drainage and resulting less spoilage.

Appendixes

Appendix 1. Pest Management Plan (PMP)

Appendix 1. PEST MANAGEMENT PLAN (PMP) of the ESMF

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
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
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

1.0 Introduction

This Integrated Pest Management Plan (PMP)[25] is adopted from the RDP II project to provides a framework for ensuring the project supports environmentally sound pest management procedures. It directly addresses World Bank ESF approach and ESS3: Resource Efficiency and Pollution Prevention and Management as part of the Environmental Management and Social Framework (EMSF) for the project.

The PMP[26] has been prepared to address the requirements of the national legislation and the World Bank ESS3: Resource Efficiency and Pollution Prevention and Management and, consistent with the ART PROJECT 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.

1 2.0 Policy, regulatory Framework and institutional capacity

1.1 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[27]
Montreal convention

1.2 2.2 Pesticides Legislation and Control in Solomon Islands

Pesticides control of distribution and use in Solomon Islands (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:

[25] Adopted from RDP II
[26] It should be noted that although the term integrated pest and disease management (IPDM) has been adopted by most research institutions in the Pacific, the term PMP, adopted by the World Bank, is interpreted as all encompassing and of the same meaning for the purposes of this document.
[27] Annex 1 lists the chemicals under the Stockholm and Rotterdam Conventions.

- 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:

- 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 and RDP II projects and is in the process of registering a number of pesticides.

1.3 2.3 Policy and Organizational Issues

Currently in Solomon Islands (SI) there is no over-arching government policy or strategies for integrated pest management (PMP) 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 PMP.

1.4 2.4 Institutional Arrangements and Collaboration

As the PMP will be an integral part of the of all the products that could potentially be funded under ART PROJECT, capacity building activities would be carried out under the project.

Apart from for cocoa there is currently no proper PMP in place for the other industries, in SI although recommended procedures for production provide examples of PMP 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.

2 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 briefly discusses the current and anticipated future impact of the pests on Cocoa, Coconut, Sweet Potato, Oil Palm and other household and commercial crops.

2.1 **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.

2.2 **3.2 Coconut**

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.

2.3 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.

2.4 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 PMP 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 rainfed. 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.

2.5 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 PMP programme for slippery kabis with better understanding of the flea pest.

2.6 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 PMP 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.

2.7 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.

2.8 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.

2.9 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.

2.10 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 PMP approaches.

2.11 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 leafminers 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.

Fruitflies which have data on should be mentioned. Presence of fruitflies is a hindrance to fruits vegetable export and loss in food security and income.

2.12 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.

2.13 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, 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.

2.14 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. Regarding the alternative pest control measures and cultural practices include pruning, companion planting, hand picking, nets/physical barriers plant derived pesticides (e.g., derris root, chili, tobacco extract). Other organic certified pest control products and compost and organic fertilizer have been used effectively in Solomon Islands and should be promoted more as an alternative to using agrichemicals.

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 PMP is necessary. Therefore, for the future PMP developments and implementations should take place to prevent the mis-uses of pesticides.

3 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 agricultural 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 PMP programme currently in operation; therefore, no pesticides are used in PMP 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.

3.1 4.1 Pesticides that may be required

- 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 ART PROJECT. 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 ART PROJECT – this is an indicative list only*

Formulations	Common Names	Use
Delfin	Bacillus thuringiensis var. Kurstaki	Slippery kabis, cabbages, watercress, etc.

◆ Xentari	◆ B. t. 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 ART PROJECT

- 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.

4 5.0 Current PMP Practice

4.1 5.1 General PMP principles

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

4-Biological control of pests and diseases, if and when available, by using natural predators or biological control agents such as insects, fungi, bacteria & nematodes. The biological control is the attractive alternative to the agrochemicals, the use of environmentally friendly alternatives to the chemical pesticides are absolutely required in agriculture. No chemicals are used, therefore there's less pollution, disruption of the food chain & risk to the people eating the food. MAL extension officers will use resources of NGOs and FAO to raise awareness to farmers and members of POs about methods of biological control of pests and diseases in the local areas.

4.2 5.2 Current PMP methods used in SI

There is no explicit PMP policy in SI, with the main control being focused on cultural practices - although the cocoa and oil palm industries provides an exception with an PMP practice. Cultural practices are often the first level of defense, 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 buildup 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 *Phytopthora palmivora* and Vascular Streak Dieback (VSD) caused by *Oncobasidium thoebromae* 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 ART PROJECT will work with CCIL to import these clones for testing and distribution to farmers in SI.

