Date: 26 June 2016

Environmental and Social Considerations in Detailed Planning Survey

（Technical Cooperation for Development Planning）

1. Full title of the Project

The Project for Formulation of National Power System Development Master Plan Study in the Republic of Mozambique

2. Type of the study (e.g. Master Plan, Feasibility Study, Detailed Design, etc.)

Master Plan

3. Categorization and its reason

The Study is classified as a "Category B" because the Project is not likely to have significant adverse impact on the environment under the JICA Guidelines for Environmental and Social Considerations (April, 2010) in terms of its sectors, characteristics and areas.

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

Electricidade de Mozambique (EDM)

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

The outline of the project is as follows:

1. Expected Goals which will be attained after the Project Completion

(1) Project purpose

(2) Overall Goal of the Project

2. Outputs

The major outputs of the Project are;

3. Activities

(1)

6. Description of the project site (maps, environmental and social condition, current issues, etc.)

The project site is entire Mozambique.

Mozambique is located on the south-eastern seaboard on the African continent. The country shares its northern borders with Tanzania, Malawi, and Zambia, the western and Zimbabwe and the

southern with Swaziland and South Africa. The land covers about 799000 km^2.

Source: The World Factbook, Central Intelligence Agency

Figure 1. Mozambique

(1) Socio Economic Conditions

The population of Mozambique is estimated to be about 27 million people in 2015 with average population growth rate of 2.5% per year between 2010 and 2015. The capital city, Maputo, has about 10% of the nation's population, although the rate of urbanization is low compared to other African countries.

In 2014, Mozambique's GDP per capita was 624USD with 7.2% of economic growth rate. Major industries are agriculture (maize, sugar, cashew nuts, etc.), fishery (shrimps), and mining (aluminum, coal, natural gas, etc,) Along with agriculture; transportation/communication and trading makes the basis of the country's economic activities.

After the independence in 1975 until the end of the civil war in 1992, about one million land mines were planted. This hindered the country's socio-economic development even after the war.

However, in September 2015, the country declared that the removal of land mines was completed.

(2) Natural Conditions

The climate of Mozambique is mainly subtropical. It has a rainy season (September to April) and dry season (May to August). The average monthly temperatures range between 27 °C and 20 °C. The annual precipitation is about 900mm.

The Zambezi River crosses the land of Mozambique in the middle. The northern part of the country consists of highlands, while the southern part is with hills and lowlands. The coastal area has many rivers with downstream plains. The highest point is Mount Binga (2436m) by the Zimbabwe border, followed by Mount Namuli (2419m) in the north

The vegetation of Mozambique is characterized as coastal mangrove and coastal mosaic along the coast and mionbo and mopane vegetation of the inland area. The country has variety of ecosystems, such as. the East African Coastal Forests, Maputaland- Pondoland Dry Forests, Zambezian Woodlands & Savannas, Zambezian Flooded Savannas, Zambezian Montane Savannas & Woodlands, Rift Valley Lakes, East African Mangroves, East African Marine Ecosystems, and Agulhas Current Marine Ecosystems.

There are two Ramsar Sites in the country, namely Niassa Lake area and Maromeu area. There are 45 nationally protected areas, covering 16% of the country's land. Out of which 16 areas are listed as IUCN protected areas of different categories.

In terms of fauna and flora, it is reported that Mozambique has about 5,500 plant species, out of which 250 are endemic, and 4,271 animal species. According to IUCN Red List (2015), there are 188 threatened animal species, with 11 critically endangered, 41 endangered and 136 vulnerable species. Eighty four plant species are listed, with 4 critically endangered, 25 endangered and 55 vulnerable species. The list also reported that among the representative orders, there are 2 endemic plant species and 1 mammal species.

7. Legal Framework of Environmental and Social Considerations

(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.

Table 1 is a list of policies, laws and regulations related to environmental and social issues in

Mozambique

Table 1 Laws, Regulations and Standards Related to Environmental and Social Issues

