Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

➢ TANESCO should establish a mechanism to deal with complaints and grievances of affected people and to provide correct information (information dissemination)

➢ TANESCO should deal with people who are still living under the transmission line and within the Right of Way of the existing Moshi (Kiyungi) – Arusha (Njoro) transmission line for the safety of the people and the smooth operation of the line

➢ TANESCO should consider supplying electricity to the villages such as Samaria, Kikwe, etc., which are among the affected villages in Moshi – Arusha T/L so that villagers see the value of electricity development and to instil the ownership of the project

➢ During construction the project should consider improving road infrastructure in the villages that are affected by the project as part of the access road improvement and or as part of project contribution to village development. Otherwise the project should consider improving health facilities in the project area whereby they will serve both project workers and the villagers
<table>
<thead>
<tr>
<th>Typical Monitoring Frequency</th>
<th>Monitoring Location</th>
<th>Responsible Body</th>
<th>Tentative Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous</td>
<td>Transmission line corridor, substations, official gazette</td>
<td>Consultant Contractor and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>Yearly</td>
<td>Substations</td>
<td>TANESCO / NEMC</td>
<td>4,000</td>
</tr>
<tr>
<td>Monthly and yearly during operation</td>
<td>Substations – control rooms and substations yards</td>
<td>TANESCO – Regional offices TANESCO HQ NEMC</td>
<td>Regional office budget and as item 2.1</td>
</tr>
<tr>
<td>Quarterly</td>
<td>Transmission line corridor</td>
<td>Districts TANESCO / NEMC</td>
<td>2,000</td>
</tr>
<tr>
<td>Yearly</td>
<td>New resettlement areas</td>
<td>NEMC TANESCO</td>
<td>10,000</td>
</tr>
<tr>
<td>Monthly</td>
<td>Work sites and</td>
<td>Consultant</td>
<td>5,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical Monitoring Frequency</th>
<th>Monitoring Location</th>
<th>Responsible Body</th>
<th>Tentative Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily during construction</td>
<td>Transmission line corridor and on Sub station, campsites and storage sites</td>
<td>Contractor / TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>Daily when the construction gang crossing the river, Then Monthly</td>
<td>Transmission line – corridor</td>
<td>Contractor, Consultant and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>Weekly</td>
<td>Transmission line corridor and on Sub station area</td>
<td>Contractor, Consultant and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>Daily during construction</td>
<td>Transmission line corridor and access roads</td>
<td>Consultant Contractor and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>Daily during construction</td>
<td>Transmission line corridor and on Sub station area</td>
<td>Consultant Contractor and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>Daily during construction</td>
<td>Transmission line – corridor and on Sub station area</td>
<td>Consultant Contractor and TANESCO</td>
<td>NIL</td>
</tr>
</tbody>
</table>
### Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

<table>
<thead>
<tr>
<th>S/N</th>
<th>Impact</th>
<th>Monitoring Action</th>
<th>Typical Monitoring Frequency</th>
<th>Monitoring Location</th>
<th>Responsible Body</th>
<th>Tentative Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>facilities</td>
<td></td>
<td>substations</td>
<td>TANESCO</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Ensure regular medical check up is done</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4.3</td>
<td>Sexually transmitted diseases, HIV/AIDS and other diseases</td>
<td>- Monitor number of new infections</td>
<td>Monthly</td>
<td>Work place</td>
<td>Consultant</td>
<td>1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Monitor preventive measures in place</td>
<td></td>
<td></td>
<td>TANESCO</td>
<td></td>
</tr>
<tr>
<td>2.4.4</td>
<td>Education and training</td>
<td>- Monitor training records</td>
<td>Yearly</td>
<td>workplace</td>
<td>TANESCO</td>
<td>15,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Monitor level of awareness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>Compliance with Laws, Regulations, Conventions, policies and standards - local and international (WB)</td>
<td>- Monitor the compliance to all relevant Government permits, National or International legislations and guideline requirements. - Monitor information flow and reporting to all relevant government ministries and WB - Monitor compliance parameters regarding Safety, Health and Environment (SHE)</td>
<td>Biannually</td>
<td>Substation and project site</td>
<td>NEMC TANESCO</td>
<td>5,000</td>
</tr>
</tbody>
</table>

