

## 12. スコーピング・サマリー

### (2) The Environmental Management Act, 2004 (EMA 2004)

The overall objectives of the EMA 2004 are the following:

- To provide for legal and institutional framework for sustainable management of environment;
- To outline principles for management, impact and risk assessments, prevention and control pollution, waste management, environmental quality standards, public participation, compliance and enforcement;
- To provide basis for implementation of international instruments on environment;
- To provide for implementation of the National Environmental Policy;
- To repeal the National Environmental Management Act of 1983 and provide for continued existence of the NEMC: and
- To provide for other related matters.

### (3) The Environmental Impact Assessment and Audit Regulations, 2005

The Environmental Impact Assessment and Audit Regulations (hereinafter referred to as “the Regulations”) is made under the sections 82 and 230 of the EMA 2004, and published in Government Notice No. 349 on 4<sup>th</sup> November, 2005. The Regulations set out in detail the process to be followed in conducting an EIA, the form and content of EIAs, the review process, decision making processes and appeals.

The Regulations have 4 schedules as follows:

First Schedule	Types of Projects Requiring and Not Requiring EIA
Second Schedule	Project Screening Criteria
Third Schedule	Forms for EIA
Fourth Schedule	Steps for Conducting EIA

## 5.2 EIA Procedure

The Regulations prohibits implementation of a project which is likely to have a negative environmental impact, or for which an EIA is required under the EMA 2004, the Regulations or any other written law unless an EIA has been concluded and approved in accordance with the Regulations. A developer who intends to obtain an EIA certificate for his/her project has to initiate the EIA procedure. The EIA procedure involves the following steps: registration, screening, impact assessment, reviewing, permit decision, monitoring, auditing and decommissioning. **Figure 2** shows the EIA procedure schematically.

As the first step of the EIA procedure, a developer or proponent has to prepare a project brief of which format is set out in the Third Schedule of the Regulations and submit to the NEMC. The NEMC undertakes the screening of the proposed project guided by the screening criteria as specified in the Second Schedule of the Regulations and determines the appropriate level of environmental assessment. The decision of the NEMC on the project brief, together with a screening report (SR), is communicated to the developer or proponent within 45 days of submission of the project brief. One of the following decisions will be reached: full EIA required, preliminary assessment required, EIA not required and project proposal rejected.

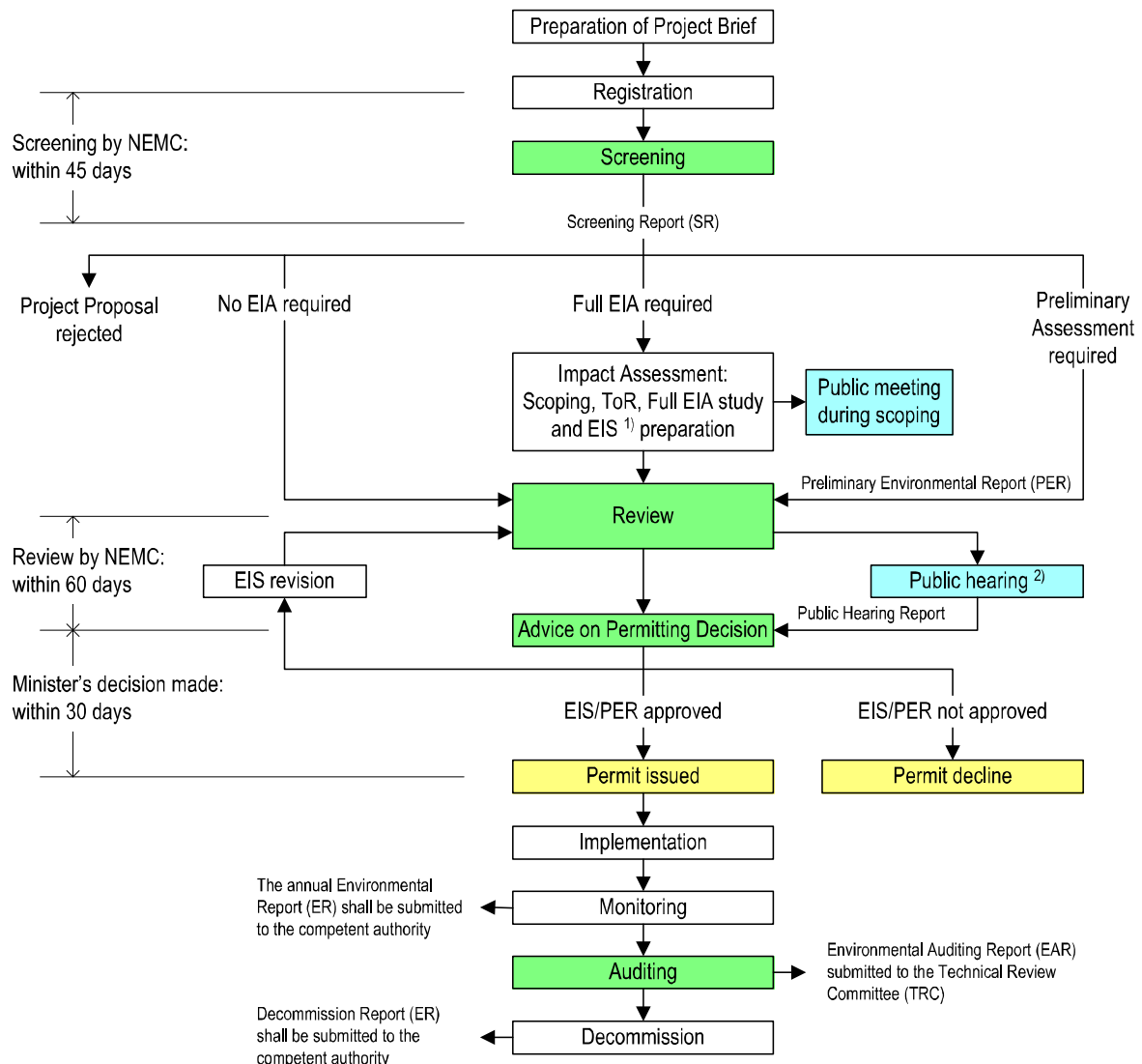
The preliminary assessment is an investigation to obtain just enough information to determine whether or not there will be significant adverse environmental impacts based on existing information. A field survey may be required to collect extra information. The results of the preliminary assessment are wrapped up as a Preliminary Environmental Report (PER).