5 6.0 Pesticide Management

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

5.1 6.1 Occupational and Health Risks and Mitigation Measures

While chemical fertilizers and pests are not commonly used due to its high costs and accessible constraint, there is a need for much more emphasis by MAL on awareness and training of occupational health safety (OHS) measures and "best practice" methodologies so that the use of agrichemicals is minimised and if used are used and disposed of safely. Even where training has been given, some farmers do not always

follow up and implement the practices.

PMP methods are based on good agricultural practices (GAP) 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 taught and explained by MAL Extension Officers on the proper measures or procedures for the safe use, handling, application, storage and disposal of chemicals, in accordance to the national 'Safety at Work (Pesticide) Regulations 1982' in Section 2 and good international industry practice (e.g., FAO's Guidelines on Good Practice for Application of Pesticides, 2001). The health safety measures 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.

- Never transport pesticides in the passenger area of a vehicle; instead, place them in the trunk or truck bed. If you must transport pesticides in a station van, secure them in the back away from passengers and pets and open the side windows.

- Keep away from animal feeds, fertilizers and seeds.

- 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.

It is important that pesticide chemicals and spray equipment be safely and securely stored. They should be stored in a separate shed or at least in a separated and locked part of an existing equipment shed. The shed or storage area must be well away from dwellings and must only be used for equipment and maintenance materials. By adhering to this, the incidence of pesticide poisoning could be minimized.

5.2 6.2 Overview of Training and Human Resource Development

Training of small farmers on PMP is an integral part of ART PROJECT activities for all enterprises covered under ART PROJECT. Small farmers need to know and understand how they can produce quality products while minimizing any negative impact on the environment.

5.3 6.3 Training of Farmers

Under ART PROJECT, 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 ART PROJECT. Other training modules could include Sustainable Livelihood.

All these will be delivered through the various productive partnerships within ART PROJECT.

During community consultation, a number of sentiments were expressed about different modalities for the delivery of this training. Training on PMP 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.

6 7.0 Monitoring and Evaluation

MAL with support of the environmental and social consultants would be responsible for monitoring the PMP, the ESMF and other instruments. It would be the responsibility of this TA to train the relevant project staff (E&S focal points, coordinator, M&E Officers and any other staff involved in monitoring activities) and to routinely visit the partnerships and activities established ART PROJECT, and to report to the PMU on any issues arising with the implementation of pest management practices.

6.1 **7.1 Activities Requiring Monitoring**

The application of PMP 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 PMP 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.

7 Annex 1: List of chemicals under Stockholm & Rotterdam Conventions

Stockholm Convention	Rotterdam Convention
Annex A aldrin chlordane dieldrin endrin heptachlor hexachlorobenzene mirex toxaphene polychlorinated biphenyls (PCB)	**Pesticides** 2,4,5-T aldrin captafol chlordane chlordimeform chlorobenzilate DDT dieldrin 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 industrial chemicals asbestos (actinolite,anthophyllite, amosite, tremolite) Tetraethyl and tetramethyl lead

8 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	Alternative control measures	Remarks
Insecticides				
Abamectin 0.15%EC	Beans, Cabbages, Watermelons	Aphids, Whiteflies, mites	Farmer produced plant derived pesticides (e.g. derris root) plant based oils (e.g. eucalyptus or tea tree, or citrus oils) or soap solutions	Abamectin is gram positive branching bacteria, *Streptomyces avermitilis*
Carbaryl	Watermelons, slippery kabis, rice	Flea beetles, pumpkin beetle, and other insects	Farmer produced plant derived pesticides (e.g. derris root)	TTM sells this to watermelon growers for control of the pumpkin beetle.
Chlorpyrifos	Many crops and household uses	Many pests	Farmer produced plant derived pesticides (e.g. derris root) plant based oils (e.g. eucalyptus or tea tree, or citrus oils) or soap solutions	Broad spectrum used for both indoor and outdoor pest control.
ICON	Household pests, especially mosquitoes	Mosquitoes control in public health programme	Citronella oil, mosquito repellent plants, clean up and remove mosquito breeding sites around homes/villages	Some farmers use this also on crops for pest control.
Karate	Slippery kabis, cabbages, watermelons, beans	Bollworms, aphids, plant bugs, thrips, beetles, Spodoptera spp.	Farmer produced plant derived pesticides (e.g. derris root)	Broad spectrum synthetic pyrethroid for control of wide range of crop pests.
Lambda 2.5%EC	Same as for Karate	Same as for Karate	Farmer produced plant derived pesticides (e.g. derris root)	Same as for Karate
Malathion	Crops and domestic use	Crop and domestic pests	Farmer produced plant derived pesticides (e.g. derris root) plant based oils (e.g. eucalyptus or tea tree, or citrus oils) or soap solutions	Old insecticide; many crops pests are resistant to Malathion.
Mavrik	Slippery kabis, beans, cabbages	Aphids, caterpillars, beetles, etc.	Farmer produced plant derived pesticides (e.g. derris root) plant based oils (e.g. eucalyptus or tea tree, or citrus oils) or soap solutions	Mostly used for chewing and sucking insects

