Environmental Assessment and Review Framework

July 2014

Solomon Islands: Transport Sector Flood Recovery Project

Prepared by the Ministry of Infrastructure Development, Government of Solomon Islands for the Asian Development Bank.

ABBREVIATIONS

ADB	Asian Development Bank
CEMP	construction environmental management plan
CPIU	Central Project Implementation Unit (within MID)
CPP	Consultation and Participation Plan (for the project)
CSS	Country safeguard system
DMSP	Domestic Maritime Support (Sector) Project
DSC	Design and supervision consultant
EARF	Environmental Assessment and Review Framework
ECD	Environmental and Conservation Division (within MECDM)
EIS	environmental impact statement
ESS	Environment safeguards specialist (in DSC team)
IEE	initial environmental examination
MECDM	Ministry of Environment, Climate Change, Disaster Management and Meteorology
MID	Ministry of Infrastructure Development
MLHS	Ministry of Lands, Housing and Survey
MOU	memorandum of understanding
NSS	National safeguards specialist (in DSC team)
NTF	National Transport Fund
NTP	National Transport Plan
PER	Public Environmental Report
SPS	Safeguards Policy Statement
SSS	Social safeguards/resettlement specialist (in DSC team)
TSDP	Transport Sector Development Project

CURRENCY EQUIVALENTS

(as of 30 June 2014)

Currency unit	Solomon Islands Dollar (SBD)
SBD1.00	$0.13670
$1.00	SBD 7.27273

CONTENTS

I. INTRODUCTION

1. **Background**. On 3-5 April 2014, prolonged heavy rainfall associated with a tropical depression, which later became Tropical Cyclone Ita, caused severe flooding in Solomon Islands. While the damage was widespread across Guadalcanal, Malaita, Makira-Uluwa, and Isabel provinces, the worst affected area was the capital, Honiara. Major infrastructure including roads, housing, sewerage systems, and water supply systems were damaged or destroyed. Several bridges collapsed, bridge approaches were washed away, and 7,300 houses were badly damaged in Guadalcanal Province. The flooding resulted in 23 fatalities, internally displacing 10,000 people, and affecting approximately 52,000 people in total. On 4 April 2014, the government of Solomon Islands declared a state of disaster for Honiara and Guadalcanal Province, and on 5 April the government requested international emergency assistance to aid relief efforts.

2. Due to a combination of large flows and debris build-up, bridges experienced extensive damage including damage to piers, abutments, approaches, scour protection and service connections, and several bridges collapsed or completely washed away. Culverts and approaches of causeways were damaged or completely washed away due to excessive flows. The accumulation of debris and sediments blocked road side drainage and some channels were eroded, and road shoulders were severely damaged. Landslides were also recorded in several places, and the submergence of roads for extended periods after the flooding resulted in accelerated degradation of the pavement. Access was cut-off at several locations in Honiara, east Guadalcanal, west Guadalcanal, and Henderson International Airport (east of Honiara) was closed for two days. Economic losses in road transportation resulted from increased travel times due to congestion and lengthier alternative routes, as well as direct payments required by some landowners for use of land as road diversions at cut-off locations. Vehicle operating costs will also increase due to the poor condition of roads and diversions.

3. During May 2014, Asian Development Bank (ADB), World Bank and other development partners conducted a rapid assessment of the damages.[1] The total damage and loss was estimated at $107.7 million, equivalent to 9.2% of the gross domestic product. Nearly a quarter (23%) of all damage was sustained in the transport sector. The assessment highlighted that the repairs to roads and bridges should be addressed as soon as possible to minimize secondary impacts on the economy, and to restore connectivity to essential services such as hospitals, schools, markets and main commercial centres in Honiara.

4. In assessing reconstruction needs, the government has prioritized the reconstruction of transport sector infrastructure and adopted the building-back-better principle by requiring that damaged assets be rebuilt to a higher standard of climate and disaster resilience. Total recovery and reconstruction needs for transport sector are estimated at $34.6 million.

5. **The project**. ADB emergency assistance will be provided through a sector approach - Transport Sector Flood Recovery Project (the project) - for reconstruction of transport infrastructure damaged by the flash floods. The project will use the similar implementation arrangements to the ongoing ADB Transport Sector Development Project (TSDP). Some of the current TSDP consultant services will be reoriented to assist in the feasibility studies, design and tendering of civil works for repair of damaged infrastructure.

[1] Government of Solomon Islands, 2014. *Rapid Assessment of the Macro and Sectoral Impacts.* Honiara.

6. The impact of the project will be improved access to socio-economic opportunities during disasters. The outcome will be restored connectivity through more climate and disaster resilient infrastructure.

7. The main output of the project will be transport infrastructure reconstructed to pre-flood levels in priority locations in east and west Guadalcanal and in the outer islands. The subprojects will include repairs to both paved and unpaved roads, bridges, culverts and drainage systems, including climate and disaster proofing.

8. Project preparation was undertaken between June and August 2014 in response to the April request from the government to provide emergency assistance. The Ministry of Infrastructure Development (MID) will be the executing agency for the project and through the Central Project Implementation Unit (CPIU) will be responsible for overall implementation of the project.

9. The purpose of this environmental assessment and review framework (EARF) is to provide a procedure for the environmental assessment and clearance of subprojects that will be identified during the course of the project. The objective of the EARF is to ensure that any environmental impacts of the project are identified, appropriately addressed and mitigated to acceptable levels.

II. LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

10. Environmental assessment and clearance of subprojects under the project will comply with the country safeguard system (CSS) of Solomon Islands and ADB safeguard policy where there are gaps between CSS and best practice as set out in the Safeguard Policy Statement 2009 (SPS).

A. Solomon Islands Country Safeguard System

11. Environmental management in the Solomon Islands is provided through the Environment Act, 1998 and the accompanying regulatory instrument the Environment Regulations, 2008. Both are administered by the Environment and Conservation Division (ECD) within Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM).

1. Environment Act 1998

12. The Environment Act provides for an integrated system of development control, environmental assessment, and pollution control. Article 4.1 vests the Act with considerable power which states that in the event of conflict between the Environment Act and other legislation, the Environment Act shall prevail. Part II establishes and defines the powers and role of the ECD.