In case when the NEMC finds that the project does not bring any significant adverse impact on the environment and the project report discloses sufficient mitigation measure, an EIA will not be required.

If the NEMC finds the potential that the project brings significant adverse environmental impacts and the project report disclose no sufficient mitigation measures, the developer or proponent will be required to carry out an EIA. The EIA involves the following three major steps: scoping, preparation

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of a Terms of Reference (TOR) and preparation of an Environmental Impact Statement (EIS).



Note:

<sup>1)</sup> Environmental Impact Statement (EIS) : A report or document prepared by the proponent after the conduction of EIA study to present the case for the assessment of their proposal as part of the environmental impact assessment process.

<sup>2)</sup> The public hearing is done only when there is any serious/ controversial environmental/ social issues.



**Figure 2 EIA Procedure in Tanzania Mainland**

An EIA will be conducted in accordance with scoping and the TOR developed during the scoping exercise by the developer or proponent. The developer or proponent will prepare a written report on the results of the scoping exercise. The scoping report should indicate at least:

- How the scoping exercise was conducted;
- Identification of issues and problem;
- Synthesis of results of the scoping exercise including details of potential negative and positive impacts;
- Stakeholder groups identified and how they were involved in the scoping exercise;
- Spatial, temporal and institutional boundaries of the project;

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- Project alternatives; and
- Terms of Reference.

The developer or proponent should develop methods of notifying the proposed project in a nationwide coverage and hold public meeting with the affected parties and communities to explain the project and its effects. Any concern raised by the public should be recorded and addressed in a draft EIS.

The draft EIS, PER and SR will be submitted for review. If the NEMC finds that the project has no significant negative impact on the environment and the project report discloses sufficient mitigation measure, the project will be recommended to the Minister for approval.

On the other hand, whenever there is strong public concern about the proposed project, the NEMC will organize a public hearing relating to the assessment. The hearing results will be taken into account in the environmental aspects and thus permit a decision to be made.

According to the EMA 2004 and the Regulations, actions taken by the developer or proponent in the EIA procedure should be conducted by experts or firms of experts whose names and qualifications are registered as such by the NEMC.

### 5.3 Other Key Legislations relating to Environmental Management

The other key legislations relating to environment management in terms of the location (inland) and the type (distribution of electricity) of the Project are tabulated as follows.

**Table 1 Other Key Legislations relating to Environmental Management**

Act	Implementing Authority
Land Act, No. 4 of 1999	Ministry of Land and Human Settlement
Village Land Act, No. 5 of 1999	Ministry of Land and Human Settlement
Land Acquisition Act, No. 47 of 1967	Ministry of Land and Human Settlement
Land Regulations of 2001	Ministry of Land and Human Settlement
Wildlife Conservation Act, No. 12 of 1974	Ministry of Tourism and Natural Resources
Forest Act, No. 14 of 2002	Ministry of Tourism and Natural Resources
National Parks Ordinance	Ministry of Tourism and Natural Resources
Public Health, Sewerage and Drainage Ordinance	Ministry of Health and Social Welfare
Water Utilization and Control Act, No. 42 of 1974	Ministry of Water and Livestock Development
Electricity Act of 2008	Ministry of Energy and Minerals

## 6. Outline of the Project

### 6.1 Background

Power supply is the important infrastructure in Tanzania to support its economic growth (above 5 % p.a. since 2001) and its power demand is expanding with growth rate of 8.6 % p.a. due to the activated economy. However, the power supply system has been in poor condition with overloaded operation and aging equipment because any necessary maintenance and upgrading of existing equipment along with the economic growth have not been done due to trial of privatization in power industry from 1992 to 2006 and, accordingly, stagnation of official support including assistance of international donors. On the other hand, electrification in national level is still 12 % which is far below the target of 20 % electrification by 2010 in the “National Strategy for Growth and Reduction of Poverty, 2005”. Because of this situation, the Government of Tanzania intends to develop power resources and improve power grids in accordance with the “Power System Master Plan 2009 Update (target year: 2033)”.

Similarly, the capacity of power supply in Kilimanjaro Region does not catch up with the increasing power demand accompanied by the rapid economic growth, while the region is the major international tourist destination of the country. In order to deal with this increasing power demand, the Government of Tanzania intends to enhance power generating facilities and improve transmission and distribution network in accordance with the Power System Master Plan.

In accordance with above background, the Government of Tanzania requested Grant Aid on construction of new substations, upgrading of existing substations and construction of 66kV

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transmission line in Kilimanjaro region.

