Annex-4

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure [a lot] /[lots] of land necessary for the implementation of the Project and to clear the [site]/[sites];		●
2	To construct the following facilities		
	1) The building	●	
	2) The gates and fences in and around the site	●	
	3) The parking lot	●	
	4) The road within the site	●	
	5) The road outside the site (including Access road)		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the [site]/[sites]		
	1)Electricity		
	a. The distributing power line to the site	●	
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		●
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site	n/a	n/a
	b. The gas supply system within the site	n/a	n/a
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services [be exempted] / [be borne by the Authority without using the Grant]		●
6	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To ensure that [the Facilities and the products]/[the Facilities]/ [the products] be maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
10	To give due environmental and social consideration in the implementation of the Project.		●

Annex -5

Project Cost Estimation (Confidential)

This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant Aid.

This page is closed due to the confidentiality

Appendix 5 Environment Impact Assessment Registration Form

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL

ENVIRONMENTAL IMPACT ASSESSMENT REGISTRATION FORM
(To be completed in duplicate)

Fee: 20,000/= Serial no.:

FORM EA 1

PROPONENT: TANZANIA ELECTRICT SUPPLLY COMPANY LIMITED

PROJECT: Rehabilitation of Substations and Transmission Line Construction Project in Kilimanjaro Region

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ASSESSMENT No.: File No.: ____

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NATIONAL ENVIRONMENT MANAGEMENT COUNCIL - NEMC

ENVIRONMENT IMPACT ASSESSMENT REGISTRATION FORM

1.0 PROPOSED UNDERTAKING/DEVELOPMENT

The proposed undertaking is named as "**Rehabilitation of Substations and Transmission Line Construction Project in Kilimanjaro Region"**

Introduction

Tanzania Electric Supply Company Limited (TANESCO) is a parastatal organization under the Ministry of Energy and Minerals (MEM) established in 1964. TANESCO is incorporated under the Companies Act (Cap 212).

The company's core business is Generation, Transmission and Marketing. TANESCO's generation system consist of mainly hydro (561MW) and gas thermal based generation (>=145MW). It also purchases power from independent power producers SONGAS (189MW) and IPTL (100MW) making the total installed capacity in the Main Grid System to be 1051MW.

The transmission lines comprise of 2840 km of 220kV; 1617 km of 132kV; and 534 km of 66kV by the end of September 2009. The distribution system network supply voltage are 33kV and 11kV which serve as the backbone stepped down by distribution transformers to 400/230V for residential, commercial and industrial supply. The total network by November 2009 was 11,967km of 33kV; 5,063 km of 11kV and 25,381km of low voltage lines.

This project brief aims to provide enough information to environmental authority (NEMC) so as to screen the proposed project as per the Environmental Impact Assessment and Audit Regulations of 2005 requirements.

Current Situation of Transmission and Distribution System in Kilimanjaro Region

Transmission, substation and distribution system in Kilimanjaro has been used for 20 to 30 years and faces severe deterioration. Transformers at primary and secondary substation are almost overloaded and long distances of 33kV and 11kV distribution lines cause voltage drop. Rombo feeder for example which is the longest 33kV feeder from Boma Mbuzi substation is extended up to 100km and once the feeder trips the whole feeder is forced to shut down without any switching device along the line.

The above mentioned situation causes low reliability and poor quality of power supply. This situation calls for urgent action to address the problems as soon as possible in order to vitalize economic activities, secure the quality of public services and improve social welfare in Kilimanjaro region.

Therefore, the main activities involved in this project will be the construction of new substations and transmission lines together with the rehabilitation of the existing substations in the Kilimanjaro Region. The works to be involved are as follows:

- Construction of the 66kV transmission line about 34Km from Kiyungi substation to Makuyuni-Himo.
- Construction of new 66/33kV Substations at Makuyuni
- Upgrading of 33/11kV Substations (Lawate, Machane, YMCA and Kiyungi) by increasing the capacity of transformers (e.g. at Kiyungi there will be the Installation of 20MVA/132/66kV transformer)
- Installation of 132kV incoming/outgoing bays at Same substation
- Construction of outgoing 33kV feeders at Makuyuni-56Km including the proposed Makuyuni-Mkuu Rombo feeder
- Construction of switching yard at Mkuu Rombo
- Construction of 33 kV line from Trade school to Gomberi
- Construction of new 33/11kV substations at KKCMC and Gomberi.

(**Refer to Fig. 1**)

Construction of 66kV transmission line

This will involve the 34km of construction between Kiyungi Substation and the new proposed Makuyuni substation. The transmission line will need at least a 10m way-leave corridor. Construction materials will be basically gravel, sand, cement and steel towers and aluminium alloy wire conductors. The design layout is as seen in **Figure 2**.

Apart from solid wastes such as pieces of conductors, wood, pieces of metals and household wastes to be generated during the construction period no wastes will be generated in the course of operation of the line.

There will be a number of people between 50 and 100 employed and casual labourers who will be doing various works during construction phase. It is envisaged that most of these jobs will be taken by Tanzanians except for some few highly skilled technical staff from Japan and other subcontracted companies.

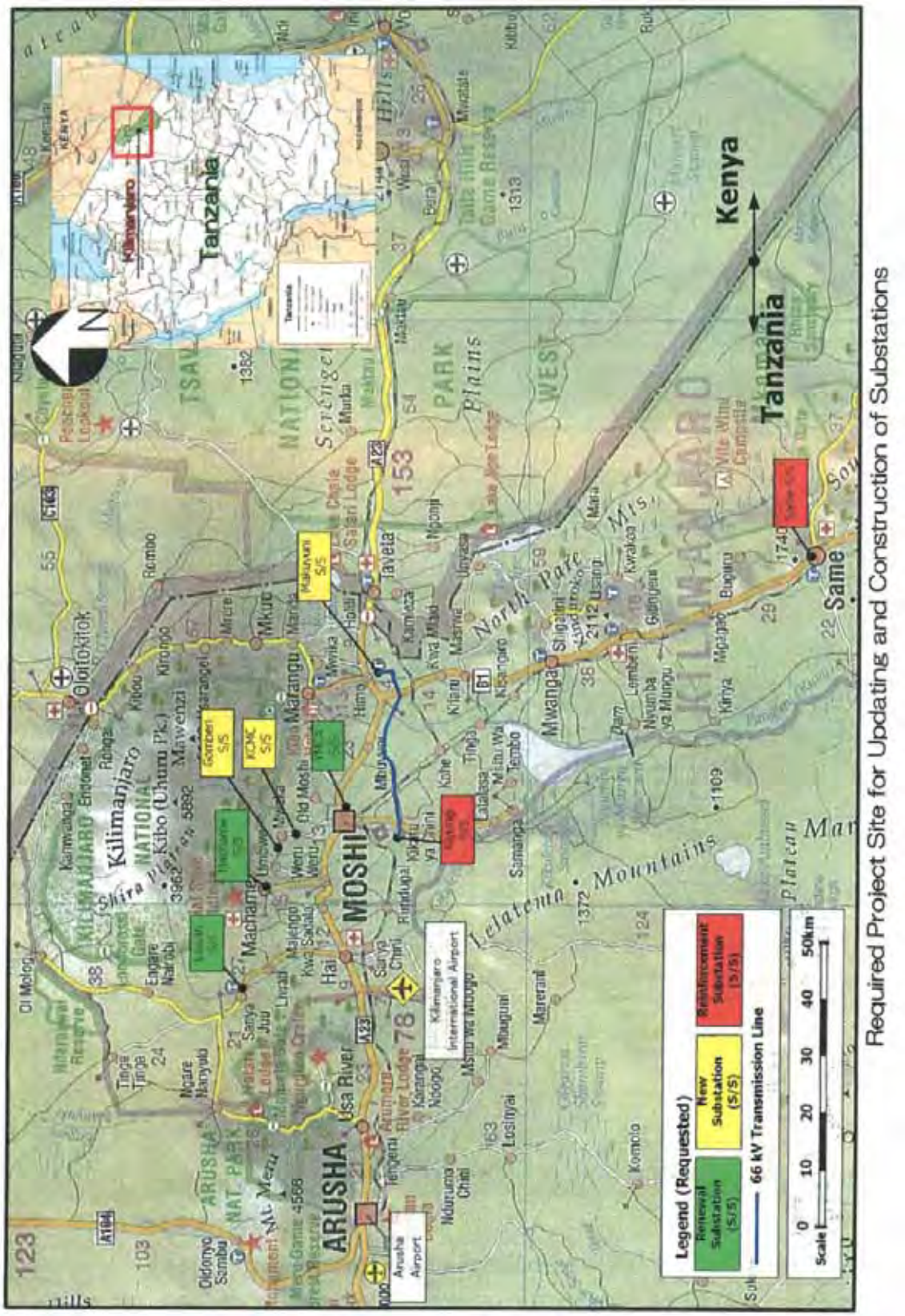


Figure 1: Project Site

During construction, a number of light and heavy duty vehicles will be used to carry out various duties including ferrying construction workers, construction materials, lifting loads and pulling conductors during stringing of the conductors. In addition, a bulldozer D6 or D8 will be used to clear a way leave before erection starts.

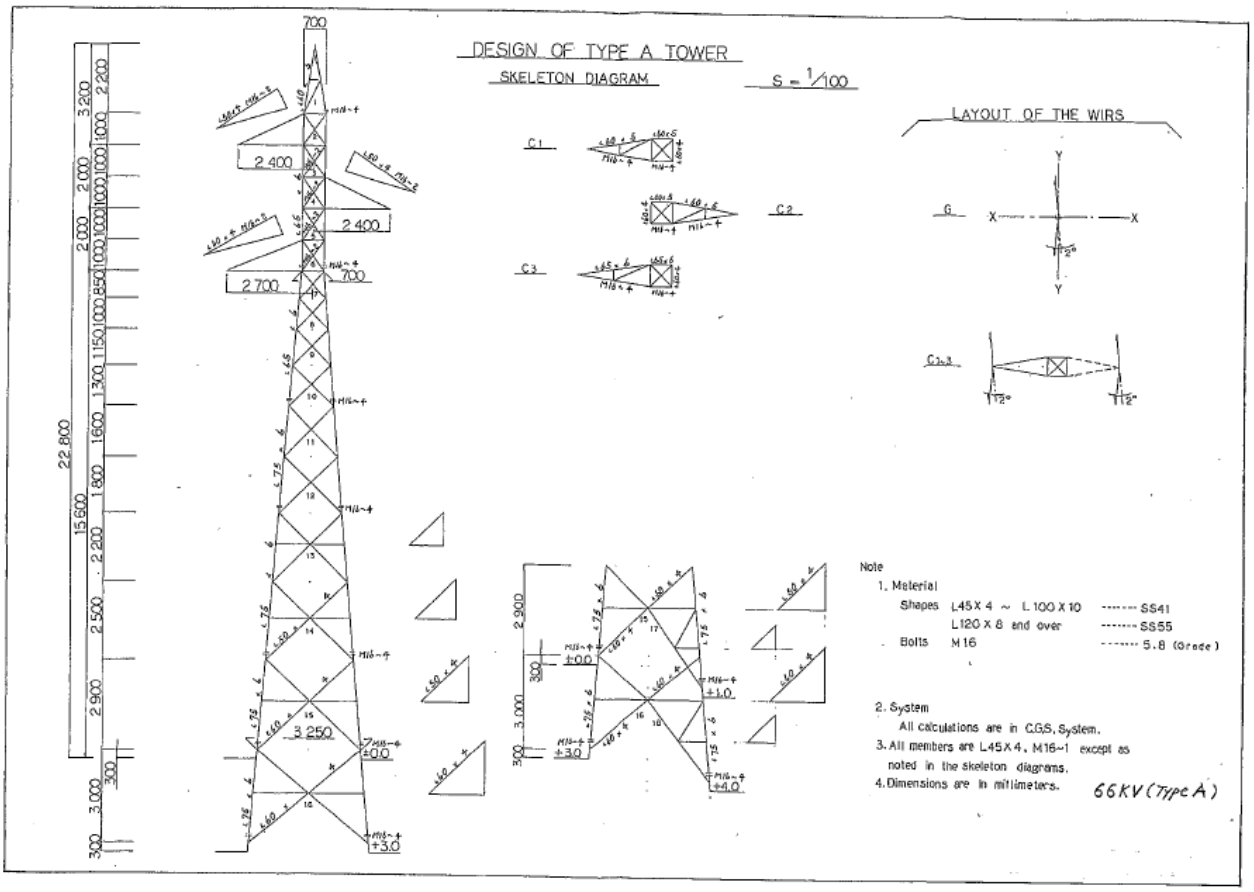


Figure 2: Proposed tentative Tower Design

Rehabilitation and upgrading of substations

The rehabilitation and upgrades of substations will involve changing the old transformers with new transformers with higher capacity as follows:

S/N	Name of Substation	Capacity of the New Transformer	Remarks
1	YMCA	15MVA/33/11kV	Upgrade
2	LAWATE	10MVA/33/11kV	Upgrade
3	MACHAME	10MVA/33/11kV	Upgrade
4	KIYUNGI	20MVA/132/66kV	Upgrade

The upgrade will use the same existing substation site (refer **Figure 3**). Hence there will be no land take for upgrade of these substations. The work will involve simple excavations to erect the transformer foundations and installation of transformers with their accessories.

During construction solid wastes such as pieces of conductors, wood, pieces of metals and household wastes will be generated due to construction activities. Used transformers will be available for use in other areas. Old gravels will be re-used in the same substation. The new transformers will have the oil filled during manufacturing. No considerable wastes will be generated in the course of operation of the substation.

Rehabilitation of the substations will employ 10 t0 15 people during rehabilitation peak time. This will include non-skill to highly skilled jobs working in various rehabilitation works. Depending on the job requirement, Tanzanians will be given priority to take those jobs.