13. Part III establishes the requirements for development consent, environmental assessment, review and monitoring. This requires assessment of certain activities through either a public environmental report (PER) or if the development is shown to be of such a nature as to cause more significant impacts then the developer is required to prepare an environmental impact statement (EIS).

14. Activities that require development consent and assessment are described as prescribed activities and are included in the Second Schedule of the Act. Prescribed activities that are listed in the Schedule that will apply to the project include:

- Activity 3 Non-metallic industries - (d) extraction of aggregates stone or shingles
- Activity 9 Public Works Sector - (b) infrastructure developments.

15. Part IV details requirements for pollution control and emissions (noise, odor and electromagnetic radiation) and requirements to permits for the discharge of waste. Article 49(2) requires that any vessels do not to discharge waste into the environment unless the vessel complies with prescribed discharge standards. Noise and interference with antipollution devices are covered under Article 50(1) while restrictions on emitting unreasonable noise are covered in Article 51(1).

2. Environment Regulations 2008

16. The Environment Regulations establishes the procedures for undertaking the environmental assessment of any projects categorized as prescribed activities. The developer is required to first submit a development application following which the MECM determines whether (i) no further assessment is required, (ii) a PER, or (iii) where major projects are considered such as logging, large agricultural developments, mining and large scale tourism developments and infrastructure projects, an EIS is required which includes technical, economic, environmental and social investigations. Both the PER and EIS require Public Consultation. Following approval by the MECM, a Development Consent is issued.

17. While environmental standards are not provided in the Regulation, the MECM requires World Health Organization (WHO) standards to be used. While the Guidelines provide for licenses to discharge waste or emissions, the enforcement of these would appear to be difficult without defined standards.

3. Other Legislation and International Conventions

18. Other legislation could also apply to the project as follows.

19. The Wildlife Protection and Management Act 1998. Frames the Convention on International Trade in Endangered Species (CITES) agreements and together with the Wildlife Protection and Management Regulations of 2008 establishes procedures for the import and export of wildlife and plants. It includes a schedule of wildlife that are prohibited for export and a second schedule of wildlife that can be exported subject to notification.

20. The Mines and Minerals (Amendment) Act 2008. Part VIII of this Act will need to be complied with in regard to mining and extraction of aggregate. Article 64 requires that Building Material Permits (BMP) be issued for the extraction of building materials.[2]

21. The Provincial Government Act 1997 gives power to the provinces to make their own legislation including environment and conservation. Schedule 3 of the Act provides a list of activities for which the provinces have responsibility to pass ordinances including: (i) cultural and environment - protection of wildlife, coastal and lagoon shipping; (ii) agriculture and fishing - protection, improvement and maintenance of freshwater and reef fisheries; (iii) land and land use - codification and amendment of existing customary laws about land; (iv) registration of customary rights in respect of land including customary fishing rights; (v) physical planning except within a local planning area; and (vi) waste disposal.

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[2] This Act defines "building materials" as clay, gravel, sand and stone used for buildings, roads or other construction purposes.

22. There is no legislation concerning preservation of cultural sites. The National Museum within the Ministry of Culture and Tourism have several archaeologists on their staff and should a site be suspected of having cultural or historic significance the following procedure is recommended and should be implemented before construction starts at any possibly significant site: (i) review the environmental assessment to see if any mention is made of any significant sites. Ensure the environmental management plan includes a procedure for "chance finds"; (ii) some sites have been registered by the provincial governments - these registers should be checked; (iii) discuss the site with the local communities and verify whether they know of any tambu sites; (iv) where there are considered to be possible risks of discovery ask the National Museum to evaluate the site; and (v) if a discovery is made stop work at the affected site and request the National Museum to evaluate the discovery.

23. Labour Act 1978 deals with employment of workers. Part IX Care of Workers, Article 65: establishes the requirements for employers to provide workers with acceptable working conditions, health and accommodation etc.

24. The Safety at Work Act 1996 states that it is the duty of every employer to provide a safe workplace and to ensure the health and safety of employees under his control. The Safety at Work (Pesticide Regulations) 1983 deals with the registration and use of pesticides.

25. Other legislation that has implications for resource development and management and potentially the project is included in Appendix 1.

26. Solomon Islands is a signatory to a number of international agreements with environmental and conservation implications. These may be found in Appendix 1.

B. Institutional Framework and Capacity

1. Ministry of Environment, Climate Change, Disaster Management and Meteorology

27. The following findings draw upon reports prepared under the *Technical Assistance to Strengthening Country Safeguard Systems in the Transport Sector in Solomon Islands*.[3]

28. MECDM derives its legal mandate from the Environment Act 1998 - Part II Administration. The ministry comprises four divisions – Meteorological Services, Environment and Conservation, Climate Change, and Corporate Services. MECDM strives to fulfil four key functions according to its Strategic Corporate Plan;

- Policy and legislation functions – (i) advise on policy formulation; (ii) support legislation and regulation development; and (iii) monitoring international obligations as per conventions and protocols;
- Enforcement of environment standards and regulations – (i) processing development consents; (ii) review of environment assessments; (iii) monitoring; and (iv) reporting;
- Advocacy, coordination, capacity development and funding – (i) provide leadership for the promotion and implementation of government conservation and environment policies and legislation; (ii) information management; (iii) awareness and education programs; (iv) training, capacity development programs; (v) raising funding from donors; and

[3] ADB. 2014. *Draft Institutional Capacity Assessment* under TA 8217-SOL.

- Service provision and program implementation – (i) provide key environment-related and met data services; (ii) implement specific programs in collaboration with key stakeholders; and (iii) international representation.

29. As of September 2013 MECDM had 103 staff positions, of which 16 positions were vacant. Within MECDM, Meteorology is the largest division comprising 50 personnel, while ECD has 12 staff, and Climate Change has six staff. ECD and Climate Change Division together accounted for almost half of those vacant positions (seven in total). The Deputy Director, Environment position was only filled very recently (March 2014), and an Environment Officer (Guadalcanal office) position is still vacant. The Permanent Secretary position was filled in July 2013 after being vacant for more than a year.