### 6.2 Contents of the Project

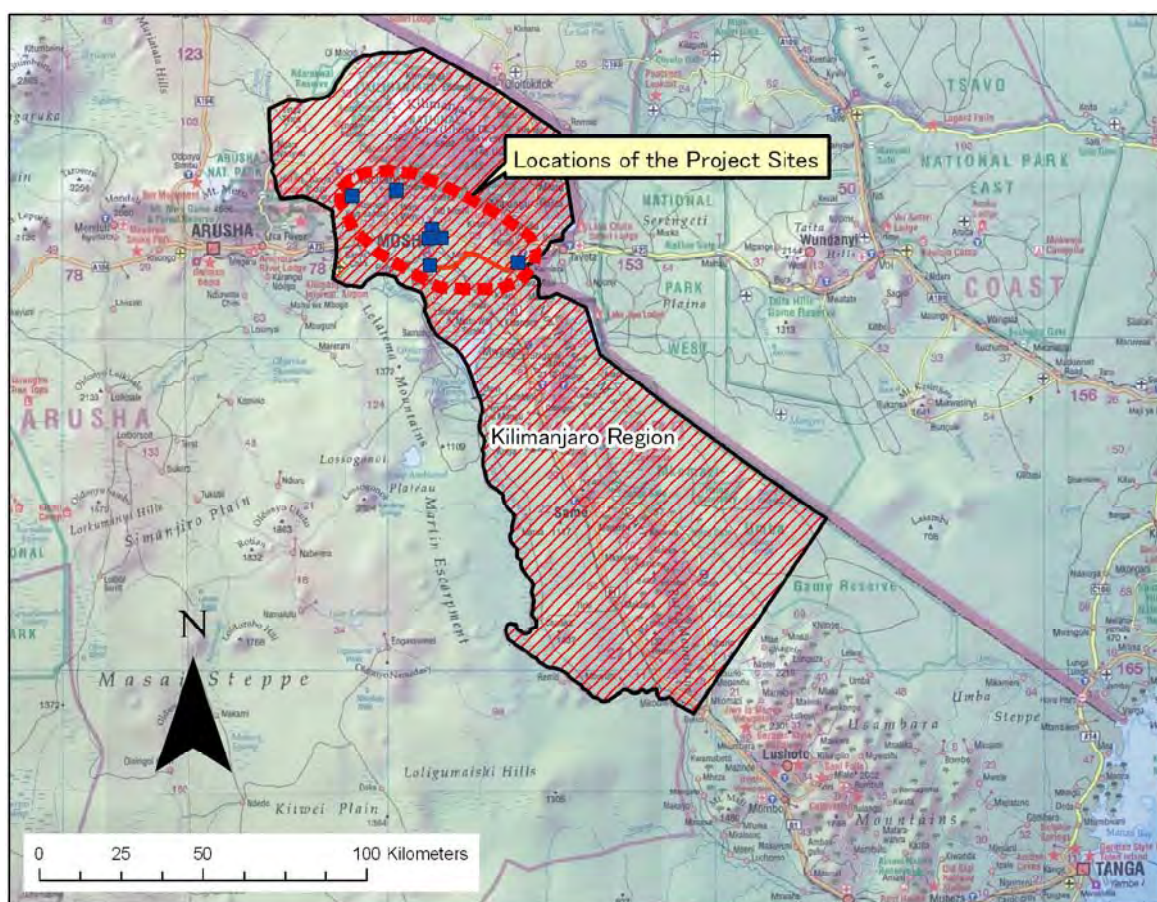
The requested project consisted of construction of new substations, upgrading of existing substations and construction of 66kV transmission line as stated above. At this stage, the contents of the project are elaborated taking into account the request and the results of the Preparatory Survey on the Project as shown in **Table 2**.

**Table 2 Activities included in the Project**

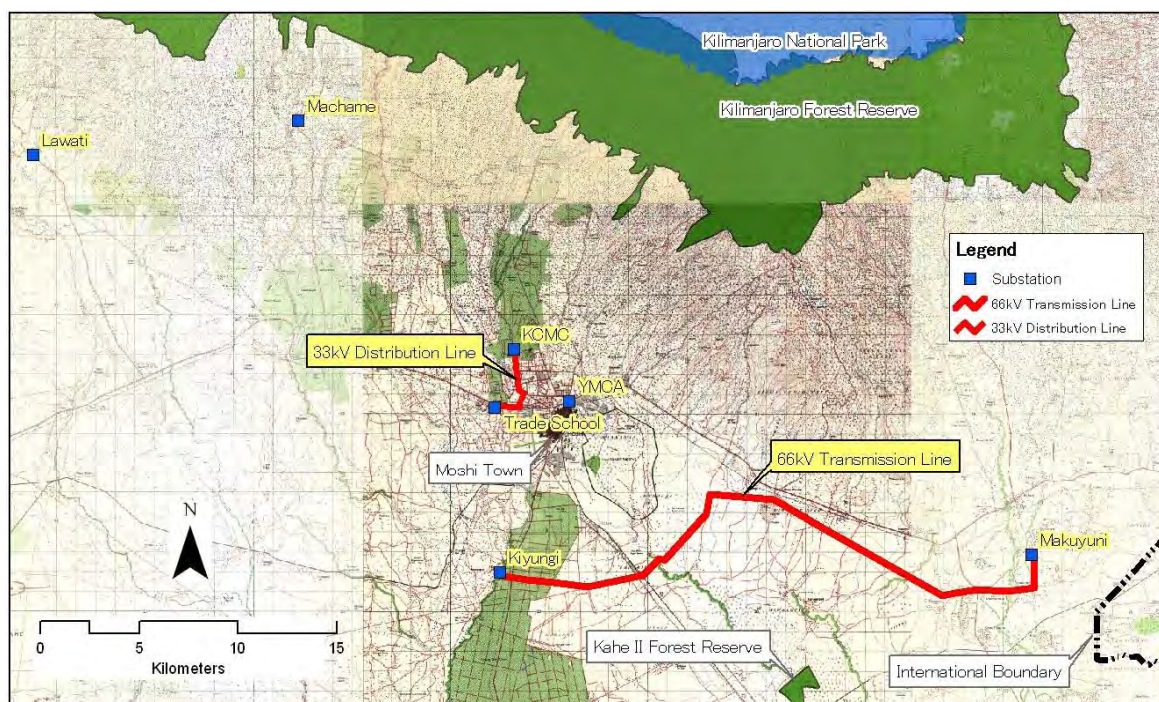
Contents	Locations	Activities included
Upgrading of Existing Substations	YMCA	Installation of: <ul style="list-style-type: none"> <li>• 33kV Incoming switchgear panel with VCB (1 No.)</li> <li>• 33/11kV, 15MVA Transformer with On-load Tap-changer (1 No.)</li> <li>• 11kV Switchgear panel (6 Nos.)</li> <li>• 33kV Cable and end treatment material (1 Lot)</li> <li>• 11kV Cable and end treatment material (1 Lot)</li> </ul>
	Lawati	Installation of: <ul style="list-style-type: none"> <li>• 33kV Incoming switchgear panel with VCB (1 No.)</li> <li>• 33/11kV, 10MVA Transformer with On-load Tap-changer (1 No.)</li> <li>• 11kV Switchgear panel (6 Nos.)</li> <li>• 33kV Cable and end treatment material (1 Lot)</li> <li>• 11kV Cable and end treatment material (1 Lot)</li> </ul>
	Machame	Installation of: <ul style="list-style-type: none"> <li>• 33kV Incoming switchgear panel with VCB (1 No.)</li> <li>• 33/11kV, 10MVA Transformer with On-load Tap-changer (1 No.)</li> <li>• 11kV Switchgear panel (6 Nos.)</li> <li>• 33kV Cable and end treatment material (1 Lot)</li> <li>• 11kV Cable and end treatment material (1 Lot)</li> </ul>
	Trade School	Installation of (33kV Outgoing bay): <ul style="list-style-type: none"> <li>• 33kV Outgoing switchgear panel with VCB (1 No.)</li> <li>• 33kV Cable and end treatment material (1 Lot)</li> </ul>
	Kiyungi	Installation of (66kV Outgoing bay): <ul style="list-style-type: none"> <li>• 33kV Incoming switchgear panel with GCB (1 No.)</li> <li>• 66kV Control panel (1 No.)</li> </ul> Installation of (132/66kV, 20MVA Transformer): <ul style="list-style-type: none"> <li>• 132/66kV, 20MVA transformer with On-load tap changer (1 No.)</li> <li>• 132kV switchgear (1 Lot)</li> <li>• 66kV switchgear (1 Lot)</li> <li>• 132kV Control and protection panel (1 No.)</li> <li>• 66kV Control and protection panel (1 No.)</li> </ul>
Construction of New Substations	KCMC	Installation of: <ul style="list-style-type: none"> <li>• 33kV Incoming switchgear panel with VCB (3 No.)</li> <li>• 33/11kV, 10MVA Transformer with On-load Tap-changer (1 No.)</li> <li>• 11kV Switchgear panel (6 Nos.)</li> <li>• 33kV Cable and end treatment material (1 Lot)</li> <li>• 11kV Cable and end treatment material (1 Lot)</li> </ul>
	Makuyuni	Installation of: <ul style="list-style-type: none"> <li>• 66kV Incoming line bay with GCB, etc. (1 No.)</li> <li>• 66kV Transformer bay (2 Lots)</li> <li>• 66/33kV, 10MVA Transformer with On-load Tap-changer (2 Nos.)</li> <li>• 33kV Switchgear panel (7 Nos.)</li> <li>• 66kV Control and protection panel (3 Nos.)</li> <li>• 33kV Control and protection panel (6 Nos.)</li> <li>• DC Supply equipment (1 Set)</li> <li>• 66kV Conductor (1 Lot)</li> <li>• 33kV Cable and end treatment material (1 Lot)</li> </ul>
Const. of New Transmission and Distribution Lines	From Kiyungi to Makuyuni	Installation of new 66kV transmission line
	From Trade School to KCMC	Installation of new 33kV distribution line