Figure 3: Typical Example of Substation Arrangement and Rehabilitation Work

Construction of new Substations

S/N	Name of Substation	Capacity of the New Transformer	Remarks
1	KCMC	10MVA	New Substation
2	GOMBERI	10MVA	New Substation
3	MAKUYUNI	20MVA/66/33kV	New Substation

The construction of new substations will basically involve the installation of new transformers, protection system and a switch yard (refer **Figure 4**). It is expected that the substation will be outdoor type. The KCMC and Gomberi substations will be located in the land owned by KCMC and Gomberi farms respectively hence no land acquisition will be required for these substations.

Figure 4: Example of a 33/11kV Substation to be constructed

Land for locating the Makuyuni substation will have to be acquired from land owner. Processes for land acquisition are in advanced stage and the land owner is in the process of being compensated.

The proposed sites will undergo site clearance, levelling and compaction. Then foundation works for transformer seating, in-coming and outgoing feeder gantry

structures, switching installations etc. The substations will be enclosed for the safety reasons.

Construction materials will be gravel, sand, cement and iron bars, insulators, transformers, and conductors.

During construction it is anticipated that wastes such as pieces of conductors, wood, pieces of metals, broken insulators and household wastes will be generated. However during operation of the substation no wastes are expected.

There will be a number of people between 15 and 20 employed ranging from casual labourers to high skilled people who will be doing various works during construction phase. It is envisaged that most of these jobs will be taken by Tanzanians except for some few highly skilled technical staff who will come beyond the borders. During operation phase the substations will be remotely controlled and technicians will visit the substation for maintenance purposes. For Makuyuni substation at least 3 people will man the operation of the substation with an alternative of remote controlled option.

During construction, a number of light and heavy duty vehicles will be used to carry out various duties including ferrying construction workers, construction materials and lifting loads.

2.0 PROPOSED SITE

The proposed project is located in Kilimanjaro region. For the 66kV line, the 34km transmission will commence at existing Kiyungi substation close to Tanganyika Plantation Company (TPC). With a way leave corridor of at least 10m, the line will cross a sugarcane plantation following the existing access roads. Then the line passes through the agricultural fields and unpopulated areas of Mabogini, Rau River up to Makuyuni (Himo in Moshi Rural District). At Makuyuni a 66/33kV substation is to be constructed to feed all areas of Himo, Marangu together with Rombo districts. (**Refer to the attached 1:50,000 Overview Map**).

The land that will form part of the way leave is currently used for agriculture. At TPC the land is used for sugarcane plantation. At Mabogini the land is irrigated and they grow paddy, vegetables and beans. From Rau River to Mandaka mixed farming banana, paddy, beans and maize. From Kiruwa Vunjo to Kilatotoni again mixed farming of maize, beans, sunflowers, groundnuts and legumes (*Choroko*).

From Kilatotoni to Lotima there is a mixed farming, semi arid land and irrigated areas as one approaches Lotima village. The line has crossed in unpopulated areas. The **Photo Documentation (Attachment 1)** attached herewith depicts some of the features in pictorial views.

There will be improvement of distribution system at Mkuu Rombo through the construction of switching station which will receive a 33kV from Makuyuni Substation. The upgrade of lines will use the same existing lines only with change of conductors and insulators.

The new substations of KCMC and Gomberi will use the land owned by the institutions to feed power around Shanty town, KCMC, and Mweka areas. The land required for each 33/11kV substation is 30m by 40m and for the makuyuni 66/33kV substation the required land is at least 40m by 40m. The current land uses of these substation sites are open space for the KCMC and farmland for Gomberi and Makuyuni.

3.0 INFRASTRUCTURE AND UTILITIES

The proposed infrastructures are mainly transmission line and substations. Therefore, there will be steel towers, conductors, transformers, switchgears, insulators, protection devices and enclosures of the substation sites. While some items will be outdoor, others may be indoors particularly protection devices. As described earlier, the land size for substations and transmission line is 1200m^2, 1600m^2 and way-leave corridor of 10m for 34km respectively.

The installations will not use water apart from normal water uses during construction phase and domestic water uses at substations designed to be manned by people such as Makuyuni 66/33kV. During the operation no water will be used by the line or automated substation. Septic tanks and soak pit will be the only sewerage method to be used for sewage collection.

The substations will use own power from the grid system for internal lighting and security lighting. However for protection devices, external DC batteries will be used.

The construction of the 66kV transmission line will require an access road throughout the way-leave corridor during construction and maintenance purposes. However, new access road will be constructed only if the is no existing access

roads. All substations new and old have are accessible thus there will be no access road requirement.

4.0 ENVIRONMENTAL IMPACTS

Following the route survey and preliminary field trip conducted in May, there are various findings concerning Environmental (bio – physical) and Social impacts that were identified:

- The areas to be covered by the proposed line and Substations are mostly communal lands used mainly for agriculture. These lands will be acquired from the communities hence there will be a need for compensation in order to acquire the way-leave. Houses will be avoided as technically possible.

- The area proposed for construction is already disturbed by human activities, where it is currently used for cultivation purposes, as fallow land, pastures (grazing areas) and sugarcane plantations.

The proposed project will have the following impacts:

- Potential impacts related to land disturbance resulting from site clearing and construction of the line route for example soil erosion and mass wasting due to land degradation.

- Potential social impacts resulting from activities on the line route, presence of people on the site and health and safety impacts the construction of the line, access of way leave and other facilities. Examples may include:
    - Probability of new cases of HIV/AIDS, STDs infection caused by immigration of people to the project area,
    - social conflicts,
    - property theft
    - noises,
    - risk of fire and explosion.
    - Outbreak diseases like diarrhoea and cholera can also occur due to high concentration of people at the site.
    - Injuries to people can be a big safety concern caused by moving heavy machines and vehicles mainly during the construction phase.
    - unplanned pregnancies
    - disruption of norms and values of the given place due to interaction of new workers who will be working on the site are the likely impacts

- The most important negative social and economic impacts will be the removal of houses falling in the way leave. However, houses will be avoided as far as technically possible.

- Besides the negative impacts there will be potential positive impacts associated with this project ranging from individual benefits to national economy. Examples include:
    - Temporary employment to local individuals which will boost up the household income of the communities around the project area during the construction phase.
    - Self employments for small entrepreneurs in areas around the project for such work as supply of foods for construction workers and doing business with people working for the project.

- Taking the way-leave of 10m for 34km, the lost agricultural land is about 34 hectares. However, agricultural activities in the way-leave area are generally tolerated (but not formally allowed) as long as the height of plants does not exceed 3 m. The area lost for cultivation will be limited to floor-spaces needed for substations, tower foundations and access ways along the line. Hence the total loss of the land is reduced significantly after the construction activities and the way-leave corridor is used for cultivating short crops. In addition, the benefits the farmers will have from using access roads for their purposes may reduce or even over-compensate their losses of the land in the long term.

Further details on impacts are in **Attachment 2**

5.0 OTHER ENVIRONMENTAL ISSUES

The proposed project poses no significant risks or hazards to the environment. This type of project is common for TANESCO activities hence not new in our country. The only concern is a safety risk particularly electric shock and electrocution if there is no safety measures or there is negligence and if no precautions are not taken. TANESCO has in place safety policy which has been a backbone to safety especially when working with electricity. Therefore, safety measures will be in place to ensure safety of people, their properties and working personnel.

6.0 IMPACTS MITIGATION AND ENHANCEMENT MEASURES

TANESCO is committed to ensure that any significant impacts identified are mitigated within its capability. To ensure this TANESCO shall:

- Raise awareness of employees and local communities surrounding the project regarding protection of the environment, interaction with local environment, and health and safety issues (e.g. infectious diseases such as HIV/AIDS, STDs).

- In planning the detailed routing of access roads and other infrastructures to avoid built up areas and clearance of ecologically sensitive vegetation species that may exist.
- Ensure daily environmental and safety management best practices for minimizing and prevention of accidents and hazardous materials as well as soil erosion controls.
- Put in place measures to deal with emergencies (fire, accidents, etc)
- Make a provision for monitoring the implementation of mitigation measures during construction.

Further details on mitigation measures and implementation of environmental and social management plan are obtained in **Attachment 2**.

DECLARATION

I…….....hereby declared that the information provided on this form is true to the best of my knowledge and I shall provide any additional information that shall come to my notice in the course of the processing of this application.

…….. ……

Signature Date

PHOTO DOCUMENTATION

PLATE 1: Vegetation covers at the proposed 66kv transmission line in the yamuMkaa Village.

PLATE 2: This is an area where the proposed MkuuRombo Substation will be built

PLATE 3: A section of Mabogini people who attended a consultative meeting for the proposed 66kV line is listening to their fellow resident giving his views about the project.

PLATE 4: Meeting with Stakeholders at Mabogini

PLATE 5: Environmental Degradation (severe soil erosion) in Yamu Mkaa

PLATE 6: Grazing animals is one of activity in the project area here is at Yamu Mkuu

PLATE 7: This is Mabogini area where the line will cross the railway line and go straight ahead

Plate 8: This is the area where the proposed Makuyuni Substation will be built.

Plate 9: A section of Sugarcane plantation at Kiyungi where the proposed transmission line will follow at the edge of this access road

Plate 10: A proposed site for KCMC Substation

Plate 11: Vegetation Cover and physical features at Kilatotoni overlooking Makuyuni Direction

Plate 12: Vegetation Cover and physical features at Kilatotoni overlooking Kiyungi

CONCERNS FROM STAKEHOLDERS:

In a preliminary public consultation survey conducted for this project, the stakeholders had the following concerns and opinions:

1. The first speaker started by thanking the TANESCO for involving the affected people from the very beginning of the project. The speaker wanted TANESCO to know is that if 20m wide corridor will be taken from their land particularly paddy farms (*boda*) they will be very much affected by the project because they depend on those paddy farms for their livelihood. Hence he believes that the project will cause them great harm psychologically and particularly children since the land is becoming smaller and smaller in size.

2. Employment should be offered to the village residents first in all villages through which the proposed transmission line passes.

3. The compensation to be fair and promptly.

4. Use of land under the transmission line for the agriculture activities should be allowed. (i.e. restrictions on land use should be eased)

5. We want to know clearly the actual area where the proposed transmission line passes to be sure of people who will be affected by the project.

6. There must an open communication to all affected people to avoid the misunderstanding about the project.

7. They wanted to know what will be the benefit of the Project to the people surrounding the project area.

8. They would like to be involved in every process of the project.

9. Most of the people likely to be affected by the project wanted to be allocated a new plot in the very neighbourhood since the compensation money will not be sufficient to buy the same land.

10. People would like TANESCO to compensate them satisfactorily to the point that they will be able to live comfortably as they are currently living there.

11. TANESCO should try to look for a place to divert the line where people to be affected will be fewer.

12. People living close to the transmission lines want assurance of their safety from the electricity emissions if any.

13. People wanted to know compensation modality and how is it going to be implemented. Also wanted to know what is going to be compensated.

1. PROJECT ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES CONSIDERATIONS

1.0 Impact Identification and Analysis

The impacts presented in this chapter are the result of extending the 66kV power line from Kiyungi to Makuyuni and installation of new and rehabilitation substations. The impacts are predicted based on nature of the project, field observations and discussions with experts and concerns of people and local leaders. The assessment and valuation of impacts for different project components is characterized based on the following parameters:

- **Likelihood** –Terms to be used include unlikely, likely or certain (definite) which will refer to the level of possibility (probability) that the impact will occur. Unlikely will mean that the possibility (probability) of occurrence is limited or none because of the inherent nature of the project and design to be used; -Likely will refer to the possibility that the impact may occur and certain (definite) will mean that the impact will surely occur irrespective of the preventive measures adopted.

- **Extent of the impact:** spatial distribution – extent of an area/volume covered or to be affected and whether it is local, regional, transboundary or global. The spatial extent or zone of impact influence can be predicted for site-specific versus regional occurrences.

- **Nature of the impact:** for both positive and negative impacts; it may mean direct, indirect, cumulative or synergistic. The most obvious impacts are those that are directly related to the proposal, and can be connected (in space and time) to the action that caused them. A typical example of direct impacts is destruction of habitat caused by forest clearance.

  Indirect or secondary impacts are changes that are usually less obvious, occurring later in time or further away from the impact source. For example anxiety, stress and community disruption associated with increased traffic volumes and noise caused by road development.

  Cumulative effects, typically, result from the incremental impact of an action when combined with impacts from projects and actions that have been undertaken recently or will be carried out in the near or foreseeable future. These impacts may be individually minor but collectively significant because of their spatial concentration or frequency in time. Cumulative effects can accumulate either incrementally (or

additively) or interactively (synergistically), such that the overall effect is larger than the sum of the parts.

- **Type** – the environmental impact type could be of biophysical, social, health or economic

- **Magnitude:** This is typically expressed in terms of relative severity, such as major, moderate or low. Severity, as opposed to size, also takes account of other aspects of impact magnitude, notably whether or not an impact is reversible and the likely rate of recovery.

- **Timing:** This refers to the understanding that impacts arising from all the stages of the life cycle of the project are considered (i.e. during construction, operation and decommissioning). Some impacts will occur immediately, while others may be delayed, sometimes by many years.

- **Duration:** Some impacts may be short-term, such as the noise arising from the operation of equipment during construction. Others may be long-term, such as the inundation of land during the building of a reservoir. Certain impacts such as blasting may be intermittent, whereas others, such as electromagnetic fields caused by power lines, may be continuous. Impact magnitude and duration classifications can be cross-referenced.