30. In total ECD has a total of 13 staff including the Director, six of which are in the Environment Section and one officer is away on study leave. Most staff have been with MECDM for more than five years, and all ECD staff are graduates with bachelor degrees.

31. The ECD Director is also Head of the Environment Section and is responsible for managing the section and the development consent process which includes the PER/EIS review. The Director grants the development consent license to a proponent pending the activity meets the environmental assessment procedural and technical requirements. The Director's role and responsibilities are outlined in the Environment Act 1998, and that of the officers' are generally noted in the Act to be elaborated at the organizational level. However current job descriptions are out-dated and are due for further review in line with the current efforts of the new PS on work-plan preparation and organizational review.

32. In its operations, ECD suffers from budget and administrative constraints in comparison with other divisions in MECDM. Meteorological Services Division had the largest budget and highest expenditure. Notably, there was little budget for environmental assessment review and monitoring, and overall monitoring and evaluation funds were the lowest in five years. The 2013 recurrent budget for ECD sees the largest allocation to civil servant salaries (26%) with little or no budget for development consent and assessment review and monitoring, information and data management, training, awareness raising, and capacity building.

2. Ministry of Infrastructure Development

33. MID has as its legal mandate the Roads Act (Cap 129) which will be repealed in favour of the Infrastructure Management Bill (2013). MID comprises six divisions: Mechanical and Workshops (39 persons), Architecture and Buildings (15 persons), Transport Infrastructure (28 persons), Solomon Islands Marine and Shipping Agency (35 persons), and the Human Resources Department (18 persons).

34. Since the 2000s MID has been receiving substantial assistance in the transport sector through support from ADB and Australian and New Zealand governments.[4] The TSDP which commenced in 2011 aims to improve MID's effectiveness through more comprehensive transport sector-based approach and channelling financial resources through the National Transport Fund (NTF). TSDP is also designed to address environment and social safeguards in a manner consistent with CSS and ADB's SPS.[5]

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[4] Including Post-Conflict and Emergency Recovery Project, Solomon Islands Emergency Assistance Project, Solomon Islands Road Improvement (Sector) Project, Domestic Maritime Support (Sector) Project, Second Solomon Islands Road Improvement (Sector) Project and Transport Sector Development Project.

[5] In general an initial environmental examination undertaken to comply with ADB's environment safeguard policy is deemed equivalent to public environmental report as required under the Environment Act 1998. TSDP procedures follow the safeguards frameworks - Environmental Assessment and Review Framework (EARF) and Resettlement Framework (RF) – approved in 2010 (RRP SOL 41171).

35. The CPIU within MID was established to strengthened and improve the technical and managerial capacity throughout MID and implement the National Transport Plan (NTP) through the NTF.

36. The TSDP includes an institutional strengthening component which is further supported by parallel technical assistance.[6] The institutional capacity assessment work to date has resulted in a corporate plan for the development of MID. The capacity strengthening of the technical skills of MID staff involves training needs assessments, determining individual training plans, and conducting extensive formal training programs. This component will also build capacity of national contractors and consultants, and communities, including supervisors, foremen and technicians, in supervision and quality control for labour based equipment supported (LBES) maintenance.

37. A Safeguards Unit has been established in CPIU and includes consultants and MID staff being guided by an international safeguards specialist providing intermittent inputs. The full-time members of the Safeguards Unit include; social safeguards specialist (and head of the unit), environment safeguards officer, community development and gender specialist, and three community liaison officers. The TSDP agreements and grant covenants require MID secure two additional positions within the CPIU structure to recruit safeguards officers. Current development proposals for the CPIU include new positions for a Principle Safeguard Officer /Social (PN 127) and a Principal Safeguards Officer/Environmental (PN 128). These will staff positions will be responsible for community liaison officers (PN 125 & PN 124 respectively). In the most recent recruitment bid (February 2014), MID was successful in obtaining approval for one of the two safeguard positions, the Principal Safeguards Officer/Environmental (PN 128).

C. ADB Safeguard Policies

38. The objectives of ADB's safeguards are to: (i) avoid adverse impacts of projects on the environment and affected people, where possible; (ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and (iii) help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks. Through its SPS ADB establishes policy objectives, scope and triggers, and principles for three key safeguard areas of environment, involuntary resettlement, and Indigenous People. The SPS sets out the process to be applied from screening, through due diligence and assessment to monitoring and reporting.

39. **Screening and Categorization.** SPS requires project screening and categorization at the earliest stage of project preparation. Screening and categorization is undertaken to (i) reflect the significance of potential impacts or risks that a project might present; (ii) identify the level of assessment and institutional resources required for the safeguard measures; and (iii) determine disclosure requirements.

40. ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of four categories.[7] The category determines the level of assessment required.

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[6] ADB. 2011. *Technical Assistance for Supporting the Transport Sector Development Project* (TA 7715-SOL) in parallel to Grant 0243-SOL: Transport Sector Development Project.

[7] Category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and impacts may affect an area larger than the sites or facilities subject to physical works.

41. **Due diligence.** ADB's safeguard due diligence emphasizes planning, environmental and social impact assessments and safeguard documentation. Through such due diligence and review, ADB will confirm (i) that all key potential social and environmental impacts and risks of a project are identified; (ii) that effective measures to avoid, minimize, mitigate, or compensate for the adverse impacts are incorporated into the safeguard plans and project design; (iii) that the borrower/client understands ADB's safeguard policy principles and requirements and has the necessary commitment and capacity to manage the risks adequately; (iv) that, as required, the role of third parties is appropriately defined in the safeguard plans; and (v) that consultations with affected people are conducted in accordance with ADB's requirements.

42. **Monitoring and Reporting.** Both government and ADB have their own separate monitoring responsibilities. The extent of monitoring activities, including their scope and periodicity, will be commensurate with the project's risks and impacts. Governments, through implementing agency, are required to implement safeguard measures and relevant safeguard plans, as provided in the legal agreements, and to submit periodic monitoring reports on their implementation performance. Monitoring and supervising of social and environmental safeguards is integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued.