#### Table 2: Further Socio-economic Mitigation Monitoring Plan

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Phase Cons. / Op.</th>
<th>Mitigation</th>
<th>Monitoring Indicators</th>
<th>Monitorin g Frequency</th>
<th>Follow-up and methodology</th>
<th>Responsible body</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cons</td>
<td>Compensation- money/house, plot/land.</td>
<td>All families have a house and are settled, have plot, have land and are farming</td>
<td>During ROW acquisition in the project area</td>
<td>Hold meetings with affected families to find out their worries, problems, and</td>
<td>TANESCO and Identified consultants NEMC and</td>
</tr>
</tbody>
</table>
## Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Phase Cons. / Op.</th>
<th>Mitigation</th>
<th>Monitoring Indicators.</th>
<th>Monitorin Frequency</th>
<th>Follow-up and methodology</th>
<th>Responsible body</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Financial Loss Loss of business and tenants.</td>
<td>Cons</td>
<td>➢ Compensate business houses, money for business</td>
<td>➢ People resume their businesses/have tenants</td>
<td>During RoW acquisition in the project area</td>
<td>➢ Meetings with the affected and visits to business areas.</td>
<td>Government authorities</td>
</tr>
<tr>
<td>3. Sociological loss-loss of neighbours,</td>
<td>Cons</td>
<td>➢ Resettle people from same area in one area/resettle people where there are some people living there. Hold meetings to create friendly environment among the community members.</td>
<td>➢ People are settled happily together/formed new friends and neighbours</td>
<td>During RoW acquisition in the project area</td>
<td>➢ Meetings to find out problems in coping with new environments</td>
<td>-do-</td>
</tr>
<tr>
<td>4. Loss of social services like schools, health facilities etc.</td>
<td>Cons</td>
<td>➢ Construct social services like school water supply, health centres, dispensaries, shops, roads, markets, public transport, churches, mosques, etc.</td>
<td>➢ Schools, water supply, roads, transport, hospitals, etc. available and in use.</td>
<td>During RoW acquisition in the project area</td>
<td>➢ Visits to these facilities. ➢ Meetings with the affected communities to find out if there are any complaints.</td>
<td>-do-</td>
</tr>
<tr>
<td>5. Psychological loss</td>
<td>Cons</td>
<td>➢ Pay disturbance allowances to all the affected</td>
<td>➢ Each affected person is paid his/her allowances. ➢ The affected are getting over the shock of the situation</td>
<td>During RoW acquisition in the project area</td>
<td>➢ Holding meetings with the affected from time to time to reassure them of their future</td>
<td>-do-</td>
</tr>
<tr>
<td>6. Transmission of HIV/AIDS between constructing workers and community</td>
<td>Cons and Op</td>
<td>➢ Awareness raising and education on HIV/AIDS among the workers and the affected community ➢ Providence of protective gears (condoms)</td>
<td>➢ Number of awareness raising meetings conducted ➢ Number of awareness materials distributed, ➢ Amount of protective gears/condoms distributed.</td>
<td>Monthly during the construction in the project areas</td>
<td>➢ Checking the contract on the HIV/AIDS. To ensure that the contract is being undertaken properly</td>
<td>TANESCO contractor, consultant NEMC</td>
</tr>
<tr>
<td>Impacts</td>
<td>Phase Cons. / Op.</td>
<td>Mitigation</td>
<td>Monitoring Indicators</td>
<td>Monitoring Frequency</td>
<td>Follow-up and methodology</td>
<td>Responsible body</td>
</tr>
<tr>
<td>---------</td>
<td>------------------</td>
<td>------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>--------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>7 Impact of the land use on the Right of Way</td>
<td>Op.</td>
<td>➢ Inform the community of the right uses of the right of way including plants that are not allowed to be grown on the right of way</td>
<td>➢ Activities and use of the right of way</td>
<td>➢</td>
<td>➢ Regular inspection or audit of right of way to ensure the right use of the right of way</td>
<td>TANESCO</td>
</tr>
<tr>
<td>8 Population increase</td>
<td>Cons</td>
<td>➢ Information dissemination to reduce employment expectation of the local workforce outside the project area ➢ When hiring local workforce give priority to the affected communities</td>
<td>➢ Monitor immigration occurring in the project area communities</td>
<td>➢</td>
<td>➢ Follow up data from the Local authorities offices</td>
<td>TANESCO Contractor Local authorities</td>
</tr>
<tr>
<td>9 Loss of security</td>
<td>Cons.</td>
<td>➢ Control the number of new comers who are jobless ➢ Improve security measures</td>
<td>➢ Monitor the number of law breaking incidences (thefts, killing, fights, etc.)</td>
<td>➢</td>
<td>➢ Follow up data from the local authorities offices and police stations</td>
<td>Local authorities, TANESCO, Contractors Police</td>
</tr>
<tr>
<td>10 Interference with graves, cemetery and cultural sites</td>
<td>Cons</td>
<td>➢ Avoid them by altering the route or pylon sitting ➢ Request authorization from relatives, religious leaders and proponents to bear the moving costs</td>
<td>➢ Monitor that no grievances have been lodged ➢ Monitor the process of exhumation and reburial or ensure compensation is paid</td>
<td>➢</td>
<td>➢ Follow up complaints ➢ Public meeting</td>
<td>TANESCO, Local/religious leaders, relatives</td>
</tr>
<tr>
<td>11 Impacts of electromagnetic waves on human health</td>
<td>Op</td>
<td>➢ Adherence to the recommendation by TANESCO relative to the distances for setting up the residential houses ➢ Sensitise the population about the potential health risk of setting up</td>
<td>➢ Ensure that no residences are being set up under the transmission line or within the right of way ➢ Monitor the level of awareness of people in the</td>
<td>➢</td>
<td>➢ Regular inspection of the transmission line corridor ➢ Public meetings</td>
<td>TANESCO NEMC</td>
</tr>
</tbody>
</table>
### Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Phase Cons./Op.</th>
<th>Mitigation</th>
<th>Monitoring Indicators.</th>
<th>Monitoring Frequency</th>
<th>Follow-up and methodology</th>
<th>Responsible body</th>
</tr>
</thead>
<tbody>
<tr>
<td>residences under the high voltage line or RoW</td>
<td>Restrict people to build under the line or within the safety zone</td>
<td>project area about the potential health risks if built a house under the line</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The monitoring costs will be determined by the number of monitors to be involved and the contractor’s (consultants) package