- **Significance:** This depends on the characteristics of the predicted impact and its potential importance for decision-making. Significance is usually attributed in terms of an existing standard or criteria of permissible change, for example as specified in a standard, policy objective or plan.

- **Intensity** – This parameter assesses the magnitude of the impact or violation of a certain standards.

- **Reversibility:** whether the impact is reversible or irreversible

It is anticipated that the proposed project will have both positive (beneficial) and negative impacts on certain aspects of biophysical and social environment to the people and surrounding environment in the project areas. These impacts may occur during mobilization, construction, operation and maintenance and decommissioning phases. The impacts may be due to one or more of the following activities though the list is not exhaustive:

- Site and route clearance (preparation)

- Transportation and storage of equipment and construction materials
- Holes digging
- Poles erection
- Installation of porcelain insulator cups and stringing of conductors
- Erection of transformers
- Operation and maintenance of the power line
- Securing the health and safety of working site, materials, and people

1.1 Potential Environmental and Social Impacts

1.1.1 Positive impacts

1.1.1.1 Employment Opportunities

The project will generate few but definite direct job opportunities for both skilled and unskilled labour during construction and operation phases. It is expected that local contractors and residents within respective project areas will take most of these job opportunities though the job will be for a short time. On the other hand there will be indirect employment created after the availability of reliable electricity and opening up of more workshops, improved guest houses, establishment of small local industries and employment in the form of provision of goods and services. The impact is positive and moderately significant and may have long term effect in the social well being in the region.

1.1.1.2 Impact on economic growth

The project will have indirect benefits that include impulses to socio-economic development in project areas. These improvements will attract more people to invest more in tourism, industries and commerce which will contribute to economic growth of Kilimanjaro Region

1.1.1.3 Improved communication services

Availability of reliable electricity will enable the establishment of stable communication facilities such as Internet. Electricity will enable mobile communication to improve as people will be able to own phones and charge them at home and other mobile companies can build communication towers in the district. Easy communication will improve business and social life thus enhancing economic growth and improve quality of life.

1.1.1.4 Connection of more customers

Construction and completion of the project will enable availability enough electricity in the region and particular Rombo and Moshi Rural that can enable many people to be connected without any problem thus improve the livelihood in the region.

1.2.2 Potential Negative Impacts

1. 2.2.1 Land Degradation and Soil Erosion

Some parts of project area are prone to soil erosion (refer Plate ..). Clearing of vegetation cover on the way leave to allow the excavation works for tubular pole foundations and access roads may open up the soil to the agents of erosion. However, the route selection will minimize the need of access road and enable the existing roads to be used to transport construction materials and to be used during operation and maintenance phase. Therefore, it is expected that the impacts will be low, localised and will concentrate on already disturbed road zone. The impacts will occur mainly during the construction stage and they will be of short term. The impact is reversible as well.

1.2.2.1.1 Mitigation Measures

In case it is necessary to clear up vegetation during construction time and for smooth operation, ground clearance will be minimised as far as possible. Route selection will avoid areas with sensitive vegetation.

1.2.2.2 Pollution (Air, Soil and Water)

Construction activities normally produce gaseous wastes, dust (especially in dry seasons) and liquid pollutants that may pollute the air, soil and water. The use of vehicles and other similar equipment will emit fumes and will produce dust that may pollute the atmosphere in the project locality.

Oil spillage may contaminate soil and water sources if not properly handled. However, it is anticipated that the pollution as a result of vehicle operations and maintenance will be very low, temporary and localized.

1.2.2.2.1 Mitigation Measures

The impact on water source pollution can be severe; however the likeliness of occurrence is minimal. The impact on air and soil are expected to be low (minimum) and localised. The following measures will be considered during the implementation of the project (the work plan): -

- The contractor will provide guidelines on oil and fuel handling to prevent careless oil and fuel spillage to avoid water and soil pollution. Regular supervision will be put in place.
- Solid matters, debris, and other waste pollutants soaked with oil (contaminants) will be collected and disposed of in designated disposal areas to prevent them from going into surface and underground water or soil.
- Should there be large excavated materials and debris from construction activities, care will be undertaken not to stockpile or deposit them near the

stream banks or other watercourse perimeter where they can be washed away by high water or storm runoff.

- Equipments and vehicles will be properly maintained to ensure complete combustion to reduce air emission. Maintenance policy shall be strictly implemented and closely followed.
- Should there be some people working in the dust areas continuously or for longer periods, nose and mouth respirators will be provided to them.

1.2.2.3 Aesthetics and Visual Impact

It is expected that the construction of 66kV transmission line will add up to already existing structures in project areas. The presence of these pole and conductors will permanently change the landscape in the project areas. However, majority of these project areas, are not aesthetically or visually sensitive sites. Hence the impact will be local, negative and low in significance.

1.2.2.3.1 Mitigation Measure

- The best mitigation measure would be the use of underground cable. However, due to financial constrains, an underground cable option is not financially desirable. Hence overhead poles are the only option. Hence they will be aligned to the existing environment.

1.2.2.4 Noise

Construction activities may generate temporary noises depending on the type of equipment used and number of people employed. However for the current project, most activities will be done manually with few equipment, vehicles and employing a small number of people for foundation works, poles erection and pulling of the conductors. Hence, noise and vibrations resulting from the proposed project is insignificant, intermittent, temporary and localized.

During the operation and maintenance stage no noise and vibration impact is expected along the line. There will be only irregular visits by lighter vehicles during line inspection and maintenance.

1.2.2.4.1 Mitigation Measures

The allowable noise level in residential areas is 55dB(A) during the day. When employee stays somewhere with the noise levels exceeding the allowable level in prolonged time, TANESCO and contractor will ensure that the earplugs are provided to employees. For this project no work is expected to be done at night in residential areas. At night the noise limit level is 45dB(A).

1.2.2.5 Impact on Flora

During the implementation of a project, at least 10m wide clearance of vegetation will be made for 66kV line. This clearance will be made during survey work, construction, operation and maintenance period. These clearances may affect the existing flora in the right of way temporarily or permanently.

1.2.2.5.1 Mitigation Measures

Total vegetation clearance may cause other impacts such as soil erosion. Hence to reduce impact on flora TANESCO and contractor will:

- Minimize the vegetation clearance to what the safety of the line requires and confine the clearance on the line corridor and poles foundation areas.
- Shift the line whenever big indigenous trees as well as exotic or natural tree forest patches are encountered. Use will be made of open lands whenever practically possible.
- Prevent bush fires through awareness programs to workers during the project implementation. The project supervision team will in collaboration with local leaders (ward and villagers) carry out fire prevention measures and apply the existing by-laws and local knowledge of fire prevention to contain bush fires.
- Whenever possible the project will facilitate the villages during fire disasters at a time of project implementation phase to ensure that fire is contained in shortest time possible.

1.2.2.6 Fauna

It is expected that no significant wild fauna will be found in the project area due to existing human activities in the project area. In other parts of the world the main concern with power line is electrocution of animals and birds' hitting the power. For this project no significant impact is expected. However, the following mitigation measures are proposed.

1.2.2.6.1 Mitigation Measures

In spite of the insignificance of the impact, precaution will be taken to protect the animals likely to cross the line. Hence:

- Care will be taken to protect birds and small mammals from electrocution by installing all safety measures possible in areas likely to cause bird collision with the power line. All areas potential for birds' passage will be avoided whenever possible.
- Breeding areas for avifauna will be protected and avoided whenever possible.
- Measures shall be taken to protect wild fires by putting restrictions on live matches and by conducting awareness raising campaign to workers during the project implementation.
- All high voltage risk areas along the transmission line and transformers shall be guarded to prevent animals against shocks and electrocution.

1.2.2.7 Accidents

It is known that whenever there are activities involving people, machines, vehicles and other equipment, accidents are always inevitable if precautions are not taken. There will be accidents from vehicles during construction ranging from falling, cutting, hammering, hitting, knocking etc. Then during operation, the accidents may be electrocution and electric shock. These accidents may affect the construction workers as well as the members of general public. The impact severity ranges from high to low depending on the level of injuries and or death.

1.2.2.7.1 Mitigation Measures

Accidents can be minimized if machines are properly maintained, cutting edges are protected or guarded, and people including workers are aware of the dangers and understand how to protect themselves and others. On the other hand it is a role of supervisors to ensure that safety measures are in place and are enforced (implemented).

Accidents can be reduced if health and safety rules and procedures are in place and are followed voluntary or enforced. Hence, to reduce accidents TANESCO will:

- In collaboration with contractors and other stakeholders ensure that safety measures are in place and are observed during the construction and operation stages.
- In collaboration with contractors hold meetings with local communities and local leaders to raise awareness about the imminent dangers and how to prevent them.
- Erect the warning sign boards:
    - To warn the public on potential dangers at appropriate ongoing construction sites
    - To warn motorists and pedestrians on road safety
- Put danger sign on each transmission and distribution wooden poles to alert people of the live conductors above the poles.
- Raise awareness to construction workers on the ways of minimising accidents and risks of bush fire outbreaks.
- Instruct workers to care for their own safety and safety of other people, and ensure that protective safety gears are provided and are utilized.
- Set up well-stocked **First Aid** kits at working site and ensure that contractors comply with company safety policy.

1.2.2.8 Surface Water Quality

Surface water quality can be undermined if oil and fuels spill flow into water bodies. In addition, extensive vegetation clearance especially in sloppy areas particularly during the rain period can also undermine surface water quality and increase soil erosion and sedimentation. However, the extent of the impact will depend on extent of spillage and magnitude of other causative factors such as downpour, and level of awareness of

employees to prevent spills. However, the usage of oil and fuel is limited to transformers and vehicles. While transformer oil is containerized, the maintenance of vehicles will be done in workshops. Hence the probability of surface water pollution is small and the impact is low in significance and is localised as far as precaution measures are taken.

1.2.2.8.1 Mitigation Measures

To ensure that the project does not impact on surface water quality TANESCO will:

- Prevent unnecessary oil spills by workers or machinery on the site by putting up special maintenance areas where oil or oil soaked wastes will be collected and right disposed of.
- Raise the level of awareness of employees about the environmental and social impacts and train them how to protect the environment through careful handling of oil and fuel in their daily duties.
- Whenever possible minimize vegetation clearance and soil disturbance close to rivers
- Waste oils will be collected and sent to the designated areas where it can be incinerated in the furnace or can be reused.
- Transformers which contain several litres of transformer oil will be diked to contain the oil in case of spillage.

1.2.2.9 Soil pollution

Construction stage

It is expected that construction and operation activities may cause accidental oil or fuel spills particularly in storage areas and maintenance bays. This spill may impact soil quality in those areas surrounding storage or maintenance areas. However, this impact will be small.

- **Operation stage**

During operation of the line no soil pollution is expected under normal circumstance unless transformers leak. However the likelihood of impact is small.

1.2.2.9.1 Mitigation Measures

TANESCO will:

- Whenever possible design and use containment to store fuel, oil and other substances that may cause the soil pollution
- Designate special areas for maintaining equipment likely to contain oil. Waste oil, spillage, oil soaked clothes, oil filters, etc. will be collected and disposed in a right manner in a designated areas.
- Collect all oil soaked items or wastes and safely dispose them
- Raise awareness level of all employees handling oil and fuel containing equipment on best practices when handling oil or oil soaked substances to prevent unnecessary oil spills and to protect the environment in their daily duties

- Construct a container like around the transformer to take care for any transformer failure that may spill the oil.

1.2.2.10 Material and equipment use at construction sites

Improper selection, storage and handling of materials may become a source of environmental problems in the project area. Materials such as Polychlorinated Biphenyl's (PCBs) and asbestos will not be used in the project.

The use of non-degradable materials such as plastic bags has become nuisance in many parts of Tanzania. Thus plastic bags and containers need to be properly managed during the implementation for this project.

1.2.2.10.1 Mitigation Measures

TANESCO and contractors will:

- Select materials that are environmentally acceptable i.e. equipment that are free from PCBs and asbestos
- Collect all non-degradable materials such as plastic bags, plastic containers, pieces of metals, broken conductors, insulation materials, etc. from the construction sites and kept in a safe place or dispose of them safely and in environmental friendly manner.

1.2.2.11 Archaeological and Cultural Aspects

Generally, the development of linear projects like transmission and distribution lines have low impacts on communal cemeteries (burial sites) places of worship and archaeological importance. No archaeological places of value have been identified during a preliminary field survey of the project area. It is possible that during project implementation, old objects of archaeological values may be discovered. Although the chances of discovering the archaeological sites are small the following mitigation measures are to be implemented:

1.2.2.11.1 Mitigation Measures

- All burial sites, family or communal cemeteries will be identified in collaboration with local, religious and traditional leaders and marked to ensure that they are avoided as much as possible. In case it is found that the transmission line interferes with these places, measures will be taken to alter the direction of the route or adjust the placement of the tower.
- All fossils, coins, articles of value or antiquity and structures and other remains or items of archaeological interest found on the work sites will be placed under the care and authority of local leaders, project engineer and reported to relevant authority for guidance. The contractor shall upon discovery of any such findings, promptly give notice to the project engineer who shall issue instructions for dealing with it.

- In case it is not possible to avoid cemeteries and graves, excavation should be done after all parties have reached the consensus in terms of reburial costs and other requirements have been fulfilled and permission has been granted by concerned relatives, religious leaders or community and all government procedures are followed.

1.2.2.12 Relocation of people and their properties

It is planned that the implementation of proposed project should not physically relocate any person as far as it is practically possible through appropriate route selection. Avoiding relocation of people prevents many social impacts of the project.