43. **Safeguard frameworks.** Frameworks are required for projects, such as sector projects, where the types of activities to be undertaken and types of subprojects to be implemented are known in general terms but only a small number of subprojects might be identified during project appraisal. The frameworks set out the processes to be followed for the sector project as a whole and for individual subprojects as and when they are identified. The frameworks will cover the types of subprojects to be implemented (in terms of identifying generic impacts and mitigations) and clearly identify the process to be followed (from screening through to monitoring) and the implementation arrangements (procedures, roles, responsibilities, and budget).

44. Subproject selection, impact assessments, and safeguard monitoring plans prepared during project implementation will conform with the safeguard frameworks agreed to by ADB and the government.

D. Review of Country Safeguard System

45. A legal review and diagnostic undertaken as part of *Technical Assistance to Strengthening Country Safeguard Systems in the Transport Sector in Solomon Islands*[8] concluded that the environmental legislation of Solomon Islands is fully equivalent with 26 of the 80 key elements of the ADB environmental safeguards principles (32.5%) including some of the basic components of environmental assessment. National legislation is partially equivalent with 29 (36.2%), and not equivalent with 25 (31.3%) of the key elements.[9]

46. The review made recommendations for revision to the Environment Act and the Environment Regulations to bring about full equivalence with the ADB environmental safeguards:

Category B if its potential adverse environmental impacts are less adverse than those of category A projects, impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed readily. A project is Category C if it is likely to have minimal or no adverse environmental impacts.

8 ADB. 2013. *Technical Assistance for Strengthening Country Safeguard Systems in the Transport Sector in Solomon Islands*. Manila. (TA 8217-SOL, $600,000, approved on 16 November 2012, financed by Japan Fund for Poverty Reduction).

9 ADB. 2014. *Draft Country Safeguard Review and Legal Assessment* under TA 8217-SOL.

- Introduction of criteria to be taken into account by the Director when deciding if a proposed prescribed development requires a PER or an EIS. Currently there are no such criteria (compare with criteria in Regulation 10 for deciding that no environmental assessment at all is required);
- Clarifying that scoping is only required for prescribed developments that require EIS (scoping is not usually required for PER developments);
- Establishing a review panel to provide technical review and opinion on submitted EIS and environmental management plan (EMP) to the Director to assist him in the decision-making process;
- Introduction of the steps required for scoping for EIS – in particular the need for terms of reference to be prepared for an EIS;
- Detailed requirements for the terms of reference for EIS;
- Detailed minimum requirements for the PER;
- Detailed minimum requirements for the EIS;
- Detailed requirements for the EMP; and
- Increasing the time for public consultation from 30 days to 120 days.

47. A second phase TA will develop and take a forward a number of the recommendations. The new transport sector project to be developed for implementation in 2015 will integrate the recommendations as far as possible into the manuals to be developed to support implementation of the NTP. These will include safeguard manual which will describe the existing CSS and the measure proposed to strengthen it in line with best practice.

III. ANTICIPATED ENVIRONMENTAL IMPACTS

48. This sector project will repair and reconstruct damaged transport infrastructure and will target damaged bridges, culverts and low level crossings (causeways) necessary for re-establishing connectivity. Minor road repairs and re-instatement or repair of drainage systems will be included. The project will include works in three segments of road – east Guadalcanal, west Guadalcanal, and Gold Ridge road - and will reinstate connectivity at the damaged locations

49. Based on experience with other projects in the sector implemented since 2000, it can be anticipated that most of the impacts will be site-specific, are not particularly significant as road segments and bridges to be repaired will be reconstructed within their existing location, i.e., within already existing road corridors. Thus, land acquisition and associated issues with regard to disturbance of cultural sites, destruction of significant vegetation and significant habitats is unlikely to be an issue in the subprojects. The project's objective is to re-establish connectivity and therefore new roads will not be constructed. If realignments are proposed as a climate proofing or adaptation measure, they will be screened and assessed as per the safeguards frameworks.

1. Design and Location Impacts

50. **Climate change.** The design of roads at either inland or coastal locations will consider potential impacts of climate change including: sea level rise, extreme high tides, storm surges, coastal flooding, cyclones, and heavy rainfall events. Much of the damage that has occurred to structures within the Solomon Islands is due to heavy rainfall events arising from prolonged heavy rainfall and subsequent debris carried in deluge events.

51. The TSDP has been developing climate change adaptation and resilience guidelines. The process for integrating suitable measures in the designs will be a requirement of the project. The project administration manual includes input by a climate change adaptation specialist who will guide this process.

52. **Runoff management design.** Based on mitigations identified in environmental assessments and integrated into EMPs and successfully implemented in previous projects, roadside storm water drainage will include the following recommendations:

- Cross drainage using culverts will be carefully evaluated to ensure that systems do not fail from excessive discharge.
- Where the road traverses ridges, side drains (off-takes) are required to direct storm water flows away from the road. These are to be established at 2 m vertical intervals (VI) where bare earth channels will be maintained. If a 2 m VI cannot be achieved then consideration will need to be given to vegetated channels with a VI of 4 m or otherwise armored with concrete or half round steel pipes.
- Where cross drains are required stable outlets will provided that can carry the runoff safely to the disposal area. Culverts and drains must not be allowed to terminate above a disposal area without considering the possible effects on the stability of the discharge area.
- All pipe and box culverts must have flared level outlets and be provided with a vertical cut-off wall at the end of the apron that extends at least 0.35m below the apron to avoid the apron being undercut.
- All culverts are to discharge to safe (non-eroding) areas.
- Regular maintenance of roadside drainage systems is required.

53. **Flora, fauna and protected areas.** Flora and fauna will be identified in the environmental assessments. Measure to mitigate any impacts on flora and fauna will be integrated into the EMP. As noted previously, the road corridors do not traverse critical or natural habitats and not in, or adjacent to, protected areas or conservation areas.