Cons. – Construction Phase  
Op. – Operation Phase
CHAPTER 1

INTRODUCTION

1.0 Background

The demand for electric power in Tanzania has been increasing rapidly due to the growing economic and social situation in the country. However, power outages and deterioration of power quality (under voltage), technical and non-technical losses have also increased in spite of the efforts taken so far by TANESCO management. This is due to the overload experienced in some substations and ageing distribution network. This situation calls upon the urgent major maintenance and upgrading of the current transmission and distribution systems and development of new sources of electricity. The total number of costumers connected by the end of December 2004 is 530,000, mainly residential, industrial and commercial. The average growth of the costumer base since 2000 is between 6 to 9%.

In 2002, TANESCO in collaboration with Japanese International Cooperation Agency (JICA) prepared a Master Plan to improve the power systems in major towns of Dar es Salaam, Kilimanjaro and Arusha. The Master Plan outlined areas of priority and investments needed to solve the frequent power outages experienced in major cities. Further, TANESCO undertook several studies including Relief Project 2 done by NetGroup Solutions (Pty) Ltd of South Africa in 2004 and feasibility study on the Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System done by Lahnmeyer International of Germany completed in December 2004. All these studies identify areas of priority and type of investment needed by TANESCO so as to optimally utilize the available resource to achieve the desired objectives.

