

Environmental and Social Considerations in Detailed Planning Survey
(Technical Cooperation for Developing Planning)

1. Full Title of the Project:

The Project for the Planning of the Nadi River Flood Control Structures.

2. Type of the study:

Master Plan and Feasibility Study.

3. Categorization and its reason:

Categorization: Category B.

Reason: The project is not considered to be a large-scale river and sand erosion control project, is not located in a sensitive area, and has none of the sensitive characteristics under the JICA guidelines for environmental and social considerations (April 2010), it is not likely to have a significant adverse impact on the environment.

4. Agency or institution responsible for the implementation of the project:

Land and Water Resources Management Division (LWRM), Ministry of Agriculture (MOA) is designated as the technical focal point for the Project.

5. Outline of the Project(objectives, justification, location, proposed activities, and scope to the study):

5-1. Objectives

Expected Goals which will be attained after the Project Completion are as follows:

(1) Goal of the Proposed Plan

The Master Plan and the results of Feasibility Study will be approved by GOF.

(2) Goal which will be attained by utilizing the Proposed Plan

Flood damage in the Nadi River Basin will be mitigated.

5-2. Justification

In the development survey by JICA, "The Study on Watershed Management and Flood Control for the Four Major Viti Levu Rivers in the Republic of Fiji Islands" in 1996 to 1998, the target scale of the flood control of Nadi River was 20-year return period for short term plan and 50-year return period for long term plan. Together with the economic development of the target area in these 16 years, Land utilization and asset situation have greatly changed as well as the target flood, especially the target amount of rainfall and its spatial distribution, have drastically changed from the development survey by JICA.

Therefore, it is necessary and important to reformulate the Master Plan for flood management that takes into consideration the actual recent flood damage situation.

5-3. Location

Nadi River Basin.

5-4. Scope to the Study

The outputs of the Project are as follows:

- (1) The Master Plan of the flood management of the Nadi River Basin;
- (2) The Feasibility Study on urgent and/or priority project(s); and
- (3) Technical Transfer to relevant personnel of GOF through the Project.

5-5. Activities

The Project will be carried out in the following three (3) stages step-by-step together with technical transfer during the entire period:

Stage-1: Basic Study (To consolidate basic information/data).

- 1-1 Review of existing data, documents and information
- 1-2 Collection and arrangement of basic data and information
- 1-3 Evaluation of existing flood control plan and activity
- 1-4 River topography surveying (longitudinal, cross), beach topography surveying (bathymetry, shoreline)
- 1-5 Investigation of riverbed materials, sediment discharge
- 1-6 Investigation of beach profile change, current, sand drift, sea bed material
- 1-7 Investigation of flood damage, wave overtopping damage, coastal erosion damage
- 1-8 Rainfall analysis, study of rainfall return period
- 1-9 Preliminary run-off analysis and flood inundation analysis
- 1-10 Preliminary analysis of beach profile change
- 1-11 Set of target return period
- 1-12 Investigation of river facilities and coastal facilities
- 1-13 Proposal of design criteria
- 1-14 Estimation of sediment transportation (sediment discharge, alongshore sediment transport)
- 1-15 Proposal of evaluation criteria for flood management plan
- 1-16 Preliminary study for flood management plan
- 1-17 Preliminary Environmental Examination for each option
- 1-18 Research and proposal for implementation of project / operation and maintenance management framework
- 1-19 Evaluation of Preliminary study for flood management plan
- 1-20 Supporting of public consultation

Stage-2: Master Plan Study (To formulate a Master Plan of the flood management of the Nadi River Basin).