54. **Land acquisition.** A resettlement framework has been prepared for the project. This will guide the process for any work that necessitate access to land beyond the existing road corridor, including temporary access arrangements required while new bridges are being constructed. The procedures set out in the resettlement framework will be followed by the CPIU and DSC. Any resettlement plans or due diligence reports, as required, will be submitted to ADB for review and clearance.

2. Construction Impacts

55. **Air quality.** During the construction phase, the activities that could produce impacts on air quality are emissions from vehicles or machines and dust raised from the construction activities. Solomon Islands currently does not have emission or air quality standards. Since the impact on air quality is likely to be minimal, no rigorous air quality monitoring is expected to be required.

56. Dust may become a nuisance to surrounding communities from construction activities. Where dust will be an issue, the contractor will limit the area opened and reduce vehicle movements. Water will be sprayed on affected areas as required to keep dust down both at the worksite and on haul routes that pass through residential areas. Stockpiles may also release dust into the surrounding area.

57. **Noise.** There are villages and noise sensitive receptors (school, health center, church) within the road corridors. In such locations noise will be controlled, with no construction activities taking place between 1900 hrs and 0700 hrs. Ideally, noise should not exceed 45 dBA measured at the outside of any house or noise sensitive receptor.

58. **Vibration.** For compaction of the road base and materials/aggregate or other activities such as pile driving for bridges, the contractor will establish the following:

- Type and size of impact of equipment
- Zone of influence for the equipment
- The contractor will be the responsible for assessing the condition of buildings that may be susceptible to vibration within the zone of influence before commencing any work.
- The contractor will be responsible for any damage caused as a result of operating this equipment.
- Prior to commencing work with any vibrating machine, the contractor will arrange to advise people in nearby houses that this work is due to commence.

59. **Sources of aggregates.** Sources of materials for the project will comply with the MID's Guidelines for Sourcing Road Construction Materials.[10] Should a contractor elect to source aggregates locally, the contractor will be required to ensure that aggregate is sourced from sites that have a building materials permit issued by the Ministry of Mines, Energy and Rural Electrification either to the owner of the quarry or directly to the contractor for the extraction of materials. Any site that is opened by the contractor will comply with relevant laws and requirements including plan for re-instatement after completion of work.

60. **Soils and erosion.** During construction, excavated areas will need to be assessed for potential soil erosion damage and protection arranged as necessary to avoid the movement of eroded soil from the site into watercourses and onto adjoining areas including the worksite. Arrange to limit the area that is being excavated and use soil conservation technology such as silt fences to reduce and control erosion from these areas. At the completion of work, all disturbed areas will be stabilized by re-vegetation techniques.

61. **Water quality.** Water quality can be affected during construction activities when soils, wastewater, oils and lubricants, sewage and other materials are allowed to move into the environment. Construction activities that may exacerbate the movement of these materials into the fresh or marine water environments will be examined and mitigation measures developed.

62. **Flora, fauna and protected areas.** During the construction phase, flora and fauna can be affected, but any potential impacts are considered to be minimal as the construction work will be performed at previously developed sites and the previous operation of the road will have already disturbed fauna in these areas. The works will focus on reconstruction within existing corridors. The road corridors do not traverse critical or natural habitats and not in, or adjacent to, protected areas or conservation areas.

63. **Physical cultural resources.** Existing roads are unlikely to be located in areas where there are any known physical cultural resources (sites, areas) that could be damaged during excavation or other construction activities. The EMP contained in the environmental assessment will include chance find procedures, in the event of any accidental discovery during construction activities. The contractor will consult with local leaders and authorities if new sites for sourcing materials are identified to allow for areas of cultural importance to be avoided.

[10] Prepared for MID under Solomon Islands Road Improvement (Sector) Project (2012).

64. Potential material or quarry sites are anticipated to be existing sites, but where new sites are brought into operation for the project, the contractor will be required to follow the Guidelines for Sourcing Road Construction Materials which requires prior to commencing material removal (i) a plan setting out site[11], volume, methodology of extraction, transport and stockpile, and mitigations be prepared by contractor and cleared by MID/CPIU, and (ii) obtaining a building materials permit from Ministry of Mines, Energy and Rural Electrification.

65. **Community health and safety.** The EMP will include measures to protect the health and safety of communities including; (i) work sites and camp being properly fenced and guarded; (ii) unauthorized people will not being permitted into the work sites or camp; implementation of the project's consultation and participation plan which will set out the protocols to be implemented by the contractor and which will guide interaction between community and construction workers; and (iv) contractor will engage an approved service provider to deliver sexually transmitted infection and HIV awareness and prevention training and presentations with local communities and the workforce.

66. Reconstruction works will be undertaken through one international competitively bid package. Depending on the different infrastructure needing repair or reinstatement there will be a mix of international and national workers. For example, high level bridge construction will require a larger proportion of skilled labor that will likely need to be provided by foreigners, culvert and scour protection works can utilize a greater proportion of unskilled and local labor. Local people can also be hired as security guards, cooks, cleaners and providers of local produce at works sites and camps. This will reduce possible conflicts between outside labor and local communities. The location of the site and any campsite will be carefully assessed by the contractor, CPIU, and local community leaders to avoid the development of concerns, grievances, or conflicts.

67. **Worker health and safety**: A number of activities, plant and products can give rise to health and safety impacts during the construction phase. Most of these impacts can be managed and/or mitigated. The potential impacts are (i) contamination of local water supplies by potential contaminants such as sediments, fuel products and lubricants, and sewage giving rise to gastro-intestinal problems; (ii) air pollution from exhaust fumes and dust giving rise to respiratory conditions; (iii) risk of accidents at work sites; and (iv) spread of communicable diseases. Contractors will observe general health and safety requirements and as a minimum must be compliant with the Labour Act of 1978 and the Safety at Work Act of 1996. The contractor will be required to provide personal protective equipment to workers.

3. Operation Impacts

68. **Soils and erosion.** Any excavation sites will be either filled in or stabilized during construction. Soil erosion from the road itself is not expected. Roadside drainage systems will require to be maintained and this will require the removal of accumulated sediments or vegetation. If vegetation control is required in drains, this should be removed manually (by slashing) rather than excavated by machine which will leave behind a larger and an erodible surface.