Based on the above-mentioned studies, TANESCO has consulted various financiers to seek assistance in implementing different components of the Master Plan. The World Bank (WB) as one of the contacted financiers showed interest in supporting TANESCO in that respect. Hence TANESCO and the International Development Association (IDA)/World Bank are currently preparing a distribution rehabilitation and transmission reinforcement component as part of the Songo Songo Gas Development and Power Generation Project (Credit 3569-TA). The amount under discussion is about US$ 65 million.

1.1 The Project

The project will achieve the following objectives:

- Reducing the duration and frequency of power interruptions
- Improving voltage conditions at consumers premises
- Reducing power system losses - technical and non - technical losses
The proposed project consists of two components:

1. New constructions of 132kV Transmission lines and new 132/33kV substations as follows:
   - 132kV T/L from Ubungo S/S to Mikocheni New 132/33kV substation (new Oyster Bay S/S)
   - 132kV T/L from Ilala S/S to Factory Zone III (via Kurasini S/S, Mbagala S/S and Yombo S/S)
   - 132kV T/L from Moshi (Kiyungi S/S) to Arusha (Njiro S/S) and respective upgrades of both substations with new 132/33kV substation near Kilimanjaro International Airport (KIA)

2. Rehabilitation of 18 existing substations at Oysterbay, Mikocheni, Msasani, Factory Zone I, Factory Zone II, City Centre, Factory Zone III, Sokone, Kurasini and Ilala in Dar es Salaam. Others are Mount Meru, Unga Ltd., Kiltex Ltd, Them and Njiro in Arusha and Boma-Mbuzi, Trade School and Kiyungi in Kilimanjaro region. Further there will be a repair and upgrade of the 11/33 kV distribution systems. Rehabilitation of Distribution Facilities includes:
   - Supply and installation of 22 additional 15 MVA, 33/11kV transformers to relieve the overload in the existing substations
   - Supply and installation of about 33 33/11kV circuit breakers and 124 11kV circuit breakers with associated switchboards
   - Supply and installation of 50MVA 132/33kV transformer with a circuit breaker at Kiyungi Substation
   - Supply of materials and equipment for repair/upgrading of the distribution systems which make a provision for the following: reconductoring, protection systems, auto-reclosers and auto load break switches, scada, section analyzers, boosters, lightning protection, distribution transformers, new 33/11kV lines and statistical metering

Upgrading of substations means replacement of power transformers by a higher rated power transformer. This involves upgrading of the foundations to a higher bearing capacity, which may mean also power outages of several weeks if a temporary measure of using mobile substations is not opted.

**Component 1** requires a comprehensive Environmental and Socio Economic Impact Assessment (ESIA) and Resettlement Action Plan (RAP) while **Component 2** requires a comprehensive Environmental Audit Assessment (EAA). This report deals with component 1 above and presents the Environmental and Socio Economic Impact
Assessment (ESIA) and Resettlement Action Plan (RAP) findings and recommendations.

It is a requirement that all World Bank investments must comply with the World Bank Safeguard Policies. For Environmental and Socio Economic Impact Assessment (ESIA) and Resettlement Action Plan (RAP) will be fully responsive to IDAs “safeguard” operational policies: notably OP 4.01 (Environmental Assessment), OP 4.04 (Natural Habitat) OP 4.11 (Cultural property) and OP 4.12 (Involuntary Resettlement) and Electric Power Transmission and Distribution guidelines, Occupational Health & Safety. Additionally, national requirement as reflected in various Tanzania’s sectoral policies and the National Environment Management Council (NEMC) Environmental Impact Assessment Guidelines (2002 update).

1.2 The objectives of the Environmental and Social Assessment

The objectives of the Environmental and Social Assessment as described on TOR is to carry out a comprehensive Environmental and Social Economic Impact Assessment (ESIA) and prepare a Resettlement Action Plan as per country law and World Bank requirement as well as bringing more benefits to the society.