Category	Name
Policy	National Environmental Policy (No. 5/1995)
Law	Environmental Law (Law No. 20/1997)
	Land Law (Law No. 19/1997)
	Forest and Wildlife Law (Law No. 10/1999)
	Biodiversity Conservation Law (Law No. 16/2014)
	Law for Protection of Cultural Assess (Law No. 10/1988)
Regulations	Regulations for Environmental Impact Assessment (Decree No.54/2015)
	Regulations on the Environmental Audit Process (Decrees No. 25/2011)
	Regulations for Environmental Inspections (Decree No. 11/2006)
	Regulations for Environmental Quality Standards and Effluent Emissions (Decree No. 18/2004, amended by Decree No. 67/2010)
	Regulations for the Management of Urban Solid Waste (Decree No. 94/2014)
	Regulations for the Management of Hazardous Waste (Decree No. 83/2014)
	Regulations for the Forest and Wildlife Law (Decree No. 12/2002)
	Regulations for the Resettlement Process Resulting from Economic Activities (Decree No. 31/2012)

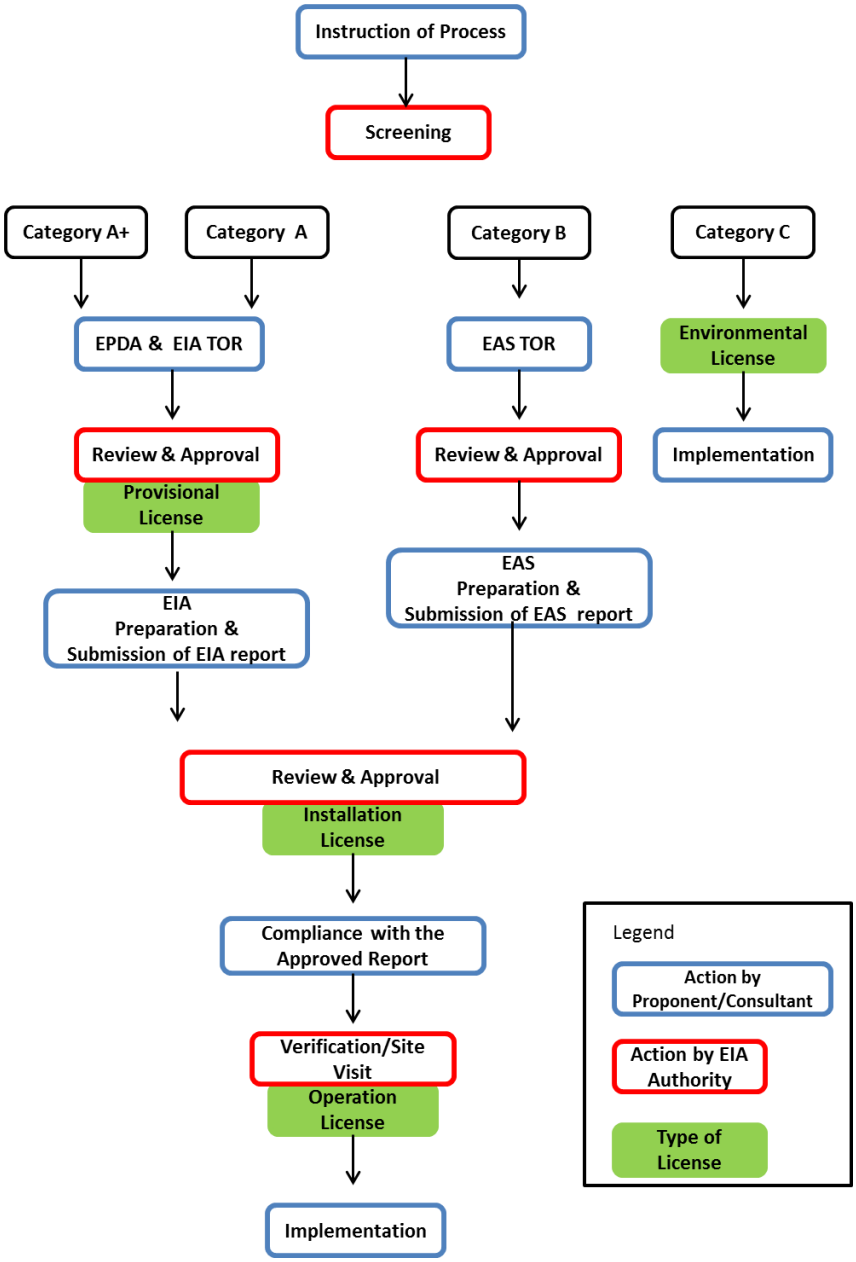
The Regulations for EIA (Decree No.54/2015), came in force in March, 2015, set out the EIA system and procedure of Mozambique. Under this system, projects listed in Annex 1 to 4 of the Regulations for EIA categorized as ones required to carry out full a-fledged EIA (Category A+/A) or a simplified environmental assessment (Category B), or ones not required further assessment (Category C).