69. **Flora and fauna.** Impacts on flora and fauna are generally expected to be low as the road has already provided the initial access to these areas. As the reconstruction works will take place in existing road corridors there will be no potential for adverse impacts that could arise from increased access to forests or other habitat areas.

[11] The plan will also require the contractor to consult with local leaders and authorities to allow for areas of cultural physical resources, heritage or importance to be avoided.

70. **Health and safety.** While there is not expected to be any significant changes in road locations, the improved surface will increase traffic speed and coupled with greater traffic volumes it is likely that there will be a small increase in accidents. Should safety issues be determined, arrange the installation of traffic calming devices on the road, install signage and increase community awareness of traffic hazards.

71. **Risk of spread of communicable diseases.** Following the re-establishment of connectivity, there is potential risk of spread of communicable diseases resulting from mobility of people. The overall risk is considered to be negligible because the road corridors already exist, they do not provide for any increased access beyond rural communities within the corridors, and minor risk will be mitigated by the implementation of the awareness and prevention campaign conducted during the construction phase.

IV. ENVIRONMENTAL ASSESSMENT AND MANAGEMENT

A. Screening and Classification

72. Both the country system and the SPS require screening of project impacts to determine the potential risks and required level of assessment. The significance of project's environmental impacts determines the environmental categorization of the project. The subprojects (three segments of road) are existing road corridors and therefore the project will not require implementing works in areas of critical or natural habitat or protected or conservation areas.

73. The overall project has been classified on a preliminary basis as category B. It is likely that each subproject will be category B, this will be confirmed through a screening when sites and specific works required are known. The screening will be required to separately address specific sites for major works at crossings (high level or low level bridges) whereas the screening of culverts and drainage reinstatement can be aggregated for each road segment as impacts of these smaller scale works are not likely to differ between locations.

74. The screening and project descriptions will be submitted as part of the development consent application. ECD will determine, based on that information, whether a PER or EIS is required.

B. Preparation of Environmental Assessments and Environmental Management Plan

1. Environmental Assessment

75. Environmental assessment in the Solomon Islands is regulated by the Environment Act 1998 and the Environment Regulations 2008. The Environment Regulations establish the procedures for undertaking the environmental assessment of any projects categorized as prescribed activities.[12] The developer is required to first submit a development consent application following which the ECD determines whether (i) no further assessment is required, (ii) a PER, or (iii) where major projects or activities are proposed, an EIS.

76. Both the PER and EIS require public consultations and public notification of the draft EIS. Following review and approval[13] of the assessment by the ECD, a development consent is issued with or without conditions.

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[12] Prescribed Activities that are listed in the Schedule to the Environment Act that will apply to the project include: Activity 3 Non-metallic industries (d) extraction of aggregates, stone or shingles; and Activity 9 Public Works Sector (b) infrastructure developments.

[13] Provided that further information is not required.

77. According to SPS, for both Category A and Category B projects the environmental assessment to be prepared consists of eleven sections, the level of detail required being less for category B projects. The outline contents of an assessment are included in Appendix 2.

78. For the project, the CPIU (supported by consultants) will screen each of the subprojects and submit the screening information and project descriptions to ECD, and prepare the assessment as determined by ECD. This will likely be PER, based on the works, impacts and previous determinations made by ECD for the TSDP. The PER (or EIS) will also include any additional elements so as to comply fully with the SPS.

2. Environmental Management Plan

79. Each environmental assessment will include an EMP which sets out the mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental (in that order of priority). For the project, because a subproject (road segment) will include a number of different types of water crossings in addition to any road repair works, the EMP may include multiple management plans and actions.

80. **Mitigation**. The EMP will summarize the anticipated adverse environmental and social impacts and risks, describe each mitigation measure with technical details, and provide links to other mitigation plans (for example, for resettlement plans or reports) required for the project.

81. **Monitoring**. This part of the EMP will describe monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions. The reporting and disclosure procedures will also be identified.

82. **Implementation arrangements**. The EMP will include an implementation schedule showing phasing and coordination with overall project implementation and describe the institutional organizational arrangements for responsibility for carrying out the mitigation and monitoring measures. This section of the EMP will also identify practical measures to strengthen environmental and social management capability that can be implemented during the project. The section will estimate capital and recurrent costs and describes sources of funds for implementing the EMP.

83. **Performance indicators**. Where possible and practical, the EMP will describe the desired outcomes as measurable events, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods. While environmental standards are not provided in the Regulations the MECDM requires World Health Organization standards to be used.

V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Consultation and Disclosure

84. For any subproject requiring an environmental assessment, formal and documented public consultation and information disclosure will be required in accordance with the ADB SPS and Public Communications Policy 2011 and government's consultation and information disclosure requirements identified in the Environment Act. This will be done at an early stage during preparation of the assessment and is to inform stakeholders of the project components and to encourage input to help identify environmental and community issues and concerns.

85. The information disclosed and feedback provided at the consultation sessions will be summarized, attendance recorded, and the document attached as an annex to the assessment report. Invited participants and attendees at consultation events will include government agencies (including provincial government), village and community representatives, as well as NGOs and civil society organizations.

86. All consultations will follow the procedures set out in the consultation and participation plan (CPP) to be prepared for the project.

B. Grievance Redress Mechanism

87. The process established and implemented under TSDP will be applied for the project (adapted as necessary). The GRM will also be applied to the resettlement planning process and will be used to sort out, as far as possible, problems, concerns or grievances created by the project. If an issue or grievance with a specific environmental concern cannot be resolved then it will be addressed by being referred to the ECD within the MECDM.

C. During Construction and Operation

88. The contractor's responsibility in respect of consultation and communication will be set out in the CPP and the relevant section of the CPP will be integrated into the EMP and bid and tender documents. The contractor will engaged with communities primarily through the community advisory committees and grievance redress committees established in each subproject area. The protocols for behavior of workers and conduct in and around villages will be set out in the CPP and will be an element of the EMP to help mitigate any impacts resulting from construction workforce and camp.