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The project sites are shown in **Figure 3** and **Figure 4**.



**Figure 3 Locations of the Project Sites (1/2)**



**Figure 4 Locations of the Project Sites (2/2)**

### 6.3 Implementing Agency of the Project

The implementing agency for the Project is the Tanzania Electricity Supply Company (TANESCO) which is state owned monopoly and the main supplier of electricity in Tanzania. Under the jurisdiction of the Ministry of Energy and Minerals, TANESCO operates in generation, transmission, distribution, and sale of electricity to the Tanzania Mainland and bulk power supply to the island of Zanzibar.

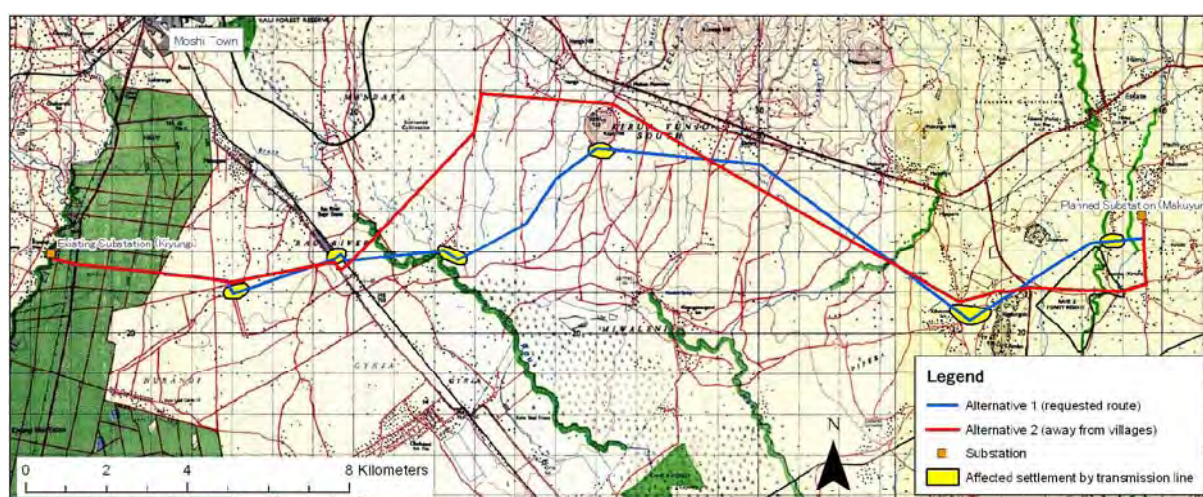
TANESCO is responsible for EIA procedure of the Project.

### 7. Development Alternatives

The following three alternatives are analyzed for optimizing of environmental and social impacts in both positive and negative aspects by the Project.

- Alternative 0. Non-implementation of the Project
- Alternative 1. Original route of 66kV transmission line that was requested from TANESCO to the Government of Japan in August 2009
- Alternative 2. Reviewed route of 66kV transmission line by a joint survey of TANESCO's Kilimanjaro Office and the JICA study team for the Preparatory Survey, in order to minimize adverse impact by the Project

**Figure 5** shows the routes of Alternatives 1 and 2. The requested route (Alternative 1) was outlined on a topographical map without detailed field survey. Consequently, the route did not keep away from settlements as shown in the figure. On the other hand, Alternative 2 was elaborated and rerouted through detailed field survey taking into account existing settlements that was kept away from the transmission line as much as possible.