1.2.2.12.1 Mitigation Measures

TANESCO shall prevent or reduce the impact of relocating people by:

- Carrying out thorough surveys of all routes to determine alternative routes that will avoid build up houses.
- Use of the existing access road whenever possible.
- When all alternatives have been exhausted and found out that the only alternative is to cross through someone's house, compensation will be made following the approved Resettlement Policy Framework and the existing Land Laws (Land Act of 1999).
- Where compensation is necessary then it will be done in a transparent manner and according to the legal and institutional framework of Tanzania and by involving the affected people from the beginning of the process to its end.
- People whose land will be permanently affected will receive financial compensation according to the existing land laws in Tanzania.
- In areas where agriculture activities are done, farmers will be given ample time notification prior to the starting of the construction works to allow farmers to plan for the harvest or adjust cultivating plan.

1.2.2.13 Impact on agriculture

Agriculture forms the backbone of livelihood in rural areas. The implementation of this project may affect some of the farming activities if done during cropping season particularly paddy farms. This is because paddy needs contained water and the construction activities (way-leave clearance) may damage those containerized edges. However the impact is low as only a small part of the line will affect paddy farms.

1.2.2.13.1 Mitigation Measures

- Compensation will be paid for the land taken and the crops found on the way leave according to the land acquisition laws.
- Prior information will be given before start the implementation of the project

1.2.2.14 Physical Presence of Immigrant Workers

The implementation of the project will attract skilled and unskilled labourers from different parts of the country who will be working on the project. The presence of these workers will interfere with the local communities' life styles, which may lead to the increase of conflicts of socio-cultural nature and spread of diseases especially sexually transmitted diseases.

The impact is likely to occur however, it is expected to be short term confined to the construction period. The impact is of high significance. In addition, since employment chances are very few, those who shall not get jobs might jeopardize the security of the project area.

1.2.2.14.1 Mitigation Measures

TANESCO will:

- Promote good relations through regular meetings with local leaders to discuss impending issues that may be source of conflict and through making employees aware of their obligation (dos and don'ts) when they are working and residing in the local community.
- Subject both workers and the local communities to awareness raising campaigns so as to promote good relations and avoid the unnecessary conflicts.
- Provide information about the level of job availability during the project implementation early on so as to discourage a high expectation of job seekers.
- Provide health care education to workers and local communities particularly on the spread and prevention of sexually transmitted diseases (STDs) and HIV/AIDS in the project area. Condoms will be available to workers and local residents.
- Discourage the contractor from hiring unskilled labourers from outside the affected villages. Priority of jobs will be given to the communities directly affected by the project.

1.2.2.15 HIV/ AIDS

HIV/AIDS has become one of the deadliest diseases in the country. Sexual relations, human behaviours, drunkenness and poverty are blamed for spreading the disease. People's interaction that leads to sexual relations are very common in project areas thus care must be taken even for this project. This issue need to be addressed in terms of health and as a potential social impact in terms of interaction with contractor's staff and the local communities.

1.2.2.15.1 Mitigation Measures

A special HIVAIDS programme will be prepared by the TANESCO or contractor and implemented by an employed NGO in associated with TANESCO environmental section. The programme will address HIVAIDS awareness and prevention and the

contractor is expected to cooperate in full with the programme including releasing workers periodically to take part in the programme.

1.2.2.16 Impacts of Electromagnetic Waves on Human Health

The strength of electromagnetic waves is proportional to the level of voltage (i.e. the higher the voltage the higher the strength of electromagnetic fields). Even though there is still no concrete scientific proof connecting the magnetic field with human effects, it is thought that electromagnetic waves generated along transmission lines may cause health problems to the people who are directly exposed to them for long period of time. Hence it is advised to reduce exposure periods in strong waves especially for people who are directly exposed. The exposure limits stipulated by International Commission on Non-Ionizing Radiation Protection (ICNIRP) and IEEE defines 5kV/m as the maximum allowed limit for human exposure for 24hrs. While the maximum limit for magnetic fields (MF) is 100FT[1]. Therefore, for 66kV transmission lines the electromagnetic fields are expected to be low and are not expected to cause any severe risk to human health in terms of radiation. However, precautionary attitude will be maintained and measures taken to avoid the possible effects of those waves to human health.

1.2.2.16.1 Mitigation Measures

TANESCO will:

- Abide by safety measures and enforce them to ensure that no one is establishing a permanent residence under the power line. Periodic monitoring will be implemented.
- In collaborate with local authorities, alert people about the risks that may result from establishing a permanent residence in the way-leave and under the power line.
- Demarcate the way-leave corridor for people to know the safe distance for the 66kV line.

1.3 Decommissioning

It is assumed that this project will continue to exist for as long time as villages and towns will continue to exist. It is expected that village load demand will grow over time. Therefore, what will be required is the maintenance of the lines and upgrade it accordingly to carry extra load.

1.3.1 Mitigation Measures

When he lines are no longer needed, the following will be done:

- Wires, insulators and steel materials will be removed from the site. Good ones will be re-used while the bad ones will be disposed accordingly in an environmental friendly manner.

[1] Source: The Canadian Handbook on Health Impact Assessment, Vol. 4 Health Impacts by Industry sector.htm, p.7

- Disturbed land especially for the primary substations will be rehabilitated as per the Land Act No. 4 of 1999 requirement (i.e. reclaim the land into a state that will be used by others after completion of the project).
- Transformers will be collected and returned to the workshop for re-use where there is a need. During transportation of the transformers care will be taken to prevent oil leaks to the environment.
- Denuded land areas will be re-vegetated.

2. PUBLIC AND STAKEHOLDERS CONCERNS AND OPINIONS

This chapter highlights in a nutshell observations, concerns and opinions obtained from sampled public representatives and stakeholders about the project during the field work. The main concerns and opinions that arose from stakeholders are outlined below:

- People wanted to know if they will be allowed to continue cultivating their land when the line passes through their fields (*shamba*) particularly paddy fields.
- People requested the project proponent to avoid passing through the centre of the irrigated farms (*boda*) instead find a way of passing along the access roads. A 10m to 20m way leave will be too much for them because people depend on these *boda* fields for their livelihood.
- People were concerned about the benefit to be accrued by accepting project to pass through their land.
- People were worried that compensation may be done during dry season where there is no crops and hence reduce the value of their productive land.
- Compensation for the lost properties particularly land needs to be fair to avoid complaints as people are very sensitive on the question of land value.
- People requested critical and meaningful participation in the process stating from sensitization of the project, on compensation issues, and transparency in actual payment.
- People wanted a written document that will inform them in detail about the project and the compensation processes so that everybody can read and understand.
- Land is very sensitive issue in Kilimanjaro and people own small piece of land. The argument is if the project takes 20m way-leave some people will be landless. Hence the way leave should be small as far as possible.
- People requested employment priority given to the local people

These issues will be addressed in the design of the line and when acquiring land for the project. This is because some issues are purely line design and route selection while others are procedural issues stipulated in the Land Laws.

3. IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PLAN

This section provides outlined details of what is required of the contractor/proponent with regard to Environmental and Social issues. The success of ESMP implementation depends upon commitment of the project proponent (TANESCO, Government of Tanzania) and contractor in the terms of resource allocation (finance and personnel), the presence of working enforceable environmental laws, and presence of workable standards and awareness of all key players. Below are some of the needful of this ESMP

3.1 Social Requirement

General requirement

It is a contractual obligation for the contractor to take due cognisance of the social requirements as stipulated in this ESMP.

Social requirements are those which ensure that the project acts as a good neighbour the principle governing good neighbourliness is that the welfare of local people and local communities should not be reduced and preferably should be increased by having the project in their vicinity.

The contractor will appoint a Social Management Officer (SMO) from his own staff who will be readily available to local representatives for discussions of all reasonable project-related issues and will seek to arrange for rightful grievances to be speedily and appropriately redressed and opportunities for beneficiation of local communities to be realised.

Specific social concerns are those to do with the occupational and use of land, the procurement of water and other local resources, the participation of local people and communities in the project economy by means of preferential employment and the chance to sell foodstuff to the workforce, the aversion of risk, the creation of a channel of communication whereby local communities may readily make their views heard and may receive information, the timely dissemination of accurate and adequate information about the project to local people, and the meaningful consultation with the local community with regard to project planning, design and implementation.

In order to minimise social disruptions on the neighbouring communities, the contractor shall preferentially hire labour from the nearby local communities and shall offer local workers preferential opportunities for employment and technical or vocational training, as far as possible without detrimental to the quality or duration of the works.

In hiring local labour the contractor shall comply with all Tanzania laws and regulations related to labour and the workforce, including those laws passed under the Employment and Labour Relations Act of 2004, as well as applicable International Labour Organisation.

The contractor shall not knowingly employ any worker under the age of eighteen years nor allow any subcontractor to hire any person under the age of eighteen years, save that a 17 year old apprentice receiving vocational training could be employed under appropriate conditions that make provision for training.

The contractor shall ensure that proper payment of all applicable taxes and levies associated with the hire of local staff is made to Tanzania Revenue Authority and social security funds. The contractor shall also recognise the rights of unions and employees rights of association.

3.2 HIV/AIDS Minimization

The contractor (and proponent) has an obligation to institute on-site HIV/AIDS awareness campaign and preventive measures. Project proponent or contractor himself will implement HIV/AIDS awareness and prevention programmes through a hired NGO and workers must be allowed to attend awareness campaigns.

Given the increasing seriousness of the HIV/AIDS problem and the perception that projects and personnel involved serve as one of the principal means of the virus moving from one part of the country to another, the project proponent/ contractor must integrate HIV/AIDS issues into all of their activities.

General Requirement

The contractor shall allow his employees to take part in regular HIV/AIDS awareness and prevention campaigns for the duration of the contract.

Orientation process of new employed workers must include HIV/AIDS awareness. The prevention of sexual abuse and exploitation of children will form part of that campaign.

Posters will be displayed in workplaces as part of the campaign.

Contractor/proponent must provide suitable sites or meeting rooms for communication activities and for condom distribution.

The awareness campaign activities will commence at the start of the construction period and continue throughout the construction period.

3.3 Environmental Requirements

Mitigation measures outlined above will be implemented to ensure that the project is implemented without causing severe environmental and social impacts. In addition to the environmental mitigation measures, contractor/project proponent shall take note of the material and equipment supplied that they meet specification as part of the contract.

3.4 Declaration of Hazardous Substances

The contractor shall submit a declaration of all the materials used in the manufacture of the plant and equipment being supplied for the project. The declaration shall list all the

constituent material, their percentage of the plant item by weight, whether they can be recycled at the end of the equipment life and comments on the method of recycling to be used. The contractor/supplier shall declare all substances classified as hazardous in the equipment being supplied. These materials may be either hazardous to health (e.g. carcinogens, toxic, radioactive, dermatitis-inducing) or to the environment (contribute to global warming, ozone depletion, water pollution)

The contractor shall submit safety data sheets for all hazardous substances used in the manufacture of an item of plant. This includes packaging waste that can have associated biological issue such as transmission of disease or introduction of unwanted flora and fauna.

Should it be found that the plant or its packaging contains hazardous substances; the contractor shall undertake to dispose of, at his own cost, all equipment and plant supplied under the contract.

The contractor is required to dispose of any waste in a manner which does not harm the environment.

3.5 Roles and Responsibilities

The contractor shall implement mitigation and monitoring measures under the direct supervision of the Project Engineer (PE). The contractor is also responsible for the systematic and periodic monitoring of environmental and social aspects. The contractor/proponent environmental and social management officer shall be assigned responsibility to oversee the implementation of the mitigation and monitoring measures. The contractor/project proponent shall ensure that all the identified potential environmental and social parameters and variables are monitored in order to get sufficient data and information to reveal the trend(s) or performance of the project. In summary the responsibilities are as follows:

3.5.1 Project Engineer

The primary responsibility of the Project Engineer (PE) is to ensure that the contractor complies with the environmental specifications in this ESMP. The PE shall:

- Assume overall responsibility for the effective implementation and administration of the ESMP
- Ensure that the ESMP is included in the contractors contract
- Ensure that the ESMP is given to the applicable construction supervisor and contractors
- Undertake regular inspections of the contractor's site as well as the construction works in order to check for compliance with the ESMP in terms of the specifications outlines in this document. Inspections using a checklist shall take place at least twice a month and the monitoring checklist maintained on file
- Keep a resister of major incidents (spills, injuries, complaints, legal transgressions, etc) and other documentation related to the ESMP
- Report to the Environmental Unit TANESCO Head Office any problem (or complaints) which cannot first be resolved in cooperation with the contractor

- Implement recommendations of possible audits
- Ensure construction staffs are trained in accordance with requirements of the ESMP
- Inform all relevant stakeholders of the date of construction at least one week in advance

3.5.2 Contractor

The construction contractor will have big responsibility of ensuring that environmental and social impacts are mitigated. The contractor shall:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented.
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections
- Discuss implementation of and compliance with this document with staff at routine site meetings
- Report progress towards implementation of and no-conformances with this document at site meeting with the project engineer
- Ensure that suitable records are kept and that the appropriate documentation is available to the project engineer
- Advise the project engineer of any incidents or emergencies on site, together with a record of action taken
- Report and record all accidents and incidents resulting in injury or death

TANESCO is planning to work with district experts and the National Environment Management Council (NEMC) during implementation and monitoring exercise.

3.6 Environmental Training

Implementation of environmental and social management and monitoring plans need a good knowledge on environmental management and monitoring. Therefore it is very important that all those who will be involved directly in planning and managing construction are equipped with environmental management tools. Some will need awareness raising training on social aspects while others will need training on specific environmental and social parameters. Project engineer and contractor shall ensure that training on health and safety awareness is conducted before workers are allowed to move to the site.

Supervision of the ESMP will be initiated through a capacity building programme for TANESCO staff (Environmental Unit, and Kilimanjaro Regional Office), NEMC and the Moshi District Environmental Coordinator in their role in the project monitoring and control. The programme will comprise a one day formal course prior to commencement of construction. The course content will include all aspects of the ESMP.