89. As per the GRM, any complaints arriving at the contractor's site office will be recorded in a register that is kept at the site and which will be subject to monitoring. The register will record complaints by date, name, contact address and/or phone number if available, and reason for the complaint. A duplicate copy of the entry is given to the person making the complaint for their record at the time of registering the complaint. The duplicate copy given to the complainant will also show the procedure that will be followed in assessing the complaint, together with a statement affirming the rights of the person to make a complaint.

90. The register will show who has been directed to deal with the complaint and the date when this was made together with the date when the complainant was informed of the decision and how the decision was conveyed to the complainant. The register is then signed off by the person who is responsible for the decision and dated. The register is to be kept at the front desk of the site office and will be a public document. For anybody making a complaint no costs will be charged to the AP.

91. MID and CPIU will be equally responsible for ensuring GRM is in effect during operation and maintenance. The same procedure will be followed except that the complaint is now directed to the CPIU. During operation, the same conditions apply; i.e., there are no fees attached to the making of a complaint, the complainant is free to make the complaint which will be treated in a transparent manner, established during the TSDP.

VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

A. Ministry of Infrastructure Development

92. MID will be the executing agency for the project, and overall implementation responsibility will be with the CPIU. The CPIU has established a Safeguard Unit with support from TSDP. The Safeguards Unit will be consulted to ensure that the procedures and processes established and being implemented under TSDP are replicated for the project as far as practicable. However, application of CSS and SPS under the project will be the responsibility of the design and supervision consultant (DSC).

93. The role of CPIU and its Director will be overall project management and decision making. Feasibility studies (including safeguards assessments and and consultation), detailed designs, and supervision of construction and civil works contractor will be the responsibility of the DSC.

B. Design and Supervision Consultant

94. The DSC will include international and national specialists to implement the tasks set out in the terms of reference included in the project administration manual. Amongst a number of others, the DSC will include: (i) environmental safeguard specialist (international) (ESS); (ii) social safeguard/resettlement specialist (international) (SSS); (iii) safeguards specialist (national) (NSS); and (iv) gender and community development specialist (national) (GCDS). The DSC will be headed by a team leader.

95. General environmental management responsibilities of the DSC include:

- Through the team leader, ensuring that the environmental safeguards are implemented as set out in this EARF so as to meet intended requirements. This includes undertaking safeguards assessments during the feasibility study, ensuring that the EMPs form approved environmental assessments are including as part of construction section and tendering conditions of the bid and contract documents, and monitoring is undertaken.
- Supervising the implementation of the EMP during construction.

96. Within the DSC team, the ESS and NSS will have specific responsibilities for implementation of this EARF. Their duties include:

(i) During the project inception, brief the DSC team on the EARF and safeguard and CPP requirements that need to be implemented during the project.
(ii) Undertaking the screening of each subproject (including individual components such as water crossings at different locations) and identify main environmental impacts and prepare project descriptions.
(iii) Prepare the development consent applications including subproject descriptions and the screening forms, and after approval by CPIU submit to ECD for assessment determination.
(iv) Prepare the assessments (PER or EIS as determined by ECD) for the selected or prioritized subprojects as required to meet the requirements of this EARF.
(v) Undertake adequate consultations with affected people and studies of the subproject area/catchment to identify baseline conditions and impacts;
(vi) Ensure that disclosure of the draft assessments is done in accordance with the project's CPP in compliance with ADB's Public Communications Policy (2011) and government requirements.

(vii) Submit the environmental assessment to ECD. Arrange for a copy and the conditions of the development consent issued by ECD to be sent to the ADB.

(viii) During pre-construction, ensure that issues that need to be addressed by the design engineers are considered. Prepare a design brief containing main requirements for action by the technical design team.

(ix) Based on detailed designs, update the EMP from the approved environmental assessment. Integrate the revised/updated EMP and ECD's development consent conditions into the construction section of the bid and contract documents.

(x) With the GCDS arrange public consultation to advise affected communities of the scope and scheduling of the subproject and to raise awareness within the communities of the likely phasing of events that will occur within their boundaries.

(xi) If required by the team leader, provide a review of environmental management aspects during bid evaluation.

(xii) Following the award of the contract and prior to submission of the construction EMP (CEMP), provide EMP and safeguards induction for the contractor (if required).

(xiii) Ensure that contractor has access to the environmental assessments of the subprojects and the development consent conditions issued by ECD.

(xiv) Evaluate, and when satisfactory, advise team leader and/or CPIU that the CEMP may be approved.

(xv) Advise the contractor of their responsibilities to mitigate environmental impacts and issues associated with construction activities.

(xvi) With the project engineer, supervise and monitor the contractor's compliance with the approved CEMP. As required, issue defect notices concerning non-compliant work which will be channeled to the contractor via the project engineer. Any instructions or requirements for corrective actions will be issued through the project engineer.

(xvii) Prepare reports of site visits and compliance checks at least every two months, contribute to the quarterly progress reports (summary of compliance reports and contractor's monthly reports and any other safeguards activities including training seminars or workshops and the like), and prepare safeguards monitoring reports twice per year.

C. The Contractor

97. The contractor will be responsible for complying with the environmental management requirements included in the contract as follows:

(i) Prior to construction commencing, the contractor will address the construction section of the EMP which will be developed into the detailed CEMP that addresses the development consent conditions and details working statements and methodologies as required by the EMP. It will include a monitoring plan and a reporting program. Submit the CEMP to the DSC for clearance.

(ii) Designate an environmental and safety officer and deputy environmental and safety officer who will take lead responsibility for implementation of the CEMP.

(iii) Provide briefings and training seminars for all workers (and sub-contractors as relevant) on the CEMP and safeguards requirements governing the project.

(iv) Following approval of the CEMP, the contractor is required to attend a site meeting where the CEMP is further discussed to ensure that all compliance conditions are clearly understood.

(v) The contractor's site engineer and environmental and safety officer will be responsible for daily supervision of the CEMP. The contractor is required to undertake work as directed by the project engineer (who will be assisted by the ESS and NSS). If the work is non-compliant with the CEMP or conditions, the contractor must respond to the defect notice issued and rectify the issue or work.