1.3 Scope of Work

The Environmental and Social Assessment which took place in November 2004 to January 2005 focused on three scenarios of regular steel towers which require 40m wide way leave, compact design towers which require 15m wide way leave and the underground cable which require up to 5m wide way leave. The scope include:

- To establish the viability of the project on environmental and social point of view,
- To document the baseline situation (environmental, socio economic health and safety issues),
- To identify and analyze potential impacts (environmental, socio economic health and safety issues) and where possible and relevant to quantify potential impacts on the biophysical and social environment during all phases of the project cycle.
- To prepare an analysis of alternative (consideration of alternatives) e.g. various root considered for the new transmission line, different design (e.g. underground cables or compact design and including the no project alternative and provide a brief cost and benefit analysis. The selected route should take economic, technical, social and environmental parameters into consideration (proposed and fully justify optimal choices that would minimize or avoid potential impacts)
- To design an environmental and social management plan (ESMP) to address and mitigate impacts that cannot be avoided. The EMSP should describe in
detail the mitigation measures to be carried out, the costing, monitoring process, scheduling and organizational capacity required to implement such measures

- To identify measures for environmental enhancement and sustainability that may be desirable to be put in place.
- To identify any social and environmental management capacity building and institutional strengthening support that may be required within or outside TANESCO for the departments or institutions involved in the project
- To recommend actions to improve and strengthen TANESCO’s environmental, health and safety management

1.4 Methodology and approach

To accomplish the Environmental and Socio Economic Impact Assessment (ESIA) and Resettlement Action Plan (RAP) the following approach was applied:

1.4.1 Review of relevant documents


1.4.2 Site visit

We visited the proposed routes for assessment and adopted different techniques of baseline data collection on the existing environmental conditions, namely

- Use of checklist to determine potential environmental impacts of the proposed route in terms of likelihood of occurrence, magnitudes of the impact and significance of impact.
- Field observations and recording including sample collections, photography along the proposed route and its vicinity.
- Hold discussions and meetings with key informants (local government leaders and experts and TANESCO staff) along the route of the proposed project and its vicinity.

The checklist identifies issue as per the following categories following as deduced from the guidelines

- Effect on existing land use (land value, ecological sensitive cites, existing utilities e.g. telecommunication);
• Visual intrusion on the landscape;
• Increased erosion and interference with local drainage patterns;
• Hazards of electrical shock and strike to birds or other wildlife;
• Increased access and its associated effects (from the transmission line itself or construction and maintenance roads); and
• Potential localized human health problems.

1.4.3 Public Meetings
Apart from reviewing of available documents and route observations we had to do intensive public consultations that included discussions with different heads of different offices at district, institutions department, ward and village offices. Further, public meetings with communities along the identified ROW for the proposed transmission lines were held. These meetings introduced the project to the public (people to be affected by the project) then listened to what they feel about the project and what the project should do to reduce the project impacts to the community (further information on public consultation is available in the separate document under Social Impact Assessment).

1.5 ALTERNATIVES
The construction of 132kV electric power line from Moshi (Kiyungi Substation) to Arusha (Njiro Substation), Ubungo to Mikocheni, and Ilala – Kurasini- Mbagala- Yombo to Factory Zone III will have the following alternatives these are:

- Alternative 0: No Project scenario (i.e. not constructing the line)
- Alternative 1: Project scenario (i.e. constructing the line)
CHAPTER 2

FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Environmental management has become a global challenge and a requisite for every project at local and international levels. Financiers, governments through environmental agencies and the public are demanding environmental responsibility of every action taken by corporate. This is due to the fact that any development activity has the potential to impact negatively or positively to the environment and the society is the one, which benefit or looses. Therefore we are required to develop ourselves in a sustainable manner without compromising the ability of future generations to survive.

One of the useful tools in ensuring the environment is given a due consideration is the Environmental Assessment (EA), which provides an opportunity to assess the project, find out impacts before implementation and plan mitigation measures to reduce the impacts of development.

This chapter reviews legal, policy and guidelines, which must be considered during planning and implementation of the project to satisfy the requirement the Tanzanian Government, the World Bank, Multilateral agreements which Tanzania is a signatory and the donor community as whole.