- 2-1 Collection and arrangement of additional data and information
- 2-2 Comparison of alternatives considering environmental and social considerations
- 2-3 Prediction and evaluation of major environmental and social impact items, and planning of mitigation measures and monitoring
- 2-4 Additional investigation of river facilities and coastal facilities
- 2-5 Run-off analysis and flood inundation analysis
- 2-6 River bed variation analysis
- 2-7 Beach profile change analysis
- 2-8 Geotechnical investigation
- 2-9 Preliminary design of proposed structural measures
- 2-10 Evaluation of existing non-structural measures
- 2-11 Evaluation and proposal of non-structural measures
- 2-12 Formulation of the Master Plan
- 2-13 Selection of priority project(s)
- 2-14 Pre-Environmental Impact Assessment based on selected priority project(s)
- 2-15 Assistance for making of initial resettlement plan
- 2-16 Supporting of public consultation
- 2-17 Proposal of project scope

Stage-3: Feasibility Study (To conduct a Feasibility Study on urgent and/or priority project(s)).

- 3-1 Implementation of the Feasibility Study
- 3-2 Suggestions for improvement related to disaster risk reduction and disaster risk management

Entire Period: Technical Transfer (To undertake Technical Transfer to relevant personnel of Government of Fiji through on-the-job training in the Project as well as seminars, workshops, and counterpart training).

- 4-1 On-the-job Training through the Project
- 4-2 Technical seminars and workshops related to the Project
- 4-3 Related training courses in Japan for counterpart personnel

6. Description of the Project Site (Environmental and social condition, current issues, etc.):

6-1. Environmental and Social Condition

Nadi Town, third largest city of Fiji with the population of around 45,000, is located in the west of Viti Levu Island. Nadi Town is the commercial and sightseeing center of Fiji, not only because of the traditional primary industry like sugar cane but also because of the prospering tourist business mainly in Denarau, which over 600 thousand tourists visit every year, and Nadi International Airport is in this town.

6-2. Current Issues

Nadi River Basin has suffered from inundation damage due to the frequent cyclones attacking in the rainy season (from November to April) and heavy rains. This damage exerts serious influence on the socio and economic development of this area. Floods happened in January 2009, January and March 2012 caused tremendous damage on Nadi Town and its suburbs. Especially in the flood of January and March 2012, most of Nadi Town, including the runways of the airport, was inundated and thereby caused the damage of 89 million US dollars.

6-3. Climate Change

The sea-level rise is leading to coastal erosion. With the majority of villages and settlements in Viti Levu located along the coast, there is a noticeable infiltration of the sea into the village compound during high tide. The increase in the frequency and intensity of tropical cyclones over the past decade is fueling coastal inundation and erosion. Intensive urban development along the coast, as well as deforestation of catchments has also contributed to exposing large coastal areas to flooding and erosion.

(Source: Roadmap for Democracy and Sustainable Socio-Economic Development, 2010-2014., page119~120, Ministry of National Planning)

7. Legal Framework of Environmental and Social Considerations

7-1.Laws, regulations and standards related to environmental and social issues including requirements and procedures of Environmental Impact Assessment (EIA), stakeholder participation, and information disclosure.

(1) Laws, regulations and standards

Fiji has enforced the Environment Management Act (EMA) 2005. There are two Regulations that were formulated with this Act. They are the Environment Management (EIA Process) Regulations 2007 and the Environment Management (Waste) Disposal Regulations 2007. The Environment Management (EIA Process) Regulations and the Environment Management (Waste) Disposal Regulations 2007 came into force on 1st January 2008 & 1st January 2009 respectively.

(2) Requirements of EIA

The EIA Regulations provide details information on Part 4 of the EMA 2005 which sets out the framework for the Environment Impact Assessment process which must be applied to most proposals for development activities or undertaking before they can be approved.

Schedule 2 - Part 1 of EMA 2005 clearly indicates conditions which types of development would require an EIA.

(3) Procedures of EIA

A brief procedure of EIA is as follows;

- 1) A proponent applies to either Department of Environment (DOE) in SUVU or DOE Western Division Office in LAUTOKA under Ministry of Local Government, Urban development, Housing and Environment. The authority receives the application, and decides whether EIA is required or not based on the screening.
- 2) If EIA is required, a proponent studies contents of the study (draft) and submits to DOE. A draft TOR (Term of reference) for EIA Study is checked by DOE, and final TOR is provided to a proponent.
- 3) A proponent implements EIA and prepares a draft EIA report.
- 4) The draft EIA report is opened to the public, and a public consultation is held.
- 5) The draft EIA report is reviewed by technical officers. Based on the reviewing by the technical officers, additional study is conducted, if necessary, and the report is approved (or rejected).