3.7 Commitment and Financial Resources

Implementing and monitoring of these environmental mitigation measures will need financial resource commitment from the project proponent. This means some funds shall be set aside for implementing the mitigation measures and monitoring tasks while

other environmental mitigation imbedded in the design shall be included in the construction costs. The expected costs include costs for monitoring, awareness raising (health, environmental and training), compensation and capacity building costs.

3.8 Reporting

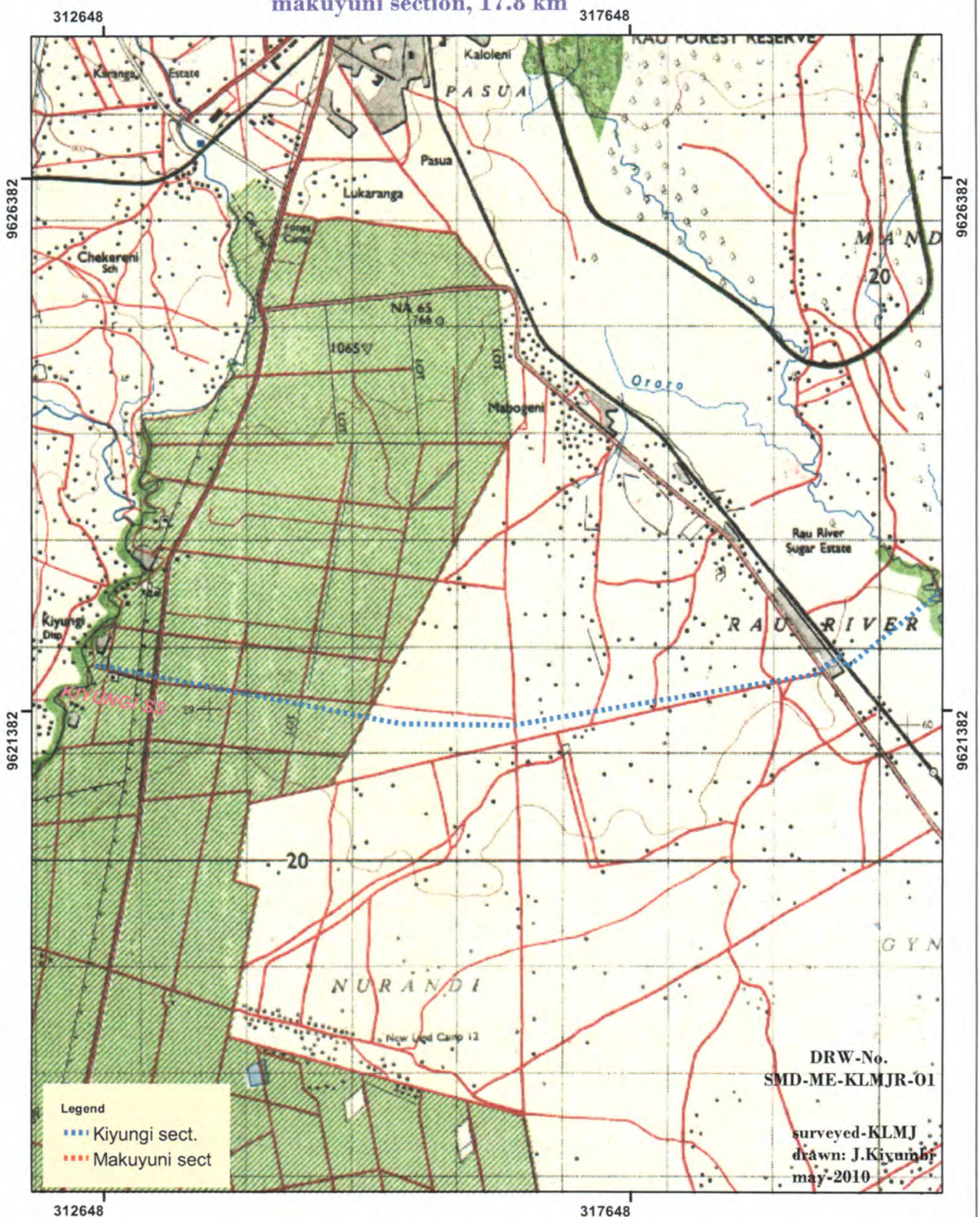
Monitoring reports will be prepared and submitted to relevant bodies including Ministry of Energy, NEMC and Moshi District.

sheet-01/04

POWER IMPROVEMENT IN KILIMANJARO REGION

OVER-VIEW

Proposed Kiyungi-Makuyuni_66kV-line.
kiyungi section, 13 km
makuyuni section, 17.8 km

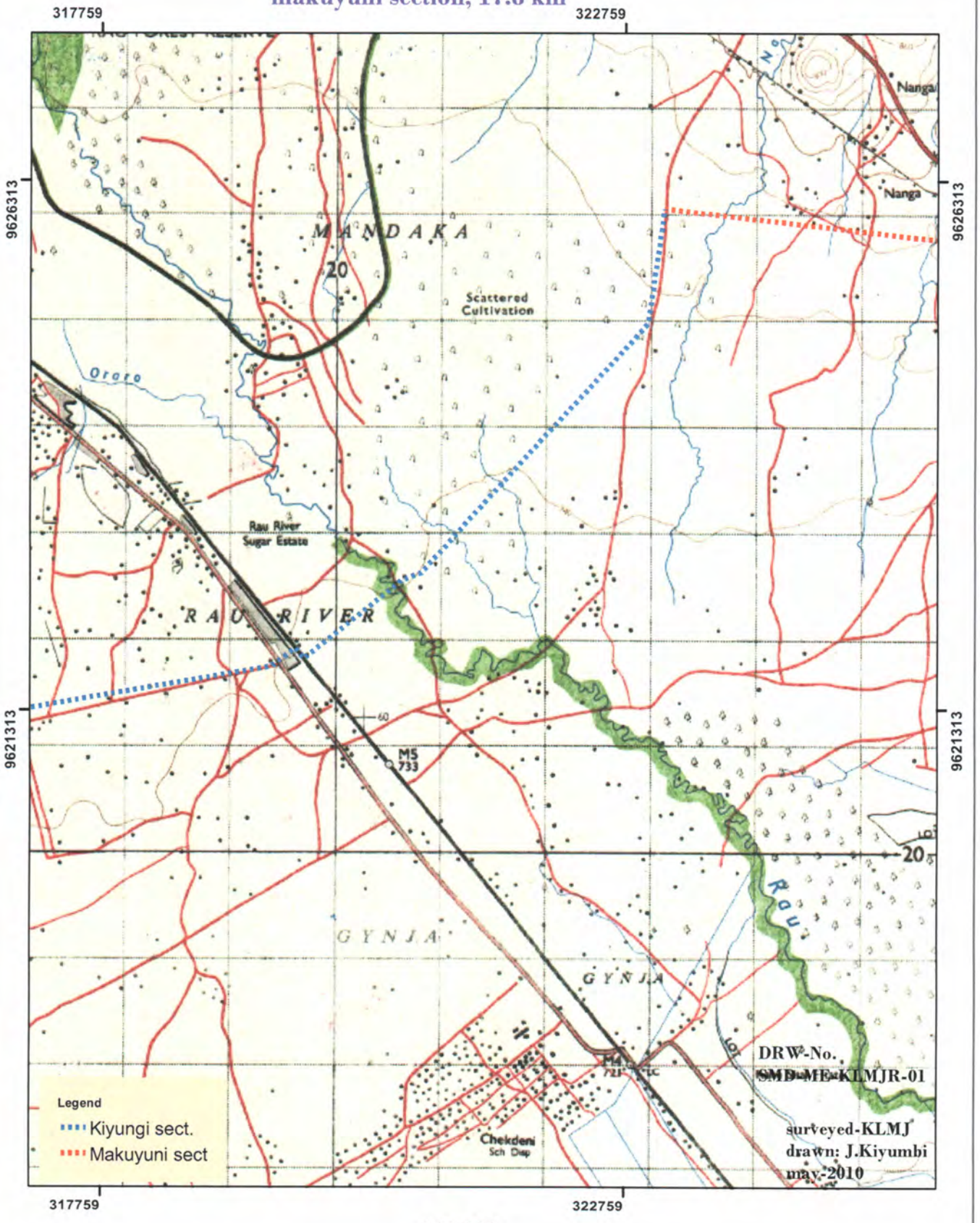


sheet-02/04

POWER IMPROVEMENT IN KILIMANJARO REGION

OVER-VIEW

Proposed Kiyungi-Makuyuni_66kV-line.
kiyungi section, 13 km
makuyuni section, 17.8 km

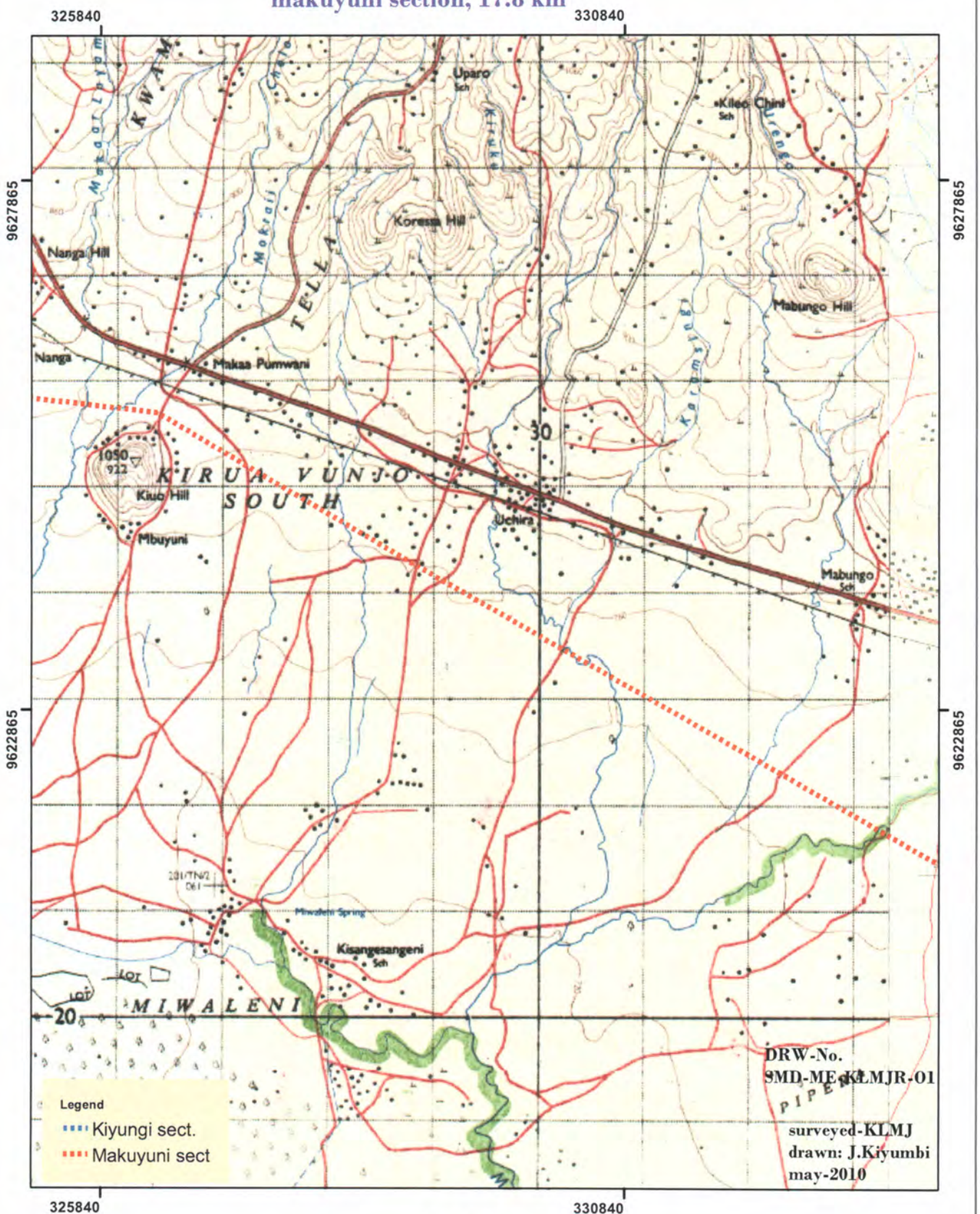


sheet-03/04

POWER IMPROVEMENT IN KILIMANJARO REGION

OVER-VIEW

Proposed Kiyungi-Makuyuni_66kV-line.
kiyungi section, 13 km
makuyuni section, 17.8 km