**Figure 5 Alternatives for 66kV Transmission Line**

The characteristic features of those three alternatives are summarized in **Table 3**. Because involuntary resettlement is not expected, Alternative 2 is considered to be the most feasible route.

**Table 3 Characteristic Features of the Alternatives**

	Alternative 0	Alternative 1	Alternative 2
Description	Non-implementation of the Project	Passing through several settlements	Passing through one settlement
Total Extension	0	32.6 km	32.7 km
Benefit	None	Achieving stable electricity supply and bringing benefits such as improved public services, employment creation, etc.	Same as on the left
Impacts on Social Environment	None	<ul style="list-style-type: none"> <li>● A certain degree of adverse impacts such as loss of agricultural products</li> <li>● Improvement of regional community in terms of employment, public services, etc.</li> </ul>	Same as on the left
Impacts on Natural Environment	None	Slight possibilities of adverse impacts on natural environment such as soil erosion	Same as on the left
Possibility of Pollution	None	Slight possibility of pollution such as air pollution by construction machinery	Same as on the left
With or Without Involuntary Resettlement	None	A great possibilities of involuntary resettlement	None

## 8. Adverse Environmental and Social Impacts

Although the Project requires land acquisition and land clearance, it will not cause any involuntary resettlement as stated in the previous section. In addition, the Project does not cause any serious adverse impacts on the environment and society as a whole. The adverse impacts caused by the Project can be avoided or minimized by the normal mitigation measures.

As for the land acquisition, compensations for land, trees and farm crops are valued at market price by authorized valuer in an equitable manner. In fact, the procedure of land acquisition for the substation at Makuyuni has been smoothly implemented with consensus of the land owner and, at present, the land is at the stage of transfer of title.

In order for scrutiny of environmental category stipulated in the “JICA Guidelines for Environmental and Social Considerations, April 2010”, the possible adverse impacts have been identified by a joint meeting of the persons in charge of environmental matters in TANESCO and the JICA’s team for the First Preparatory Survey. The results of the joint meeting are shown in **Table 4**.

## 9. Mitigation and Monitoring for Key Impacts

The mitigation measures for the key impacts are shown in **Table 5**.

## 10. Future Steps of Environmental and Social Consideration for the Project

The procedure of environmental impact assessment in Tanzania Mainland begins with submission of an application to the NEMC in form of a project brief. The NEMC carries out screening with the project brief and determines whether or not an EIA is required as stated in the previous section.

TANESCO is currently preparing a project brief of the Project and will submit it to the NEMC for a screening. Whether an EIA is required or not will be determined after the screening. In general, a developer or proponent shall have experts or firms of experts in order for EIA procedure. However, TANESCO itself can undertake EIA procedure without hiring external environmental experts, because they have their own staff that is registered in the NEMC as environmental experts.

It is required to implement the appropriate measures for environmental and social considerations when implementing ODA. Alternatives must be examined to avoid or minimize adverse impacts and monitoring plan must be prepared according to the detailed project plan at the next stage. Besides, public meeting should be conducted to build consensus for the Project.

Table 4 Possible Adverse Impacts

Name of Cooperation Project			The Project for Rehabilitation of Substation and Transmission Line in Kilimanjaro Region								Description
	No.	Likely Impacts	Overall Rating	Const. Phase			Operation Phase				
				Land reclamation	Operation of const. machinery	Transportation of equipment	Existence of substation	Existence of transmission line	Existence of Distribution line	Emission of oil, wastewater, etc.	
Social Environment *the impacts on "Gender" and "Children's Right" might be related to all criteria of Social Environment	1	Involuntary resettlement									Involuntary resettlement is not expected because no house exists within the sites of substations, transmission lines and distribution lines.
	2	Local economy such as employment and livelihood, etc.	B	B	B	B	B	B	B		There is a possibility of agricultural production loss during construction phase and loss of agriculture lands by land acquisition. However, the adverse impact is limited because the total area of the affected lands is small.
	3	Land use and utilization of local resources	B	B			B				As for the newly developed substations, there are land use conversions from vacant or agricultural lands to substations.
	4	Social institutions such as social infrastructure and local decision-making									No adverse impact is expected.
	5	Existing social infrastructures and services									No adverse impact is expected.
	6	The poor, indigenous and ethnic people									No adverse impact is expected.
	7	Misdistribution of benefit and damage									No adverse impact is expected.
	8	Cultural heritage									No cultural heritage exists in/around the project sites.
	9	Local conflict on interests									No adverse impact is expected.
	10	Water usage or water rights and rights of common									No adverse impact is expected.
	11	Sanitation									No adverse impact is expected.
	12	Hazards (Risk) of infectious diseases such as HIV/AIDS	C	C	C	C					A certain risk of infectious diseases is expected during the construction phase. However, the extent of adverse impact is limited because hiring of local workers is expected and workers' lodging is not necessary.
Natural Environment	13	Topography and geographical features									Alteration of topography and geographical features is not necessary.
	14	Soil erosion	C	C	C						During the construction phase, there are possible soil erosions at the newly planned construction sites for Makuyuni and KCMC substations.
	15	Groundwater									The project does not include any activity affecting groundwater resources.
	16	Hydrological situation									The project does not include any activity affecting hydrology.
	17	Coastal zone									The project sites are not located in coastal zone.
	18	Flora, fauna and biodiversity									The project sites are not located in national parks or forest reserves.
	19	Meteorology									No micro-meteorological change is expected since the construction structures are small scale and do not include large-scale deforestation.
	20	Landscape									The planned transmission line does not cause additional damage on the landscape of the Mt. Kilimanjaro, because the line is located south side of trunk road (A23) which pass through south skirts of the mountain and there are not any touristic destinations in the south side of the transmission line.
	21	Global warming	B			B				B	SF6 gas under pressure is used as an insulator in circuit breakers at the substation of Makuyuni. However, the possibility of leak is considered to be small.
Pollution	22	Air pollution	B	B	B	B					There is emission of exhaust fumes from construction machinery during construction phase. However, the discharge amount is limited because the magnitude of construction works is relatively small.
	23	Water pollution	B							B	In case of accident, there is possibility of water pollution caused by leakage of insulation oil from transformers.
	24	Soil contamination	B							B	In case of accident, there is possibility of soil contamination caused by leakage of insulation oil from transformers.
	25	Waste	C	C	C	C					The project might replace old transformers in YMCA. However, it is not confirmed yet whether the old transformers contain PCBs or not.
	26	Noise and vibration	B	B	B	B					There is possibility of noise and vibration by operation of construction machinery during construction phase.
	27	Ground subsidence									No adverse impact is expected.
	28	Offensive odor									The project does not generate offensive odor.
	29	Bottom sediment	B							B	In case of accident, there is possibility of sediment contamination caused by leakage of insulation oil from transformers.
	30	Accidents	B		B	B	B	B	B		There is possibility of falls from height and electric shock.