The detailed process of the EIA system is described in the Regulations for EIA. Public participations and information disclosure are required at the different stages of the environmental assessment procedure of category A+, A and B projects. The method of stakeholder meetings and disclosure is also described under Article 15 of the Regulations.

In Mozambique, it requires environmental s to be conducted and relevant documents to be prepared only by experts or firms whose names and qualifications are registered by National Directorate of Environment under the Ministry of Land, Environment and Rural Development

Figure 2 is the flowchart of the EIA procedure of Mozambique.

Figure 2 Flowchart of EIA Procedure



Source: JICA Study Team

In Mozambique, presently the first draft of law concerning SEA is under review, hence, there is no law or/and regulations concerning Strategic Environmental Assessments (SEA) in force.

In terms of land acquisition and resettlement, the followings are most relevant.

- Land Law (Law No.19/1997) stipulates the State's ownership of all land and right of land

use by all Mozambicans citizens (Article 1 and 3). Article 17 stipulates exploitation of land for public purpose.

- Regulations on Safety of High Tension Electric Line (Decree No.57/2011) sets out the ROW of the transmission lines According to EDM, ROW for 110kV line is 21to 30m and 46to 50m for 220kV.
- Regulations for the Resettlement Process Resulting from Economic Activities (Decree No. 31/2012) establishes the process of resettlement. Preparation of Resettlement Action Plan is considered as a process of environmental assessment procedure and the plan must be prepared and authorized before obtaining environmental licenses. Public participation is required during planning and implementation of resettlement and resettlement plan must be disclosed to public.

According to EDM and MITADER if there are items that are not established under national legal framework concerning environmental assessment and land acquisition and resettlement, the relevant safeguard policies of the World Bank will be referred as benchmark, hence there is no major gap between the national legislation and the World Bank's safeguards policies in terms of environmental and social considerations.

The following table shows the major differences between the JICA Guidelines for Environmental and Social Considerations (April, 2010) and relevant legislation in Mozambique

Table 2. Comparison of the JICA Guidelines and relevant legislation in Mozambique

Item	JICA Guidelines	Legislation in Mozambique
Information disclosure	・EIA report is disclosed to all stakeholders and locals and on JICA's website.	・Under Article 15 of the EIA regulations, EIA report and other relevant documents become public documents.

Item	JICA Guidelines	Legislation in Mozambique
Public participation	・Project proponents are encouraged to disclose information about their projects and consult with local communities and stakeholders (especially those directly affected). ・In the case of Category A projects, JICA encourages project proponents to consult with local stakeholders about their understanding of development needs, the likely adverse impacts on the environment and society, and the analysis of alternatives at an early stage of the project. ・In case of Category A projects, public consultations must be held twice; during scoping process and during preparation of EIA report. In case of Category B projects, consultations should be held when necessary.	・Article 15 of the EIA regulations stipulates process of public participation throughout the preparation of EIA report. ・Public participation is mandatory for all Category A+, A and B projects and must be held during scoping process and during preparation of EIA report. ・The announcement of holding public consultation must be made 15 days prior to the consultation and all stakeholders must be invited for their opinions.
Resettlement	・For projects that will result in large-scale involuntary resettlement, a Resettlement Action Plan (RAP) also must be prepared and disclosed. ・It is desirable that the resettlement action plan include elements laid out in the World Bank Safeguard Policy, OP 4.12, Annex A.	・Article 15 of the Regulations for the Resettlement Process Resulting from Economic Activities states that the preparation and approval of a Resettlement Plan precedes the issue of an environmental license under the environmental legislation. ・Article 19 to 23 of the above regulations stipulate items to be covered in a Resettlement Plan. Most of the items in the World Bank Safeguard Policy are covered under the Articles.

Item	JICA Guidelines	Legislation in Mozambique
Mitigation measures	・Multiple alternatives must be examined in order to avoid or minimize adverse impacts and to choose better project options. ・In the examination of measures, priority is to be given to avoidance of environmental impacts; when this is not possible, minimization and reduction of impacts must be considered next. ・Compensation measures must be examined only when impacts cannot be avoided by any of the aforementioned measures. ・Appropriate follow-up plans and systems, such as monitoring plans and environmental management plans, must be prepared including the implementation costs and the financial methods to fund such costs. Plans for projects with particularly large potential adverse impacts must be accompanied by detailed environmental management plans.	・There is no specific policy on examination of mitigation measures. ・Article 11 and 12 of the EIA regulations provides that an environmental management plan (including mitigation measures, impact monitoring, environmental education, accident prevention and emergency measures) must be included in EIA report. ・Article 25 of the EIA regulations states that for Category A+, A and B projects, project proponents are responsible for periodic inspection and audit and must make sure the EMP are properly implemented.