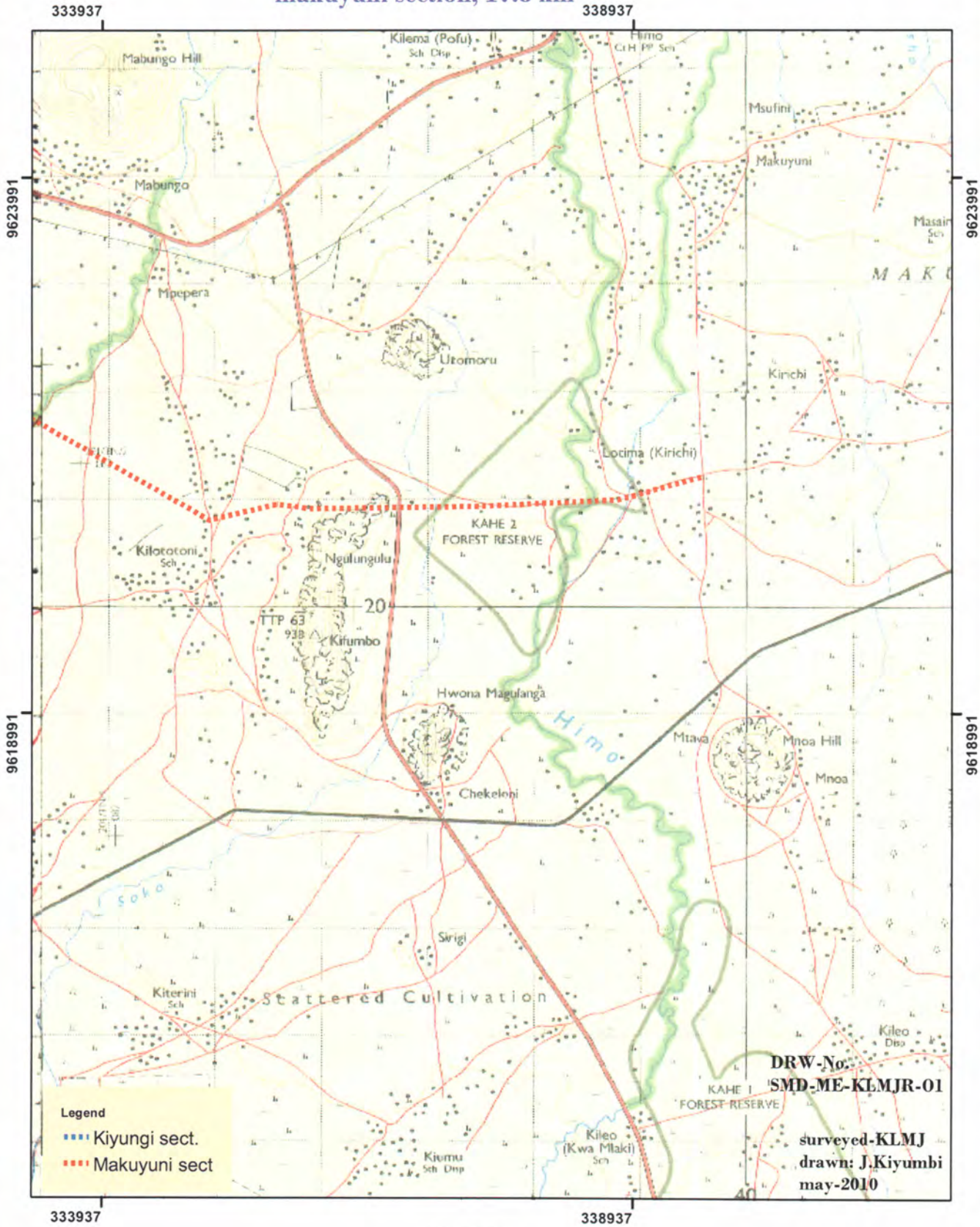


sheet-04/04

POWER IMPROVEMENT IN KILIMANJARO REGION

OVER-VIEW

Proposed Kiyungi-Makuyuni_66kV-line.
kiyungi section, 13 km
makuyuni section, 17.8 km



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Appendix 6 Reporting letter on Screening decision

6. Reporting letter on Screening decision

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL (NEMC)

BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA

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- 8 JUL 2010

RECEIVED
- 8 JUL
INITIALS
TANESCO

In reply please quote:
Ref: **NEMC/04/20/Vol. V/21**

Date: **06/07/2010**

Managing Director,
TANESCO Ltd,
P.O. Box 19024,
Dar-es-Salaam. (Att: Felician Mayila)

RE: SCREENING DECISION ON THE PROPOSED REHABILITATION OF SUBSTATIONS AND CONSTRUCTION OF TRANSMISSION LINE IN KILIMANJARO REGION

The above subject matter refers.

We acknowledge receipt of your letter Ref. SMSPP/MRE/EIA/19 of 4th June 2010 attached with three copies of dully filled EIA Registration forms and ten copies of Project Brief for the above mentioned undertaking. We have reviewed the documents and found that, this project falls in the list for which EIA study is mandatory.

In this regard, you are required to prepare a scoping report and draft Terms of Reference (ToR) for undertaking the EIA and submit them to the Council for review and approval before conducting the EIA study.

We look forward to your cooperation on this matter.

F. C. N. Rugiga
For Director General

Appendix 7 Scoping Report from MEM

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL (NEMC)

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TANZANIA

In reply please quote:

Ref:..... **NEMC/04/20/Vol. 1V/28**

Date:..... **9/09/2010**

Managing Director,
TANESCO Ltd,
P.O. Box 19024,
Dar-es-Salaam. (Att: D.P.Mhaiki)

RE: SCOPING REPORT ON THE PROPOSED REHABILITATION OF SUBSTATIONS AND CONSTRUCTION OF TRANSMISSION LINES IN KILIMANJARO REGION

The above subject matter refers.

We acknowledge receipt of your letter Ref. SMSPP/MRE/EIA/19 of 31st August 2010 attached with two copies of the scoping report on the above mentioned undertaking. We have reviewed the above document and found that they have taken most of environmental and social issues, and that the ToR can be used for undertaking detailed Environmental Impact Assessment study.

However, we have some comments which you will be required to work on for improvement and re-submit a copy of the same to the Council for record.

Should there be a need for further clarification or information on the EIA process please contact us on Telephone no. 0754 311592.

F.C.N.Rugiga
For Director General

All correspondence

Appendix 8 Submission Report on Environmental and Socio Impact Assessment (ESIA)

"Tunaye-angaza Maisha Yako" TANESCO "We Light Up Your Life"

SHIRIKA LA UMEME TANZANIA
TANZANIA ELECTRIC SUPPLY COMPANY LIMITED

Ubungo Head Office, "Umeme Park", P.O.Box 9024 Dar Es Salaam, Tanzania. Tel: +255 22 2451130/9. Fax: +255 22 2452026

Our Ref: **SMSPP/MRE/EIA/19**

Date: **14th Jan 2011**

The Director General
National Environment Management Council
Dar Es Salaam

RECEIVED 19/1/2011
DATE
NATIONAL ENVIRONMENT
MANAGEMENT COUNCIL
DAR - ES - SALAAM

Dear Sir,

RE: REHABILITATION OF SUBSTATIONS AND TRANSMISSION LINE CONSTRUCTION PROJECT IN KILIMANJARO REGION

Subject: - Environmental and Socio Impact Assessment (ESIA) Report Submission

Reference is made to the Environmental Management Act, 2004 (No. 20 of 2004) of which required that the ESIA report is to be reviewed by Technical Advisory Committee (TAC).

Attached herewith are fifteen (15) copies of draft final version of the ESIA report for the above-mentioned project for your further decisions.

Thank you for your continued warm co-operation.

Yours faithfully,
For: **TANZANIA ELECTRIC SUPPLY COMPANY LIMITED.**

Decklan P. Mhaiki
For: **MANAGING DIRECTOR**
GMT/DPM/YRK

Appendix 9 Matrix of Entitlement

Matrix of Entitlement

Category of Displaced Persons	Type of Loss	Entitlement				
		Compensation for Loss of Land	**Compensation for Loss of Structures and Assets**	**Compensation for Loss of Profit or Income**	**Allowances**	**Assistance**
Owners of farms or plots with houses and other buildings in ROW (or Way Leave)	Loss of land	Compensation at market value. As far as possible PAPs (Project Affected Persons) will be allowed to continue farming certain crops within the ROW after construction of the transmission line		Standing crops: Compensation at capitalized annual average value	Disturbance allowance at 4% - 6% of land value	Project assistance to locate and negotiate replacement land if requested Land preparation cost included in land value
	Loss of residential and other buildings		Compensation at replacement cost		Accommodation allowance equivalent to 36 months rent for the displaced house Transport allowance at cost to move 12 t for 20 km	Project assistance with organizing and supervising construction of replacement houses and buildings if requested
Owners of farms or plots with non-residential buildings in ROW	Loss of land	Compensation at market value. As far as possible PAPs will be allowed to continue farming certain crops within the ROW after construction of the transmission line		Standing crops: Compensation at capitalized annual average value	Disturbance allowance at 4% - 6% of land value	Project assistance to locate and negotiate replacement land if requested Land preparation cost included in land value
	Loss of buildings		Compensation at replacement cost			Project assistance with organizing and supervising construction of replacement buildings if requested
Owners of farms or plots without buildings in ROW	Loss of land	Compensation at market value. As far as possible PAPs will be allowed to continue farming certain crops within the ROW after construction of the transmission line		Standing crops: Compensation at capitalized annual average value	Disturbance allowance at 4% - 6% of land value	Project assistance to locate and negotiate replacement land if requested Land preparation cost included in land value

Appendix 10 Example of an Agreement for Land Selling

AGREEMENT FOR LAND SELLING.
Selling of the Land / Agreement

HATI YA UTHIBITISHO WA MAUZO NA UNUNUZI

1. Mimi **BENJAMIN PHILIP KARENGI** wa sanduku la barua 224, HIMO – KILIMANJARO nathibitisha kwamba ni mmiliki halali wa **kiwanja Na. 1200 kilichopo KITALU "F", MJI WA HIMO WILAYA YA MOSHI**.

2. Nakubali kumuuzia **GODSON JONATHAN MATERU** wa sanduku la barua 3010, MOSHI kiwanja Na. 1200 kilichopo KITALU "F", MJI WA HIMO WILAYA YA MOSHI na kwamba GODSON JONATHAN MATERU amekubali kununua kiwanja hiki kwa bei itakayoonyeshwa hapa chini.

3. Mimi GODSON JONATHAN MATERU wa sanduku la barua 3010, MOSHI nakubali kununua kiwanja Na. 1200 kilichopo KITALU "F", MJI WA HIMO WILAYA YA MOSHI kwa bei itakayoonyeshwa hapa chini.

Price for the Plot:

4. BEI YA KIWANJA HIKI NI **SHS. 2,300,000/= (SHILINGI MILIONI MBILI LAKI TATU TU).**

Payment Regulations

5. **UTARATIBU WA MALIPO NI KAMA IFUATAVYO:**

(i) Mnunuzi amekubali kulipa fedha zote yaani (Shs. 2,300,000/=) Shilingi milioni mbili na laki tatu tu kwa mara moja (awamu moja tu).

(ii) Muuzaji amekubali kulipwa fedha hizo kwa awamu hiyo moja na kuthibitisha kwamba hatadai tena malipo mengine yeyote yale ya ziada kuhusiana na kiwanja Na. 1200 kilichopo KITALU "F", MJI WA HIMO WILAYA YA MOSHI.

Surrendering agreement. / offer ?

6. **UTHIBITISHO WA KUKABIDHI OFA YA KIWANJA**

Mimi BENJAMIN PHILIP KARENGI wa sanduku la barua 224, HIMO namkabidhi nakala halisi (original) ya barua ya ofa ya kiwanja Na. 1200 KITALU "F", kilichopo MJI WA HIMO WILAYA YA MOSHI Ndugu GODSON JONATHAN MATERU wa sanduku la barua 3010, MOSHI – KILIMANJARO, kwa gharama zilizotajwa katika makubaliano haya, na sina kipingamizi cha yeye kubadilishiwa ofa ya kiwanja hiki kwa jina lake. Naahidi kushirikiana naye katika kubadilisha ofa hii kikamilifu.

Acceptance of payments amount.

7. **UTHIBITISHO WA MALIPO**:

(i) Mimi BENJAMIN PHILIP KARENGI wa sanduku la barua 224, HIMO – KILIMANJARO nimepokea leo tarehe 08 mwezi Julai mwaka 2008 fedha taslim Shs. 2,300,000/= (Shilingi milioni mbili laki tatu tu) kutoka kwa NDUGU GODSON JONATHAN MATERU wa sanduku la barua 3010, MOSHI – KILIMANJARO zikiwa ni malipo kwa ajili ya ununuzi wa kiwanja Na.1200 – KITALU "F" MJI WA HIMO WILAYA YA MOSHI.

Name of the seller

8. **JINA LA MUUZAJI:** PHILIP. A. KARENGI **TAREHE:** 08-07-2008

~~Name of the buyer~~

SAHIHI YA MUUZAJI _____ (Signature)

Witness of the seller

SHAHIDI WA MUUZAJI: CHARLES N. KIMARO **TAREHE:** 08. 07 - 2008

Witness Signature

SAHIHI YA SHAHIDI: _____

Name of the buyer

9. **JINA LA MNUNUZI:** GODSON J. MATERU **TAREHE:** 08/07/2008

Signature of the buyer

SAHIHI YA MNUNUZI _____

Witness of the buyer

SHAHIDI WA MNUNUZI: FELIX TOUWO MGHASE **TAREHE:** 08/07/2008.

Witness Signature

SAHIHI YA SHAHIDI: _____

Appendix 11 Scoping Summary

Summary of the Preparatory Survey for Grant Aid

1. Title of the Project

The Project for Rehabilitation of Substation and Transmission Line in Kilimanjaro Region in the United Republic of Tanzania (hereinafter referred to as "the Project")

2. Categorization and its Reason

Category B

Reasons: The Project is composed of upgrading of existing substations, construction of new substations, and construction of transmission and distribution lines. Regarding the construction and upgrading of substations, the adverse impacts on the environment and society are not significant because those scales are not large and the adverse impacts from the project activities can be avoided or minimized by normal mitigation measures, while there is requirement of land acquisition and land clearance. As for the construction of transmission and distribution lines, the adverse impacts on the environment and society are also not significant, because the most of the transmission pylons and distribution poles are erected on farm land or vacant land.