Rating:

A: Serious impact is expected.

B: Some impact is expected.

C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progress)

No mark: No impact is expected. IEE/EIA is not necessary.

Table 5 Assumed Mitigation Measures

Items	Rating	Description	Assumed Mitigation Measures
Local economy such as employment and livelihood, etc.	B	There is a possibility of agricultural production loss during construction phase and loss of agriculture lands by land acquisition. However, the adverse impact is limited because the total area of the affected lands is small.	Scrutiny of the land use conditions and implementation of appropriate/ sufficient compensation
Land use and utilization of local resources	B	As for the newly developed substations, there are land use conversions from vacant or agricultural lands to substations.	Scrutiny of the land use conditions and implementation of appropriate/ sufficient compensation
Hazards (Risk) of infectious diseases such as HIV/AIDS	C	A certain risk of infectious diseases is expected during the construction phase. However, the extent of adverse impact is limited because hiring of local workers is expected and workers' lodging is not necessary.	Providing of proper guidance for construction workers to prevent infectious diseases when it is necessary
Soil erosion	C	During the construction phase, there are possible soil erosions at the newly planned construction sites for Makuyuni and KCMC substations.	Implementation of geological survey as well as soil test for new site and adoption of an appropriate construction method in the planning phase
Global warming	B	SF6 gas under pressure is used as an insulator in circuit breakers at the substation in Makuyuni. However, the possibility of leak is considered to be small.	Installation of a gas leak detection system
Air pollution	B	There is emission of exhaust fumes from construction machinery during construction phase. However, the discharge amount is limited because the magnitude of construction works is relatively small.	Proper maintenance of construction machinery to ensure complete combustion to reduce air emission
Water pollution	B	In case of accident, there is possibility of water pollution caused by leakage of insulation oil from transformers.	Taking of appropriate measures to prevent the spread of leaking oil and proper treatment of used oil, such as training of all employees on handling of oil and fuel
Soil contamination	B	In case of accident, there is possibility of soil contamination caused by leakage of insulation oil from transformers.	Taking of appropriate measures to prevent the spread of leaking oil and proper treatment of used oil, such as training of all employees on handling of oil and fuel
Waste	C	The project might replace old transformers in YMCA. However, it is not confirmed yet whether the old transformers contain PCBs or not.	Scrutiny of the old transformers and taking proper treatment, if necessary
Noise and vibration	B	There is possibility of noise and vibration by operation of construction machinery during construction phase.	No construction work at night in residential areas
Bottom sediment	B	In case of accident, there is possibility of sediment contamination caused by leakage of insulation oil from transformers.	Taking of appropriate measures to prevent the spread of leaking oil and proper treatment of used oil, such as training of all employees on handling of oil and fuel
Accidents	B	There is possibility of falls from height and electric shock.	Taking of appropriate measures such as installation of warning signs, obligatory use of safety gears at construction site

**資料－ 1 3    Environmental Checklist for Power  
Transmission and Distribution Lines**

# Environmental Checklist for Power Transmission and Distribution Lines ( 1 )

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	1) Have EIA reports been officially completed?	The EIA report (Environmental Impact Statement: EIS) has not been officially completed. The draft EIS has been submitted to NEMC. Currently, it is in the process of NEMC's review.
		2) Have EIA reports been approved by authorities of the host country's government?	The EIA report (EIS) has not been approved yet.
		3) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?	The EIA report (EIS) has not been approved yet.
		4) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	No other environmental permits were required.
	(2) Explanation to the Public	1) Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public?	Yes, contents of the project and the potential impacts have been explained to the public through scoping activities and EIA study. After the study the disclosure process will follow appropriately based on Tanzanian legal system and JICA's guidelines. The public's understanding will be obtained through the series of public meetings in the initial stage, detailed EIA stage and the disclosure process.
		2) Are proper responses made to comments from the public and regulatory authorities?	Yes, proper responses have been made to comments from the public and regulatory authorities through the process of scoping and EIA study.
2 Mitigation Measures	(1) Water Quality	1) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? If water quality degradation is anticipated, are adequate measures considered?	Although earthmoving activities will be expected at the sites of new substations of Makuyuni and KCMC and access roads to the 66kV transmission line, there is hardly any possibilities of degradation in downstream basin. Because magnitudes of those earthmovings are very small and countermeasures will be taken against soil erosion in the construction stages.
3 Natural Environment	(1) Protected Areas	1) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	Not applicable
	(2) Ecosystem	1) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	Not applicable
		2) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	Not applicable
		3) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	Not applicable
		4) Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife, and livestock?	Not applicable

## Environmental Checklist for Power Transmission and Distribution Lines ( 2 )

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
		5) Is there a possibility that improved access by the project will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered?	Not applicable
		6) In cases where the project site is located in undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?	Not applicable
	(3) Topography and Geology	1) Is there a soft ground on the route of power transmission lines that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed?	Not applicable
		2) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides?	Not applicable
		3) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	Yes, some areas are prone to soil erosion. Adequate measures will be put in place to prevent soil runoff
4 Social Environment	(1) Resettlement	1) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?	Not applicable
		2) Is adequate explanation on relocation and compensation given to affected persons prior to resettlement?	Not applicable
		3) Is the resettlement plan, including proper compensation, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?	Not applicable
		4) Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?	Not applicable
		5) Are agreements with the affected persons obtained prior to resettlement?	Not applicable
		6) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	Not applicable
		7) Is a plan developed to monitor the impacts of resettlement?	Not applicable
	(2) Living and Livelihood	1) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?	There is a possibility of agricultural production loss due to land acquisition. However, adequate measures are taken into account such as compensation by replacement cost basis and so on.