(2) Relative agencies and institutions

Environmental and Social Department under EDM

Environmental and Social Department of EDM provides environmental and social assessment support for foreign and locally funded projects implemented by EDM. The functions includes conducting assessments for environmental, social impact and land acquisition, preparing relevant environmental assessment documents/reports and RAP, their implementation and conducting monitoring.

National Directorate of Environment, Ministry of Land, Environment and Rural Development (MITADER): Responsible for overseeing the environmental assessment procedure and reviewing documents/reports relevant to environmental assessment and issuing environmental licenses.

SEA Unit, Department of Monitoring and Evaluation, National Directorate of Planning and Cooperation, Ministry of Land, Environment and Rural Development (MITADER): Responsible for overseeing the SEA procedure and providing advices, including coordination of public participation and stakeholder involvement, liaising with relevant authorities, and reviewing documents/report relevant to SEA. In the absence of legal framework for SEA, this unit will provide the guidance on the SEA procedure.

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

Provisional scoping was carried out based on possible project types (e.g. thermal power generation, hydro power generation, renewable energy (“RE”) and transmission line) as result of implementation of the National Power System Master Plan. Impacted items, selected based on the JICA Guidelines for Environmental and Social Considerations, are examined against impact factors. Each impact is evaluated whether if it is positive or adverse and also examined its possible extents and severities. Table 3 is the result of the scoping. However, since actual projects and their descriptions are not formulated at this stage, many impacts are evaluated as unknown.

Table 3: Provisional Scoping and Possible Impacts

Category	Environmental Item	Evaluation		Explanation on impacts	Individual evaluation (Before and during construction /			
		Before and during constructio	Operation and maintenance		Thermal power	Hydro power	RE	TL
Pollution Control	Air quality	B-	B-	**During construction:** Some adverse impacts are expected due to emission of air pollutants by heavy machinery and vehicles. **Operation and maintenance (O/M):** From thermal power plants, pollutants are emitted.	B-/B-	B-/D	B-/D	B-/D
	Water quality	A-	B-	**During construction:** Water contamination is expected during the construction of offshore gas and oil terminal. Construction works near water bodies may affect water quality in the area if proper measures are not in place. **O/M:** Ash dumping sites and coal stock yards of coal-fired thermal power plants need to be appropriately managed. Hydro power generation by dam and other types of generation may affect water quality, if proper measures are not in place. Impacts induced by the operation of offshore gas and oil terminal are unknown**.**	A-/B-	B-/B-	B-/C	B-/D
	Wastes	B-	B-	**During construction:** Some adverse impacts are expected. **O/M:** Ashes from coal-fired thermal power plants need to be appropriately managed.	B-/B-	B-/D	B-/D	B-/D

Category	Environmental Item	Evaluation		Explanation on impacts	Individual evaluation (Before and during construction /			
		Before and during constructio	Operation and maintenance		Thermal power	Hydro power	RE	TL
Pollution Control	Soil contamination	B-	B-	**During construction**: Some adverse impacts are expected. **O/M**: Ash dumping sites of coal fired thermal power plants need to be appropriately managed. Use of insulating oils at substations and power plants may cause soil contamination, if proper measures are not in place.	B-/B-	B-/B-	B-/D	B-/D
	Noise and vibration	B-	B-	**During construction:** Some adverse impacts are expected. **O/M:** Noise from generation plants and substations, and low-frequency noise from wind turbines are expected.	B-/B-	B-/B-	B-/B-	B-/D
	Subsidence	C	C	Impacts are unknown. If projects require a large amount of ground water, it may trigger subsidence.	C/C	C/C	C/C	D/D
	Odor	B-	B-	**During construction:** Some adverse impacts are expected. **O/M**: Thermal generation plants may cause some odor.	B-/B-	B-/D	B-/D	B-/D
	Sediment	A-	A-	**During construction:** Impacts to the sediments are expected during the construction of offshore gas and oil terminal, LNG terminal and hydro generation plant Some adverse impacts are expected during the construction of thermal power plants and hydro power plants. **O/M**: Hydro power generation plants may affect sediment.	A-/D	A-/A-	C/D	D/D
	Protected areas	C	C	Impacts are unknown as location of each project is unknown at this stage.	C/C	C/C	C/C	C/C