3. Outline of the Location

3.1 Geographical Features

The United Republic of Tanzania is located on the east coast of Africa, and lies between 29°30'E and 40°30'E, and 1°00'S and 11°48'S. It has an area of approximately 945,000 km^2 which includes the three major coastal islands of Mafia, Pemba and Zanzibar. The country is bordered by Uganda to the north, Rwanda and Burundi to the north-west, the Democratic Republic of Congo to the west, Zambia and Malawi to the south-west, Mozambique to the south, and Kenya to the north-east, as shown in **Figure 1**. The geography is characterized by plains along the coast, a central plateau, and highlands in the north and south. Those altitudes range from sea level to the highest point of Africa, the glaciated peak of Kilimanjaro at 5,895 m.

The Project is planned in the administrative region of Kilimanjaro which is located on the border with Kenya and consists of six administrative districts: Moshi Urban (58 km^2), Moshi Rural (1,713 km^2), Hai (2,111 km^2), Rombo (1,422 km^2), Same (5,186 km^2) and Mwanga (2,698 km^2). The regional administration is headquartered in Moshi Urban.

3.2 Population

The total population of Tanzania enumerated in the 2002 Population and Housing Census was 34.4 million, of which 33.5 million or 97.1 percent were in Tanzania Mainland and 982,000 or 2.9 percent in Tanzania Zanzibar. The average annual rate of growth during the most recent inter-census period of 14 years from 1988 to 2002 was 2.9 percent, and the population density was 36.5 inhabitants per km^2 in 2002.

On the other hand, the total population of Kilimanjaro Region was 1,377 thousands or 4 percent of the total population of Tanzania in 2002. The average annual rate of growth during the same period was 1.6 percent which was lower than the national level. The population density was 104.4 inhabitants per km^2 in 2002.

3.3 Climate and Hydrology

Tanzania experiences a variety of climatic conditions, ranging from the alpine deserts on the top slopes of Mt. Kilimanjaro that are permanently covered by snow, to the tropical coastal areas that are under the influence of two monsoon winds. Average annual precipitation over the entire nation is 1,042 mm, and average temperatures range between 17°C and 27°C depending on location.

The average temperatures in Moshi town vary between 21°C and 27°C, and the annual rainfalls in recent years were 606 mm in 2007, 1,047 mm in 2008 and 801 mm in 2009.

The project sites are located in the administrative districts of Moshi Urban and Moshi Rural within the Pangani River Basin which is one of the major river basins of Tanzania Mainland. The Pangani River Basin covers 43,650 km^2, and supplies water to the administrative regions of Tanga, Kilimanjaro and Arusha, supporting a number of important economic activities.

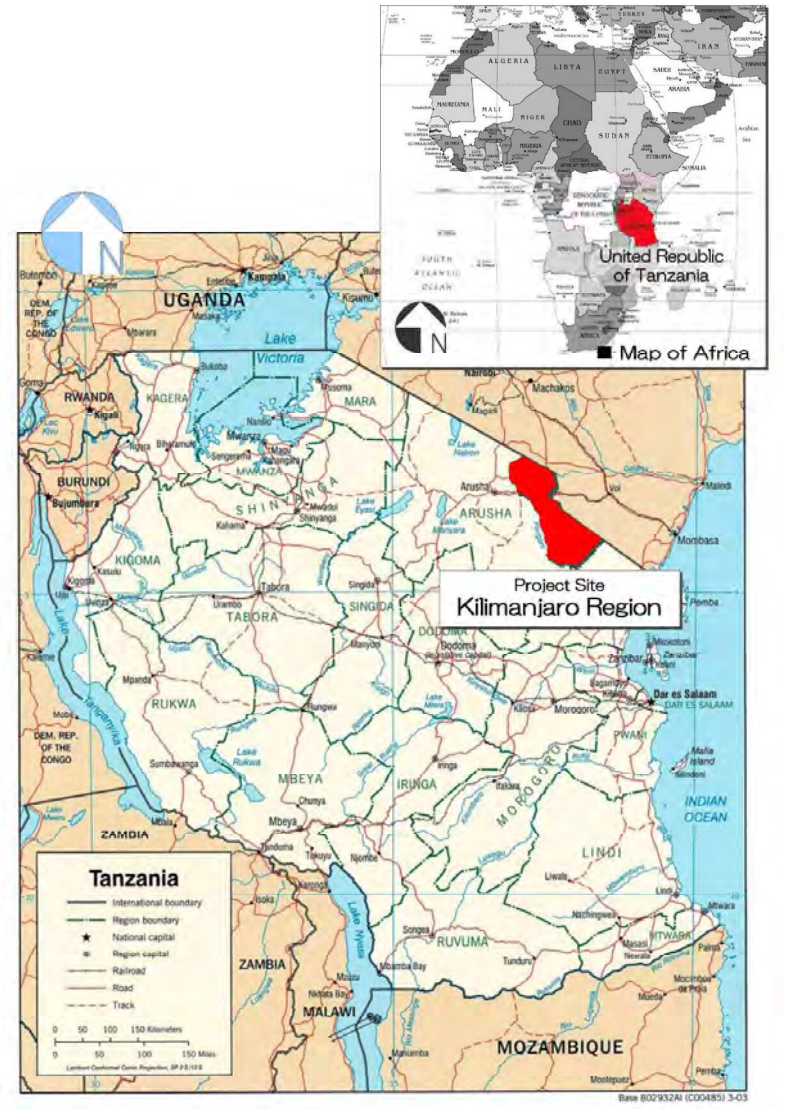

Figure 1 Object Region of the Project

4. Institutional and Administrative Structure for EIA in Tanzania Mainland

4.1 Ministry of Environment

The Ministry of Environment, which is under the jurisdiction of the Office of the Vice-President, is responsible for overall environmental management and protection on the Tanzanian Mainland.

4.2 The National Environmental Management Council (NEMC)

The National Environmental Management Council (NEMC) was initially established in 1983, and its composition, powers and functions were redefined in Part III (d) of the Environmental Management Act of 2004 (EMA 2004). The NEMC is responsible for undertaking enforcement, compliance, review and monitoring of Environment Impact Assessment (EIA), including facilitation of public participation

in environmental decision making. Regarding EIA procedure, the NEMC carries out screening for registered projects which are likely to have a significant impact on the environment, as well as review of EIA documents, giving advice on issuing of environmental permit to the Minister and evaluation of environmental auditing report (EAR).

4.3 The National Environmental Advisory Committee (NEAC)

The composition, powers and functions of the National Environmental Advisory Committee (NEAC) were set out in Part III (a) of the EMA 2004. The NEAC, which is composed of members reflecting various fields of environmental management from the public and private sectors and civil society, is an advisory body to the Minister on all matters relating to the protection and management of the environment.

4.4 Director of Environment

The Director of Environment is set up within the Ministry. Part III (c) of the EMA 2004 sets out the roles and responsibilities for the Director of Environment as follows:

- Coordination of various environment management activities being undertaken by other agencies;
- Promotion of the integration of environment considerations into development policies, plans, programs, strategies and projects through the use of strategic environmental assessment (SEA);
- Offering of advice to the Government on legislative and other measures for the management of the environment or the implementation of the relevant international agreements in the field of environment;
- Preparation and issue of a report on the state of the environment in Tanzania; and others.

4.5 Cross-sectoral Technical Advisory Committee

The NEMC sets up cross-sectoral technical advisory committee consisting of not less than twelve specialists constituting a multi-disciplinary specialization from the sector Ministries in order to take their advice on reviews of environmental impact assessment related reports.

4.6 Environmental Section in each sector Ministry

Functions and duties of environmental section in each Ministry are defined by Part III (e) of the EMA 2004 as follows:

- Ensuring compliance by the line ministry with the EMA 2004;
- Ensuring all environmental matters contained in other laws falling under the sector Ministry; and
- Liaising with the Director of Environment and NEMC on all environmental matters in order to achieve cooperation on shared responsibility for environmental governance.

4.7 Regional Secretariat

The Regional Secretariat is responsible for coordination of all advice on environmental management in their respective regions and liaison with the Director of Environment and the Director-General of the NEMC on the implementation and enforcement of the EMA 2004. Within the Regional Secretariat, a person to be known as the Regional Environmental Management Expert, who is responsible for advising the local authorities on matters relating to the implementation and enforcement of the EMA 2004, is appointed or designated by the Minister responsible for regional administration.

4.8 Local Government Authorities

Under the EMA 2004, each City, Municipal, District and Town Council appoints an Environmental Management Officer and establishes an Environmental Management Committee. The responsibilities of the Environmental Management Officer are mainly as follows:

- Enforcement of the EMA 2004 in his/her area of responsibility;
- Offering of advice to the Environmental Management Committee on all matters relating to

environment;
- Promotion of environmental awareness regarding the conservation and utilization of natural resources;
- Collection and management environmental information;
- Preparation of periodic reports on state of the local environment; and
- Monitoring of the preparation, review and approval of EIAs for local investments.

The responsibilities of the Environmental Management Committee are mainly as follows:

- Inquiries and investigations about any allegation relating to environment;
- Resolution of conflicts among individual persons, companies, agencies, non governmental organizations, Government departments or institutions about their respective functions, duties mandates, obligations or activities under the EMA 2004;
- Inspection and examination of any premises, street, vehicle, aircraft or any other place or article which is believed to have cause of pollution;
- Mandate to any person to remove at own cost any article or substance from any place of which article or substance is believed to be safely kept or destroyed without causing harm to health; and
- Proceeding of civil or criminal action against any person, company, agency, department or institution that fails or refuses to comply with requirements of the Committee.

In the same way, each Township, Ward, Village, Mtaa and Kitongoji establishes a development committee and designates an Environment Management Officer to manage the natural resources of their areas and to ensure compliance with the EMA 2004. However, these lower tiers of local administration do not have any responsibility for the EIA process.

5. Policy and Legal Framework for EIA in Tanzania Mainland

5.1 Policy and Legal Framework

(1) National Environmental Policy

The National Environmental Policy (NEP), which was adopted in 1997, seeks to provide the framework for making fundamental changes that are needed to bring environmental considerations into the mainstream of decision making in Tanzania. The NEP seeks to provide guidance and planning strategies in determining how actions should be prioritized, and provides for the monitoring and regular review of policies, plans and programs. It further provides for sectoral and cross-sectoral policy analysis in order to achieve compatibility among sectors and interest groups and exploit synergies among them. The overall objectives of the NEP are, therefore, the following:

- To ensure sustainability, security and equitable use of resources for meeting the basic needs of the present and future generations without degrading the environment or risking health and safety;
- To prevent and control degradation of land, water, vegetation and air which constitute our life support systems;
- To conserve and enhance our natural and man-made heritage, including the biological diversity of the unique ecosystems of Tanzania;
- To improve the conditions and productivity of degraded areas including rural and urban settlements in order that all Tanzanians may live in safe, healthful, productive and aesthetically pleasing surroundings;
- To raise public awareness and understandings of the essential linkages between environment and development, and to promote individual and community participation in environmental action; and
- To promote international cooperation on the environment agenda, and expand our participation and contrbution to relevant bilateral, sub-regional, regional, and global organizations and programs, including implementation of treaties.

(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 4th 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
Forth 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

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

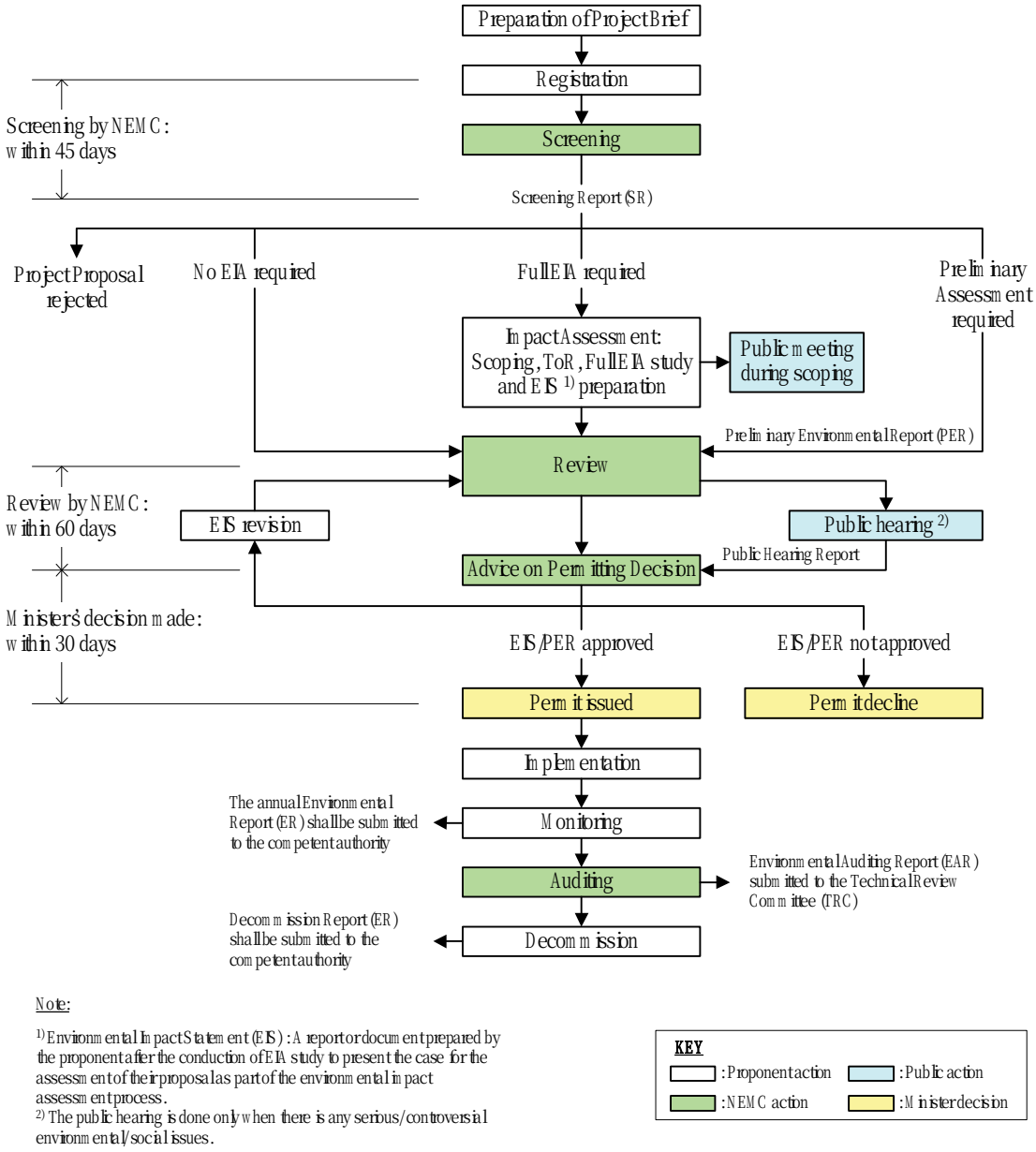

Figure 2 EIA Procedure in Tanzania Mainland

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;