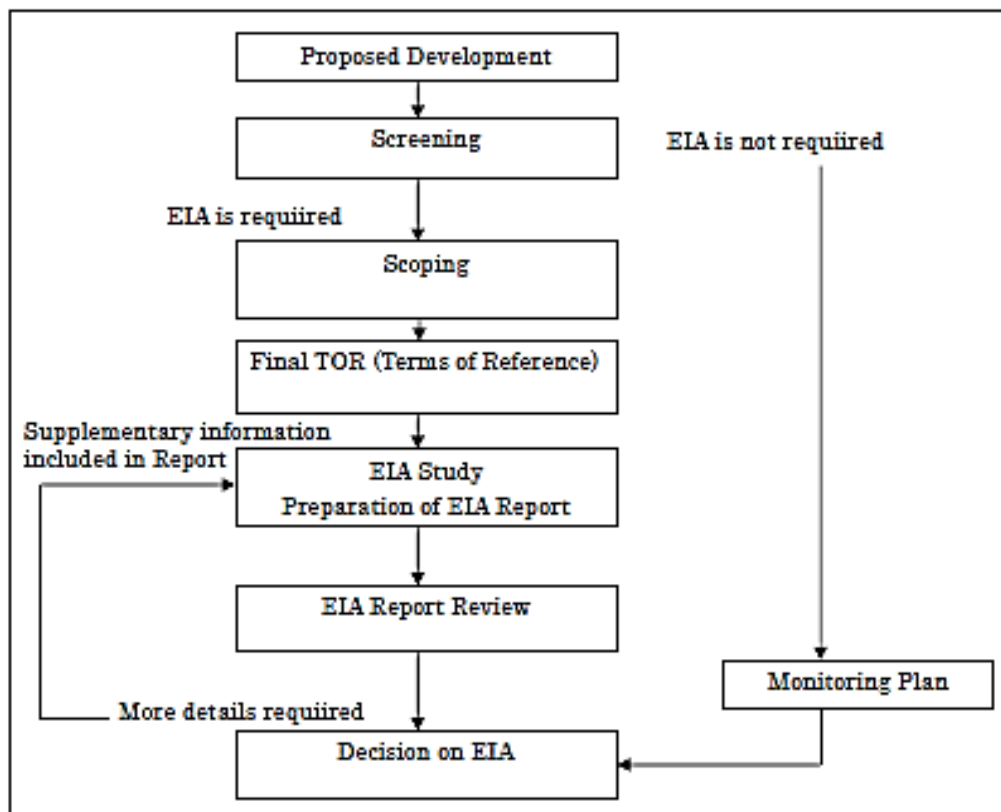


Figure 1 EIA Process
(Source: Department of Environment)

(4) Stakeholder Participation

According to the “Environmental Impact Assessment Guidelines” prepared and published by the DOE in Fiji, outline of public participation is as follows; All EIA reports are public information and are to be made available for review at any time, via the Environmental Register and particularly 21 days after submission for major

developments, public notice is to be given in newspapers and radio. A public hearing must also take place, in the vicinity of the area of the proposed development. The processing authority may directly seek input from stakeholders, particularly other Ministries, departments or NGO's.

(5) Information Disclosure

According to the “Environmental Impact Assessment Guidelines” prepared and published by the DOE in Fiji, outline of public participation is as follows:

All EIA reports are public information and are to be made available for review at any time, via the Environmental Register.

7-2 Relative agencies and institutions.

Department of Environment (DOE) under the Ministry of Local Government, Urban development, Housing and Environment plays the major role in environment policy in Fiji. As of February 2014, there are fifteen permanent staffs in the department.