Category	Environmental Item	Evaluation		Explanation on impacts	Individual evaluation (Before and during construction /			
		Before and during constructio	Operation and maintenance		Thermal power	Hydro power	RE	TL
Natural Environment	Ecosystem	A-	A-	**During construction and O/M:** Hydro power generation projects with dam may affect ecosystem around the project site. Other project types may affect depending on their locations.	C/C	A-/A-	C/C	C/C
Natural Environment	Hydrology	A-	A-	**During construction:** Some adverse impacts are expected during the construction of hydro power plants. Impacts by other modes of generation are unknown. **O/M:** Reservoir of hydro power plant could give some adverse impacts to nearby water system. Impacts by geothermal plants are possible.	C/D	A-/A-	B-/ B-orA-	D/D
Natural Environment	Ground water	A-	A-	**During construction and O/M:** Hydro power generation projects and geothermal generation projects may affect ground water. Other generation projects that require use of ground water may affect the ground water, although impacts are unknown at this stage.	C/C	A-/A-	B-/ B-orA	C/D
Natural Environment	Topography and geology	C	D	**During construction:** I mpacts are unknown at this stage.	C/D	C/C	C/D	C/D
Natural Environment	Land erosion	C	D	Impacts may occur depending on location and design of projects, although it is unknown at this stage.	C/D	C/C	C/D	C/D
Natural Environment	Climate	C	C	Impacts are unknown.	C/C	C/C	C/D	C/D

Category	Environmental Item	Evaluation		Explanation on impacts	Individual evaluation (Before and during construction /			
		Before and during constructio	Operation and maintenance		Thermal power	Hydro power	RE	TL
Social Environment	Involuntary resettlement	B- or A-	D	**Before construction:** Projects may require resettlement of people within project site, e.g. the Right of Way. Severity of the impacts will depend on the density of structures within proposed project sites.	B-or A-/D	B-or A-/D	B-or A-/D	B-or A-/D
Social Environment	Poor and indigenous peoples, gender, children's rights	C	C	Impacts are unknown at this stage.	C/C	C/C	C/C	C/C
Social Environment	Living and livelihood	B-	B+	**During construction:** Due to the interruption of the power supply that may occur during construction and traffic control around project sites, accesses to public and commercial facilities may be limited and living and economic activities may be hampered, although temporarily. **O/M:** Improvement of power system will lead to stable and extended power supply which is expected to contribute largely to improvement of living conditions and livelihood in general.	B-/B+	B-/B+	B-/B+	B-/B+
Social Environment	Utilization of land and local resources	B-	C	**Before and during construction:** Where land is acquired for projects, type of land utilization may be changed, although impacts are unknown. **O/M:** Impacts are unknown.	B-/C	B-/C	B-/C	B-/C

Category	Environmental Item	Evaluation		Explanation on impacts	Individual evaluation (Before and during construction /			
		Before and during constructio	Operation and maintenance		Thermal power	Hydro power	RE	TL
Social Environment	Water Right/Common	B-	B-	**During construction:** General construction works require use of water and it may affect water right temporarily. Construction of hydro power generation projects, they may affect water right/common. **O/M:** Although necessary considerations are given to water utilization, impacts from thermal and hydro power plants are expected.	B-/B-	B-/B-	B-/C	B-/D
	Existing social infrastructures and services	B-	B+	**During construction:** Temporal power failures are expected during the construction work. Traffic congestions, limited access to existing infrastructures and services are also expected due to the traffic control during the work. **O/M:** Improvement of power system will lead to stable and extended power supply which is expected to contribute largely to improvement of social infrastructures and services.	B-/B+	B-/B+	B-/B+	B-/B+
	Social institutions such as social infrastructure and local decision-making	C	C	Impacts are unknown at this stage; however they are less likely to occur.	C/C	C/C	C/C	C/C