# Environmental Checklist for Power Transmission and Distribution Lines ( 3 )

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
		2) Is there a possibility that diseases, including communicable diseases, such as HIV will be introduced due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?	There is a possibility of such disease induction. Mitigation measures such as awareness raising for using of protective gears like condoms and concentrated use of local workers are taken into consideration.
		3) Is there a possibility that installation of structures, such as power line towers will cause a radio interference? If significant radio interference is anticipated, are adequate measures considered?	There is hardly any radio interference because the transmission lines are mostly installed in farm lands or vacant lands, and power line towers are installed far from living places.
	(3) Heritage	1) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?	Not applicable
	(4) Landscape	1) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	Not applicable
	(5) Ethnic Minorities and Indigenous Peoples	1) Where ethnic minorities and indigenous peoples are living in the rights-of-way, are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	Not applicable
		2) Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples?	Not applicable
	(6) Working Conditions	1) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?	No, the project will not violate any laws and ordinances associated with working conditions.
		2) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?	Yes, tangible safety considerations are in place based on TANESCO's safety policy and regulations.
		3) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public sanitation) for workers etc.?	Yes, intangible measures are planned and implemented for individuals involved in the project, based on TANESCO's safety policy and regulations.
		4) Are appropriate measures being taken to ensure that security guards involved in the project do not violate safety of other individuals involved, or local residents?	Yes, there are appropriate measures being taken to ensure that security guards involved in the project do not violate safety of other individuals involved, or local residents.
5 Others	(1) Impacts during Construction	1) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?	Yes, adequate measures are considered to reduce impacts during construction.
		2) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?	There is a possibility of adverse impacts on natural environment such as soil erosion, however, adequate measures are considered to reduce those impacts.
		3) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	There is a possibility of adverse impacts on social environment such as HIV infections, however, adequate measures are considered to reduce those impacts.

**Environmental Checklist for Power Transmission and Distribution Lines ( 4 )**

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
	(2) Monitoring	1) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?	TANESCO has developed monitoring program for necessary items. Currently, the monitoring program is under reviewing process by NEMC.
		2) Are the items, methods and frequencies included in the monitoring program judged to be appropriate?	The items, methods and frequencies included in the monitoring program are judged to be appropriate.
		3) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?	TANESCO has established the adequate monitoring framework.
		4) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	NEMC will give order for submission of the monitoring reports to TANESCO, if necessary.
6 Note	(1) Note on Using Environmental Checklist	1) If necessary, the impacts to transboundary or global issues should be confirmed, (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	Not applicable

- 1) Regarding the term “Country’s Standards” mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from the World Bank Safeguard Policy as a general rule, or the International Finance Corporation Performance Standards for private sector limited or non-recourse project finance cases, or other standards established by other international financial institutions, or other internationally recognized standards or good practices established by developed countries such as Japan regarding environmental and social considerations, the background and rationale for this deviation, and the measures to rectify it if necessary, are to be confirmed. In cases where local environmental regulations are yet to be established in some areas, considerations should be based on comparisons with international standards such as the World Bank Safeguard Policy, and appropriate standards of other
- 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

資料－１４ モニタリング計画  
(環境影響説明書からの抜粋)

### 11.9 Summary of Environmental and Social Monitoring Plan

**Table 27** provides a brief summary of the most important environmental and social monitoring activities that will be undertaken during construction and operation phases of the Project.

**Table 27: Summary of Environmental and Social Monitoring Plan**

Monitoring Activity	Monitoring indicators	Frequency /Duration	Responsibility	Monitoring Cost
<b>CONSTRUCTION PHASE MONITORING</b>				
Monitoring of sanitary facilities at construction site	<ul style="list-style-type: none"> <li>- Presence of toilets</li> <li>- Waste collection and disposal plan and sites</li> </ul>	<ul style="list-style-type: none"> <li>- Once at establishment of construction site</li> <li>- one day every two months</li> </ul>	TANESCO in cooperation with District Health Officer (DHO)	2,000 USD, costs to be covered by TANESCO
Monitoring of workshop and storage facilities where hydrocarbons are handled or used	<ul style="list-style-type: none"> <li>- Absence of oil spills</li> <li>- oil collecting points earmarked</li> <li>- clear instruction on how to handle hydrocarbons</li> </ul>	<ul style="list-style-type: none"> <li>- Once at establishment of workshop or work site</li> <li>- once every two months</li> </ul>	TANESCO in cooperation with District Environmental Officer	1,000 USD, costs to be covered by TANESCO
Monitoring of noise emissions	<ul style="list-style-type: none"> <li>- measurement of noise levels to compare with standard levels of 45dB(A) during the night and 70dB(A) during the day</li> </ul>	<ul style="list-style-type: none"> <li>- As needed but every three months</li> </ul>	TANESCO in cooperation with District Environmental Officer	2,500 USD, costs to be covered by TANESCO
Monitoring of waste handling and disposal	<ul style="list-style-type: none"> <li>- Time table for collecting wastes for disposal</li> <li>- Number of waste collecting bins</li> <li>- Disposal sites and disposal plan</li> <li>- premise cleanness</li> <li>- water quality standards</li> </ul>	<ul style="list-style-type: none"> <li>- Every three months</li> </ul>	TANESCO in cooperation with District health official and ward authorities	3,000 USD, costs to be covered by TANESCO