Mustang	Taro	Taro beetles	Cultural methods, wood ash sawdust etc.	One of the registered insecticides for use for TB control in PNG
Orthene/Otin	Rice, vegetables and many other crops	Brown planthopper, rice leaf roller, diamondback moth, bollworm, aphids, leaf miners and many other pests.	Farmer produced plant derived pesticides (e.g. derris root)	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	Farmer produced plant derived pesticides (e.g. derris root) plant based oils (e.g. eucalyptus or tea tree, or citrus oils) or soap solutions	Mo common SP in use many places.
Pyrethrum	Crops and household pests	Many pests on ornamental and garden crops – aphids, caterpillars, etc	Farmer produced plant derived pesticides (e.g. derris root)	A natural insecticide
Success	Vegetables and fruits	Bollworm, hornworm, fruitworm, armyworm, cluster caterpillar, diamondback moth, large cabbage moth, and others	Farmer produced plant derived pesticides (e.g. derris root), and crop hygiene, biological control.	A biopesticides certified for use in organic agriculture
Target	Vegetables and ornamentals	Bollworm, hornworm, fruitworm, armyworm, cluster caterpillar, diamondback moth, large cabbage moth, and others	Farmer produced plant derived pesticides (e.g. derris root), and crop hygiene, biological control.	Mixture of permethrin and primiphos-mehtyl
Molluscides				
Yates Baysol	Gardens	For control of snails and slugs	Cultural methods , ash or sawdust barriers around plants. Hand picking and feeding to livestock. Potential biological control with a parasitic flatworm	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	Cultural methods , ash or sawdust barriers around plants. Hand picking and feeding to livestock. Potential biological control with a parasitic flatworm	Bait pellets scattered in gardens or on periphery of gardens. Avoid development of moulds.
Fungicides				
Axiom	Vegetables, crops, ornamentals	Leaf spots, anthracnose, rusts, scabs, downy mildews, etc	Use copper sprays, crop hygiene and good ventilation and light conditions, growing crops under plastic shelter in the wet seasons	A protectant fungicide for used on crops and seed treatment.
Borrek	,,	Leaf moulds, leaf spots, downy mildews, late blights, fruits rots, etc.	Use copper sprays, crop hygiene and good ventilation and light conditions, growing crops under plastic shelter in the wet seasons	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	Good pruning, to improve air movement and light conditions in the crops	Registered as Cobox in 1986
Herbicides				
Amine 720	Pastures, playing fields, lawns, cereals	Selective for control of broadleaf weeds	Hand removal, regular slashing or brushing of pastures. Don't overgraze pastures, pasture rotation.	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	Hand removal, regular slashing or brushing	Translocated herbicide; also is used for killing of trees by drilling.

Gramoxone	Oil palm, crops and general weed control	Non selective for all weeds	Hand removal, regular slashing or brushing	A general knockdown herbicide; high oral and dermal toxicity; its phasing out in many countries
Grasskill	Same as Glyphosate	Same as Glyphosate	Hand removal, regular slashing or brushing	Same as Glyphosate
Timber treatments				
Borracol	Timber	For treatment of processed timber		Insecticide/fungicide mixture for timber treatment
Eco-Bor	Timber	For treatment of processed timber		Insecticide and fungicide mixture used for timber treatment
Others				
Cockroach gel bait	In houses	For control of cockroaches	Good hygiene, cleaning and remove food sources	Placed in places where cockroaches breed or tracks
Rat tracking powder	Farms, building, industrial areas	For tracking and control of rats	Use traps, sticky paper and biological control (cats and snakes), farm/household hygiene remove food and breeding sites	Can be mixed with wheat or other materials as baits
Scarecrow bird repellent	Birds	For scaring birds in crops		

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10 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 Tetrahydrate	U	Timber treatment
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)