(vi) The contractor will cover CEMP implementation, including grievance redress, in the monthly reports that will be submitted to the DSC. The report will also contain the monthly accident/incident report.

D. Environment and Conservation Division (ECD)

98. The ECD will be responsible for: (i) respond to the development application and determine what assessment is required for each subproject and review the assessment reports when submitted; (ii) issue development consent with or without conditions; (iii) undertake periodic monitoring of the subprojects and implementation of development consent conditions as required; and (iv) undertake to review the environmental grievances or complaints that cannot be resolved through the GRM.

E. Asian Development Bank

99. During the project, the ADB will provide support to the CPIU and DSC as required during review missions and at other times as required. ADB will review and clear environmental assessments prepared for subprojects and safeguards monitoring reports and disclose these documents as per Public Communication Policy 2011. Review missions will review the procedures being implemented by DSC, CPIU, and the contractor, and will include review of screening, assessment, consultations, EMP updating, bid documents, and monitoring.

VII. MONITORING AND REPORTING

100. Each EMP will contain a monitoring and reporting program suitable for the subproject. The DSC will be responsible for reviewing and updating the monitoring program to ensure that it meets the intention of the EMP and the ESS, NSS and contractor will be responsible for carrying it out. The DSC will undertake safeguards supervision and monitoring at least every two months, in addition to CEMP compliance checking being undertaken on a daily basis by the project engineer. Following the supervision and monitoring checks, reports will be prepared and submitted to CPIU and MID.

101. The DSC will prepare quarterly progress reports that will summarize the CEMP compliance monitoring undertaken by ESS and NSS and the contractor's monthly reports. These reports will be submitted to CPIU, MID and ADB.

102. The DSC will prepare semi-annual safeguards monitoring reports on behalf of the CPIU, and submit to MID and ADB. These reports will be disclosed.

103. ADB will prepare a project completion report after the project has finished. This report will summarize safeguards implementation (including any requirements for capacity building) and monitoring and comment on compliance with the EARF.

APPENDIX 1 – RELEVANT LEGISLATION AND INTERNATIONAL AGREEMENTS

A. Relevant Legislation

- River Waters Act, 1973. Establishes activities for which permits are required.
- National Parks Act, 1978. Establishes national parks, restrictions on use and appointment of park rangers.
- Wild Birds Act, 1978. Provides a list of scheduled birds for protection, bird sanctuaries and hunting season.
- Agriculture and Livestock Act, 1982. Lists noxious weeds and their control.
- Lands and Titles Act, 1988. Covers the management of land; defines “customary land” and sets out procedures for land acquisition. The Act is being reviewed.
- The Forestry Bill, 2004, conservation of forests and forest management.
- Fisheries Act, 1998. Lists prohibited fishing methods and provides for establishment of marine protected areas and coastal management plans.

B. International Agreements

Regional Agreements

- Pollution Protocol for Dumping. Ratified 1998. Prevention of pollution of the South Pacific region by dumping.
- Pollution Protocol for Emergencies. Ratified 1998. Cooperation in combating pollution emergencies in the South Pacific region.
- Natural Resources & Environment of South Pacific Region (SPREP Convention). Ratified 1998.
- Waigani Convention on Hazardous & Radioactive Wastes 1995. Ratified 1998. Bans the importation and the trans-boundary movement and management of hazardous wastes within the South Pacific region.

Chemicals, Wastes and Pollution

- Liability for Oil Pollution Damage. Ratified. Liability of ship owner for pollution damage.
- Marine Pollution Convention (London). Ratified. Prevention of marine pollution by dumping of wastes.
- POPs Convention (Stockholm). 2004. Bans use of persistent organic pollutants.

Biodiversity

- CITES, ratified 1998. Regulates trade in wild animals and plants
- World Heritage Convention. Acceded 1992. Protection of sites of Outstanding Universal Values. (East Rennelle Island is listed as a World Heritage site).

- Convention on Biological Diversity (UNCBD). Ratified 1995.
- Desertification (UNCCD). Acceded 1999. Agreement to combat desertification and drought.
- Cartegena Protocol on Biosafety. Acceded 2004. Protection of human health and the environment from possible adverse effects of modern biotechnology.

Climate

- Montreal Protocol. Acceded 1993. Phase out of substances that deplete the ozone layer.
- Ozone Layer Convention (Vienna). Acceded 1993. Protection of the ozone layer.
- Climate Change (UNFCC). Ratified 1994.
- Kyoto Protocol. Ratified 2003. Reduce greenhouse gases especially CO2 by an average of 5.2% by 2012.

APPENDIX 2 – CONTENTS OF ENVIRONMENTAL ASSESSMENT

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

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

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

D. Description of the Environment (Baseline Data)
This section describes relevant physical, biological, and socioeconomic (including cultural characteristics) conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

E. Anticipated Environmental Impacts and Mitigation Measures
This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socio-economic (including worker and community health and safety in the project's area of influence), in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, trans-boundary, and cumulative impacts as appropriate.

F. Analysis of Alternatives
This section examines alternatives to the proposed project site, technology, design, and operation—including the no project alternative—in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. It also states the basis for selecting the particular project design proposed and, justifies recommended emission levels and approaches to pollution prevention and abatement.

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

method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

H. Grievance Redress Mechanism

This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental and social performance. This should be based on traditional conflict resolution or custom processes as much as possible and form part of the GRM for the overall program as set out in the PSA and LARP.

I. Environmental Management Plan

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

(i) Mitigation: (a) identifies and summarizes anticipated significant adverse environmental and social impacts and risks; (b) describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and (c) provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.

(ii) Monitoring: (a) describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and (b) describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.

(iii) Implementation arrangements: (a) specifies the implementation schedule showing phasing and coordination with overall project implementation; (b) describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures; (c) identification of measures to strengthen environmental and social management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and (d) estimates capital and recurrent costs and describes sources of funds for implementing the environmental and social management plan.

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

J. Conclusion and Recommendation

This section provides the conclusions drawn from the assessment, including whether any further and more detailed assessment is required, and provides recommendations.