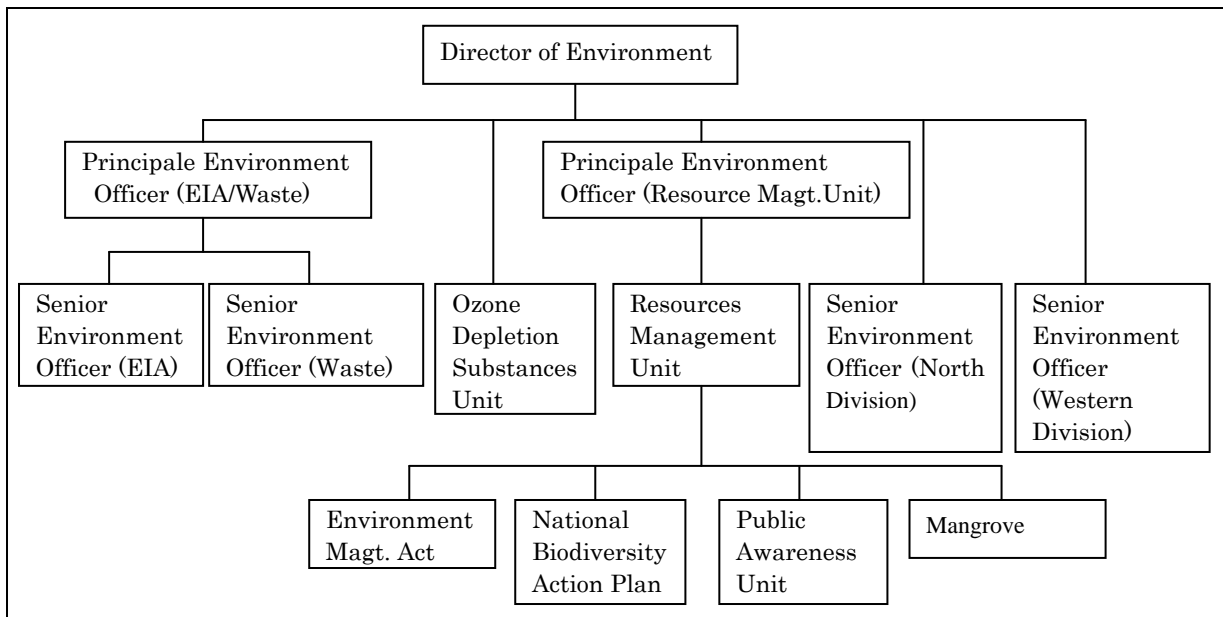


Figure 2 Organization Structure of DOE
(Source: Department of Environment)

8. Provisional Scoping (types and magnitudes of possible adverse impacts and mitigation measures)

Provisional comparison of each option is as following table.

Table 1 Comparison of Each Option

	Flood Control Dam	Flood Control Basin	River Improvement (Embankment)	River Improvement (Widening River)	Ring Embankment	Diversion Channel
Pollution Control						
(1) Water Quality	Negative impact is not likely to occur since river flow is secured.	Needs to be confirmed in the course of the Project.	Possible water pollution due to inflow of excavated soil and sand during construction period.	Same as mentioned left.	Need to be confirmed in the course of the Project.	Possible increase of turbidity due to inflow of Nadi river water to Nadi Bay.
(2) Wastes	Possible generation of cut trees.	Needs to be confirmed in the course of the Project.	Same as mentioned left.	Possible generation of soil and sand during construction period.	Needs to be confirmed in the course of the Project.	Possible generation of soil and sand during construction period.
(3) Subsidence	Needs to be confirmed in the course of the Project.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.
Natural Environment						
(1) Protected Areas	There is no reserved area on the lower Vaturu Dam.	There is no National Park and protected area.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.
(2) Ecosystem	Nadi river and its tributary are habitats for fishes and other fauna. Structure such as dam obstructs	Needs to be confirmed in the course of the Project.	Nadi river and its tributary are habitats for fishes and other fauna.	Nadi river and its tributary are habitats for fishes and other fauna.	Need to be confirmed in the course of the Project.	No direct negative impact is expected since Land use is residential, commercial and