2.1 Tanzanian requirement

In Tanzania each Ministry is responsible for the environmental aspects of all projects under its jurisdiction. The office of the Vice President (VPO) has an overall role in environmental issues. The National Environment Management Council (NEMC) advises the Government on environmental issues and reviews the environmental aspects of the project. When the project addresses all environmental concerns to the satisfaction of Multi- Sectoral Technical Review Committee (TRC) under NEMC, the NEMC issues the environmental permit (clearance).

In the past each sector had its own legislation dealing with environmental issues (i.e. provisions relating to ESIA are found in the various statutes, administrative rules and regulations of environmental agencies). Legislations governing ESIA in Tanzania is also found in diverse legislation relating to energy, mining, tourism, wildlife and national parks. But since November 2004 the government passed the Act of Parliament, Act No. 20 of 2004, known as Environmental Management Act, 2005 (It is unified environmental legislation to deal with the environmental issues). This Act is expected to become effective from July 2005.
In the mean time, the existing National Environmental Policy (NEP 1997), National Environment Action Plan (NEAP, 1996) and National Conservation Strategy for Sustainable Development (NCSSD, 1995) continue to form a basis for the assessment. All these stipulate that EIA should be mandatory to development projects.

In addition, there is a draft document, "National EIA guidelines and procedures (2002)", which may be used or referred to in EIA undertakings. The study was undertaken in accordance with Tanzania's National Environment Management Council (NEMC) draft EIA guidelines of 2002 and World Bank Guidelines for Environmental Impact Assessment.

2.1.1 Environmental Review
TANESCO through the Ministry of Energy and minerals needs to apply for environmental approval (Environmental Permit) from NEMC. Upon submitting the Environmental Impact and Audit Statement, the NEMC reviews the document and issues a Provisional Environmental Permit (PEP) when the document is accepted and given approval.

2.1.2 The National Environmental Policy (NEP 1997)
The National Environmental Policy provides the framework for making fundamental changes that are needed to bring environmental considerations into the mainstream of decision-making. It provides policy guidelines and guidance to the determination of priority actions, and need to monitor, regular review of policies, plans and programmes for the sake of environment.

The policy insists on protection and control of land, water, vegetation and air degradation, which constitute our life support systems and also requires protection of biological diversity of unique ecosystem.

2.1.3 Sectoral Policies
The following sectoral policies highlight the environmental obligations of any project proponent (developer) so as to support the goals of sustainable development and environmental protection and conservation.

The energy policy of February 2003 insists on the need to consider environment in its totality. Issues such as energy production (construction of electricity facilities, their operation and maintenance), procurement, distribution systems, and utilization should be done in an environmentally sound manner.
2.1.3.2 National Water Policy (2002)
The policy insists on the integrated water resources management involving all stakeholders. It further emphasises that water resources shall be conserved and water pollution should be avoided. The relevancy of this policy to this environmental impact assessment study is to remind the project proponent the need to avoid any kind of oil spills, wastes of harmful substances or any other substances that may cause water pollution of the source or water body of any kind during project implementation, operation and decommission.

2.1.3.3 Other Relevant Policies
There other relevant policies to this study which are worth mentioning. They include the Land Policy (1995), Sustainable Industrial Policy (2000) the National Human Settlement Development Policy of 2000 and Town and Country Planning Ordinance of 1956 and Health Policy particularly on the issues of occupational Health. All these policies emphasize the importance of project proponent to consider all aspects ranging from land where the project is going to sit to the welfare of the workers or other people who may be affected negatively or positively and whether directly or indirectly. Early consideration of all aspects will make the investment to be sustainable.

2.1.4 Environmental Legislation Frameworks
The following Acts also provide a framework for this environmental assessment in Tanzania’s perspective.