- 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

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: • 33kV Incoming switchgear panel with VCB (1 No.) • 33/11kV, 15MVA Transformer with On-load Tap-changer (1 No.) • 11kV Switchgear panel (6 Nos.) • 33kV Cable and end treatment material (1 Lot) • 11kV Cable and end treatment material (1 Lot)
	Lawati	Installation of: • 33kV Incoming switchgear panel with VCB (1 No.) • 33/11kV, 10MVA Transformer with On-load Tap-changer (1 No.) • 11kV Switchgear panel (6 Nos.) • 33kV Cable and end treatment material (1 Lot) • 11kV Cable and end treatment material (1 Lot)
	Machame	Installation of: • 33kV Incoming switchgear panel with VCB (1 No.) • 33/11kV, 10MVA Transformer with On-load Tap-changer (1 No.) • 11kV Switchgear panel (6 Nos.) • 33kV Cable and end treatment material (1 Lot) • 11kV Cable and end treatment material (1 Lot)
	Trade School	Installation of (33kV Outgoing bay): • 33kV Outgoing switchgear panel with VCB (1 No.) • 33kV Cable and end treatment material (1 Lot)
	Kiyungi	Installation of (66kV Outgoing bay): • 33kV Incoming switchgear panel with GCB (1 No.) • 66kV Control panel (1 No.) Installation of (132/66kV, 20MVA Transformer): • 132/66kV, 20MVA transformer with On-load tap changer (1 No.) • 132kV switchgear (1 Lot) • 66kV switchgear (1 Lot) • 132kV Control and protection panel (1 No.) • 66kV Control and protection panel (1 No.)
Construction of New Substations	KCMC	Installation of: • 33kV Incoming switchgear panel with VCB (3 No.) • 33/11kV, 10MVA Transformer with On-load Tap-changer (1 No.) • 11kV Switchgear panel (6 Nos.) • 33kV Cable and end treatment material (1 Lot) • 11kV Cable and end treatment material (1 Lot)
	Makuyuni	Installation of: • 66kV Incoming line bay with GCB, etc. (1 No.) • 66kV Transformer bay (2 Lots) • 66/33kV, 10MVA Transformer with On-load Tap-changer (2 Nos.) • 33kV Switchgear panel (7 Nos.) • 66kV Control and protection panel (3 Nos.) • 33kV Control and protection panel (6 Nos.) • DC Supply equipment (1 Set) • 66kV Conductor (1 Lot) • 33kV Cable and end treatment material (1 Lot)
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

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

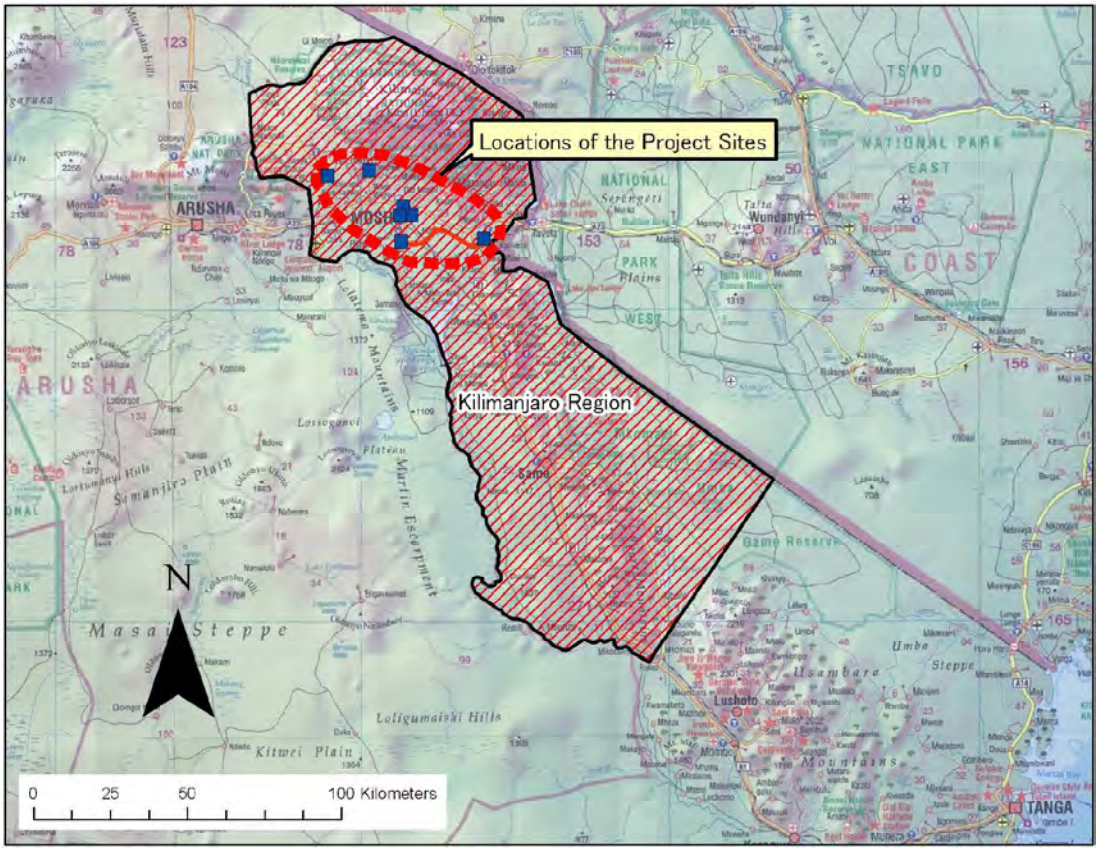

Figure 3 Locations of the Project Sites (1/2)

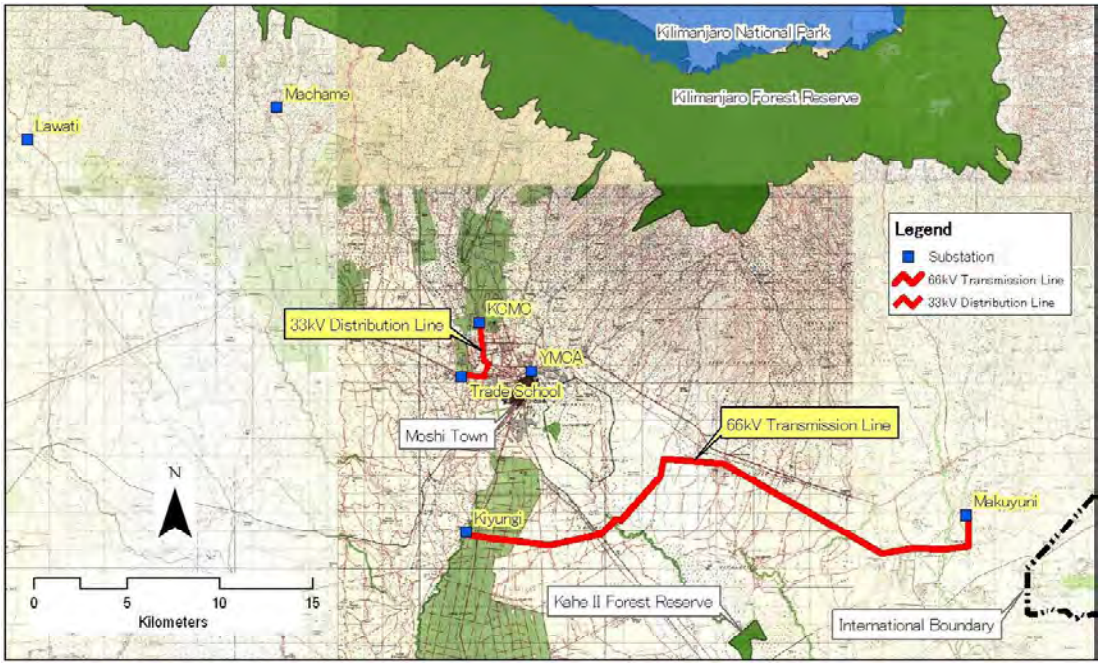

Figure 4 Locations of the Project Sites (2/2)

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.

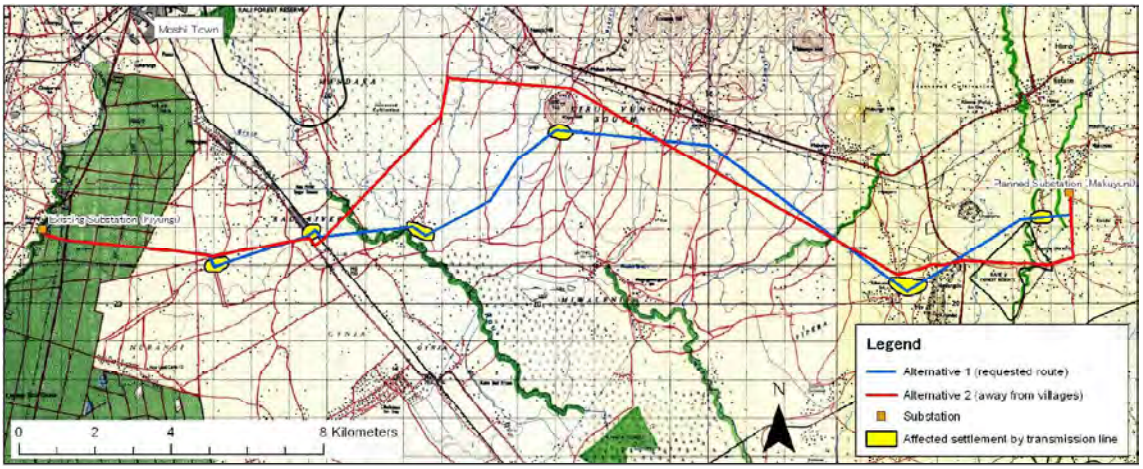

Figure 5 Alternatives for 66kV Transmission Line

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	● A certain degree of adverse impacts such as loss of agricultural products ● Improvement of regional community in terms of employment, public services, etc.	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 valuated 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								
				Const. Phase			Operation Phase				
	No.	Likely Impacts	Overall Rating	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.	Description
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									Alternation 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. EE/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

Appendix 12 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.

Appendix 13 Summary of Environmental and Social Monitoring Plan

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
CONSTRUCTION PHASE MONITORING				
Monitoring of sanitary facilities at construction site	- Presence of toilets - Waste collection and disposal plan and sites	- Once at establishment of construction site - one day every two months	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	- Absence of oil spills - oil collecting points earmarked - clear instruction on how to handle hydrocarbons	- Once at establishment of workshop or work site once every two months	TANESCO in cooperation with District Environmental Officer	1,000 USD, costs to be covered by TANESCO
Monitoring of noise emissions	- measurement of noise levels to compare with standard levels of 45dB(A) during the night and 70dB(A) during the day	- As needed but every three months	TANESCO in cooperation with District Environmental Officer	2,500 USD, costs to be covered by TANESCO
Monitoring of waste handling and disposal	- Time table for collecting wastes for disposal - Number of waste collecting bins - Disposal sites and disposal plan - premise cleanness - water quality standards	- Every three months	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	- Check number people including youths employed by the project. - Paid salaries - Check no child labour	Once a month	TANESCO, Labour office and contractor	3,000 USD, costs to be covered by TANESCO
Safety: - Setting warning signs of dangers and traffic - Provision of safety gears - Awareness of the potential dangers - Avail safety procedures to workers	Check: - the Level of awareness - Type of safety gear provided - Presence of warning signs - Working procedures in place	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 - Control the number of job seekers - Improve security measures	- Monitor increase in the number of lawlessness and breaking incidences (thefts, killing, fights, etc.) from local offices and police stations	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;	- number of illness cases - number of awareness campaigns made - number of ARV given - number of condoms distributed - number of awareness material given - understanding and material given)	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	- Trespasses to private land other than the way leave corridor.	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	- Every PAP is paid - Grievances attended and solution sought	Throughout the compensation process	TANESCO in collaboration with the District and local leaders	10,000 cost to be covered by TANESCO
LONG TERM / OPERATIONAL MONITORING	-			
Monitoring of potential impacts on health and	- number of illness cases among TANESCO employees and	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 Providence of safety gears - 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
DECOMMISSIONING PHASE				
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

Appendix 14 ENVIRONMENTAL MONITORING FORM

14. ENVIRONMENTAL MONITORING FORM

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.)
• Absence of oil spills • Oil collecting points • Instruction on how to handle hydrocarbons	• Once at establishment of construction site • Once every two months

(2) Noise

Monitoring Item	Remarks (Measurement Point, Frequency, etc.)
• Measurement of noise levels to compare with the following country's standards - 45dB during night - 70dB during day	• As needed but every three months at the nearest residence

2. Operation Phase

Not applicable