Monitoring Activity	Monitoring indicators	Frequency /Duration	Responsibility	Monitoring Cost
Employment to communities surrounding the project area	<ul style="list-style-type: none"> <li>- Check number people including youths employed by the project.</li> <li>- Paid salaries</li> <li>- Check no child labour</li> </ul>	Once a month	TANESCO, Labour office and contractor	3,000 USD, costs to be covered by TANESCO
Safety: <ul style="list-style-type: none"> <li>- Setting warning signs of dangers and traffic</li> <li>- Provision of safety gears</li> <li>- Awareness of the potential dangers</li> <li>- Avail safety procedures to workers</li> </ul>	Check: <ul style="list-style-type: none"> <li>- the Level of awareness</li> <li>- Type of safety gear provided</li> <li>- Presence of warning signs</li> <li>- Working procedures in place</li> </ul>	Audit inspection in the working sites every 2 months	TANESCO contractor and appointed consultant and OSHA	5,000 USD costs to be covered by TANESCO
Loss of security <ul style="list-style-type: none"> <li>- Control the number of job seekers</li> <li>- Improve security measures</li> </ul>	<ul style="list-style-type: none"> <li>- Monitor increase in the number of lawlessness and breaking incidences (thefts, killing, fights, etc.) from local offices and police stations</li> </ul>	every month during the construction period	Local authorities, TANESCO, Contractors, Police	10,000 USD costs to be covered by Contractor
Monitoring of potential impacts on health and HIV cases;	<ul style="list-style-type: none"> <li>- number of illness cases</li> <li>- number of awareness campaigns made</li> <li>- number of ARV given</li> <li>- number of condoms distributed</li> <li>- number of awareness material given</li> <li>- understanding and material given)</li> </ul>	Three months after the start of the project, six months later and after completion of the project .	TANESCO, NGO District doctor in cooperation with ward authorities	10,000 USD costs to be covered by TANESCO
Monitoring of construction sites to ensure that only the right of way is used to prevent unnecessary disruption of agricultural activities and conflict with property owners	<ul style="list-style-type: none"> <li>- Trespasses to private land other than the way leave corridor.</li> </ul>	Monthly on cropping season	Contractor in collaboration with the ward and village leaders	500 USD cost to be covered by contractor
Monitoring of the compensation process and dealing with grievances	<ul style="list-style-type: none"> <li>- Every PAP is paid</li> <li>- Grievances attended and solution sought</li> </ul>	Throughout the compensation process	TANESCO in collaboration with the District and local leaders	10,000 cost to be covered by TANESCO
<b>LONG TERM / OPERATIONAL MONITORING</b>	-			
Monitoring of potential impacts on health and	<ul style="list-style-type: none"> <li>- number of illness cases among TANESCO employees and</li> </ul>	Once a year	TANESCO in cooperation with Health official	10,000 USD costs to be covered by

Monitoring Activity	Monitoring indicators	Frequency /Duration	Responsibility	Monitoring Cost
HIV cases; other illnesses;	community - number of awareness campaigns made - number of VRV given - number of condoms distributed - number of awareness material given - number of days missed from work due to illnesses - % of workforce who are ill			TANESCO
Safety in the work place: - Presence of warning signs of dangers - Awareness of the potential dangers - Availing of safety procedures to workers	Check: - the Level of awareness - whether safety gears are provided - Presence of warning signs - Working procedures in place	Once every year	TANESCO and OSHA	5,000 USD costs to be covered by TANESCO
Fire prevention and emergency preparedness	Check - Working fire fighting equipment - Presence of required fire extinguishers - Training of personnel to combat fire incidence	Once every year	TANESCO and Fire department	10,000 USD to be covered by TANESCO
Monitor potential impact on birds	- Number of birds killed through collision and electrocution	- Annually after completion of the line	TANESCO in cooperation with District Natural Resource Officer	2,000 USD, costs to be covered by TANESCO
Monitoring of way leave cultivation and maintenance activities	- For unsafe activities under the line and in the way leave - Unauthorized way leave interference	- Every six months and during cropping season	TANESCO in cooperation with District agriculture officer and local leaders	2,000 USD, costs to be covered by TANESCO
<b>DECOMMISSIONING PHASE</b>				
Monitor the decommissioning process once the project comes to an end	- decommissioning plan in place and implemented as planned	- End of the project	TANESCO	Decommissioning budget

Monitoring Activity	Monitoring indicators	Frequency /Duration	Responsibility	Monitoring Cost
Equipment are removed	- equipment and materials removed from site	- End of the project	TANESCO	Decommissioning budget
Smooth workers retrenchment and or retraining	- training program in place - mind and psychological preparation conducted - terminal benefit available and paid	- Six months before closing date and at closing date	TANESCO and Labour Office and Workers Union	Retrenchment package
Rehabilitation of the land to the original state	- rehabilitated site	- End of the project	TANESCO and Municipal Environmental Officer and NEMC	Decommissioning budget

## 資料－１５ 環境社会配慮モニタリングフォーム

## 15. 環境社会配慮モニタリングフォーム

### MONITORING FORM

Note: TANESCO should submit regular reports to JICA in accordance with the following monitoring items.

#### 1. Construction Phase

(1) Workshop and storage facilities where hydrocarbons are handled or used

Monitoring Item	Remarks (Measurement Point, Frequency, etc.)
<ul style="list-style-type: none"><li>• Absence of oil spills</li><li>• Oil collecting points</li><li>• Instruction on how to handle hydrocarbons</li></ul>	<ul style="list-style-type: none"><li>• Once at establishment of construction site</li><li>• Once every two months</li></ul>

(2) Noise

Monitoring Item	Remarks (Measurement Point, Frequency, etc.)
<ul style="list-style-type: none"><li>• Measurement of noise levels to compare with the following country's standards<ul style="list-style-type: none"><li>- 45dB during night</li><li>- 70dB during day</li></ul></li></ul>	<ul style="list-style-type: none"><li>• As needed but every three months at the nearest residence</li></ul>

#### 2. Operation Phase

Not applicable