	Flood Control Dam	Flood Control Basin	River Improvement (Embankment)	River Improvement (Widening River)	Ring Embankment	Diversion Channel
	fish migration. Wild boars are likely to be hunted.					farm use. However, careful consideration is necessary to mangrove areas in river mouth since river flow of Nadi is changed.
(3) Hydrology	Need to confirm the possible negative impact in the course of the Project.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.
(4) Topography and Geology	Farmland, shrub, grassland, extends along the river side.	Farmland extends around village.	Farmland extends along the river side. Main farming style is sugarcane growing.	Same as mentioned left.	Mainly commercial area.	Mixed with residential area and commercial area.
Social Environment						
(1) Resettlement	Study and consultation is needed whether Land is able to obtain. In case, resettlement is expected, an approximate number needs to be confirmed.	Same as mentioned left.	Study and consultation is needed whether Land is able to obtain. In case, resettlement is expected, an approximate number needs to be confirmed.	Study and consultation is needed whether Land is able to obtain. In case, resettlement is expected, an approximate number needs to be confirmed.	Study and consultation is needed whether Land is able to obtain. In case, resettlement is expected, an approximate number needs to be confirmed.	According to some information, about 60 households likely exist.

	Flood Control Dam	Flood Control Basin	River Improvement (Embankment)	River Improvement (Widening River)	Ring Embankment	Diversion Channel
(2) Living and Livelihood	Cassava and vegetables are mainly grown for own consumption.	Needs to be confirmed in the course of the Project.	Fishes caught in the river are likely the source of protein for community people.	Same as mentioned left.	There are shops mainly managed by Indian.	There i Taukei and Indian and others.
(3) Heritage	There is no cultural heritage designated by the country's law along the river. However, according to the Nadi Basin Catchment Committee, village itself may be considered as a heritage in Fiji.	There is no cultural heritage designated by the country's law. However, according to the Nadi Basin Catchment Committee, village itself may be considered as a heritage in Fiji.	Needs to be confirmed in the course of the Project.	Needs to be confirmed in the course of the Project.	There are Churches, Temples and Mosques.	There is a Crematorium at left side along the shore line of the Nadi Bay.
(4) Landscape	Needs to be confirmed in the course of the Project.	Same as mentioned left.	There are Elephant grass and Castor plant at water side . These two species are thought to protect erosion.	There are Elephant grass and Castor plant at water side . These two species are thought to protect erosion.	Needs to be confirmed in the course of the Project.	Diversion Channel goes to the Nadi Bay. Development for resort area is in progress in Nadi Bay.
(5) Ethnic Minorities and Indigenous Peoples	Needs to be confirmed in the course of the Project.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.

	Flood Control Dam	Flood Control Basin	River Improvement (Embankment)	River Improvement (Widening River)	Ring Embankment	Diversion Channel
(6) Working Conditions	Needs to be confirmed in the course of the Project.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.
Others						
(1) Impacts during Construction	Extent of impacts and its measurements need to be confirmed since negative impacts on noise, vibrations, turbid water, dust, exhaust gases, and wastes are expected.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.
(2) Monitoring	Needs to be confirmed.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.
Note						
Climate Change Adaptation	Need to be considered in the course of the Project.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.	Same as mentioned left.

9. Alternatives to the project activities including ‘without project’option.

Alternatives to the project activities including ‘without project’option will be studied at Master Plan Study (Stage - 2: 2-2 Comparison of alternatives considering environmental and social considerations) .

10. Result of the consultation with recipient government on environmental and social considerations including roles and responsibilities:

The Detailed Planning Survey Team explained ‘JICA Guidelines for Environmental and Social Considerations, April 2010’, and it shall be applied to the Project. The Fiji side understood the basic principles of the JICA’s guidelines and agreed as follows:

- (1) The Fiji side will follow the EIA process in Fiji for project activities and take appropriate measures;
- (2) The information disclosure shall be made in order to ensure the participation and dialogues with stakeholders in order to achieve appropriate environmental and social considerations; and
- (3) In the course of the Project, public consultation with local communities shall be included.

11. Other relevant information:

Joint Coordinating Committee will be held in order to facilitate inter-organizational coordination. JCC will be held whenever deems it necessary.

End