Category	Environmental Item	Evaluation		Explanation on impacts	Individual evaluation (Before and during construction /			
		Before and during constructio	Operation and maintenance		Thermal power	Hydro power	RE	TL
Social Environment	Misdistribution of benefits and damages	B-	C	**During construction:** Employment opportunity for hiring locals for construction work may not be equal. Benefit and losses for business and economic activities around the construction site may not be equal **O/M:** Impacts are unknown.	B-/C	B-/C	B-/C	B-/C
	Local conflicts of interest	C	C	Impacts are unknown.	C/C	C/C	C/C	C/D
	Cultural heritages	C	C	Impacts are unknown at this stage. If heritage or culturally/historically important sites are present within projects sites, they may be affected.	C/C	C/C	C/C	C/C
	Landscape	B-	B-	**During construction:** Some adverse impacts are expected. **O/M:** Presence of constructed structures may affect surrounding landscap	B-/B-	B-/B-	B-/B-	B-/B-
	Infectious diseases such as HIV/AIDS	B-	D	**During construction:** Although unknown, impacts may occur due to the influx of construction workers from the outside of communities.	B-/D	B-/D	B-/D	B-/D
	Labor conditions	B-	B-	**During construction and O/M:** Without a proper management, labor conditions and safety of workers may not be ensured.	B-/B-	B-/B-	B-/B-	B-/B-

Category	Environmental Item	Evaluation		Explanation on impacts	Individual evaluation (Before and during construction /			
		Before and during constructio	Operation and maintenance		Thermal power	Hydro power	RE	TL
Others	Accidents	B-	B-	**During construction and O/M:** There are risks of accidents related to construction works as well as operation and maintenance of facilities.	B-/B-	B-/B-	B-/B-	B-/B-
Others	Global warming	B-	B-	**During construction:** During construction, emission of GHG by heavy machinery and vehicles is expected. **O/M:** Power generation plants (thermal, coal, natural gas) may emit GHG if proper mitigation measures are not in place.	B-/B-	B-/B-	B-/D	B-/D

+: Positive impact. -: Adverse impact.

A: Significant impact is expected. B: Some impact is expected. C: Impact is unknown Further study is needed. D: No impact is expected.

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

Since the study is to formulate National Power System Master Plan in Mozambique, at this stage, there is no alternative plan except “without project” option. Alternative scenarios will be analyzed during the process of Master Plan formulation.

In comparison to the “without project” option, implementing this project is highly beneficial, especially in terms of positive impacts on both natural and social environments. By implementing the project, SEA will be conducted to assess environmental impacts of each case scenario, so that the development in the power sector could be more sustainable and strategic. The power supply in Mozambique will be expected to be expanded and stabilized by implementing the Master Plan. This enables to meet the supply demands leading to promotion of economic activities as well as improving living conditions of general public and social services. On the other hands, if this project is not implemented, the power supply will not be able to meet the increasing demands in the country. This will hamper the expected development of economic activities and improvement of living conditions.

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

Environmental and Social Department of EDM which is responsible for overseeing environmental and social considerations of EDM projects, has worked with international donors such as JICA, AfDB, and WB and is aware that the roles and responsibilities of its own and other governmental agencies on this matter.

11. Terms of Reference for Environmental and Social Considerations

During the process of formulating National Power System Master Plan, Strategic Environmental Assessment should be carried out in accordance with JICA Guidelines as well as the legislations of the country. Since, presently in Mozambique, legal framework for SEA is under preparation process, but not yet finalized, it is advisable to communicate closely with the SEA unit under MITADER for their guidance on SEA procedure. It is also necessary to provide some capacity development activities relating SEA for the Environmental and Social Department and decision makers of EDM as well as other authorities involved in the National Power System Master Plan activities so that the experience will be applied to other master planning activities in future.

Terms of Reference for the Study include, but not limited to, the followings.
Supporting and collaborating with EDM and SEA team to carry out SEA in accordance with JICA Guidelines and the relevant legislations of the country. For examples;

- Establishing SEA team with EDM, MIREM, MITADER and other relevant authorities.
- In collaboration with EDM, preparing TOR by reviewing SEA cases in Mozambique and in other countries and reflecting comments by MITADER
- Selecting SEA consultant based on, not only the experience of conducting EIAs for projects in energy sector of Mozambique, but also the experience of conducting SEAs. In the process of procurement, communicate with EDM, MIREM and MITADER for their advices.
- Collecting and organizing basic information/data necessary to carry out a SEA
- Confirming the relevance and consistency of the project with other relevant policies, plans, legislations (both national and international).
- Stakeholder analysis
- Comparing and examining alternative scenarios.
- Scoping
- Conducting impact evaluation, examining impact mitigation measures and monitoring plan.
- Organizing stakeholder meetings/public participations
- In SEA report, indicating how the results of SEA are reflected to the formulation of the master plan.

12. Other relevant information

None

END