2.1.4.1 Water Utilization Act (1974); amended in 1981
The Act establishes a central Water Board with the authority to regulate the use of water, to control water pollution, and formulating standards for effluents and stream quality. The Water Board grants the discharge consents. The 1981 amendments include Standards for Receiving Waters, based on their classification (i.e. Category 1, 2 or 3). The Act provides standards for Temperature, pH, organic substances and inorganic substances, oil and grease, etc. The standard allows the maximum limit of 10 ppm of any discharges of oil and grease to receiving waters. Any discharge of oil and grease in excess of 10 ppm must be treated before being discharged. Therefore, any discharges from the planned or operating facility must abide by this limit.

2.1.4.2 The Land Act, 1999
One of the fundamental principles of this Act is to ensure that land is used productively and that any such use complies with the principles of sustainable development. The Act also stipulates procedures of acquiring land from the rightful owners and the required compensations. Under the Act it is fundamental principle to
pay full, fair and prompt compensation to any person whose right of occupancy or recognized long-standing occupation or customary use of land is revoked or otherwise interfered with to their detriment by State under the Act or is acquired under the Land Acquisition Act; the concept of opportunity shall be based on the following:

- Market value of the real property;
- Transport allowance;
- Loss of profits or accommodation;
- Cost of acquiring or getting the subject land;
- Any other cost, loss or capital expenditure incurred to the development of the subject land; and
- Interest at market rate should be charged.

It is also a fundamental principle to enable citizens and in this particular case the affected in decision making on matters connected with their occupation or use of land. TANESCO has to follow all procedures of acquiring land and compensation must be paid fully and promptly.

Through this Act the proponent should know that after the useful life of the Project is over the land should be left in a state where others could use it. Hence decommissioning of the project should be done when the project activities come to an end.

2.1.4.3 National Environmental Management Council Act (1983)
The Act established the National Environment Management Council (NEMC). The relevance of this Act to this Environmental and Social Impact Assessment is the recognition of NEMC as the legitimate body in advising the government on all matters relating to the environment and formulating policy on environmental management; pollution control; developing EIA guidelines; formulation of proposals for legislation in the area of the environmental issues and recommending to their implementation by the Government. NEMC issues a Provisional Environmental Permit (PEP) when it is satisfied that the project meets the country’s environmental requirements.

2.2 International agreements on environment
Tanzania has also committed herself to a number of international agreements on environment and development. The relevant international agreements to this environmental and social assessment include:

- Convention on Biological Diversity (CBD), adopted in May 1992. The aim of this convention was on developing national strategies for the conservation and sustainable use of biological diversity.
The Climate Change Convention adopted in June 1992 and ratified by Tanzania in March 1996. The major aim of this convention is to combat the global warming by reducing emission of green house gases. It is an international community tool in its effort to promote sustainable development.

Convention concerning Protection of Workers against Occupational Hazards in the Working Environment due to Air pollution, Noise and Vibration, adopted in 1977. The aim of this convention is to ensure the safe working environment for the workers.

 Basel Convention on trans-boundary movements of hazardous wastes and environmentally sound management of hazardous wastes (April 1993)

Stockholm convention on Persistent Organic Pollutants (POPs). The convention calls for all countries to properly manage the pollutants such as Polychlorinated biphenyls (PCBs) and advises restrictions on the marketing, use and disposal of PCBs.

The United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and / or Desertification, particularly Africa adopted in 1994. The convention calls for proper management of vegetations and reduce the spreading of desert.

2.3 The World Bank

The World Bank, through the International Development Agency (IDA) and the IFC has established Safeguard Policies and environmental guidelines of which a lender needs to comply depending on the nature of the project. For this Environmental and Social Assessment the following policies and guidelines may apply.

2.3.1 The Policies

OP 4.01: Environmental Assessment: Requires an Environmental Impact Assessment for all projects to be funded by the World Bank Group to ensure that they are environmentally sound and sustainable.

Applicability of the policy to this project

The project involves new constructions of 132kV transmission lines and new substations. Hence an ESIA is a requisite.

OP/BP 4.04: Natural Habitat: Aims to promote and support natural habitat conservation, protection, maintenance, and improved land use. The policy insist on precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development.
The policy is applicable to this project in the sense that we are to protect the natural vegetation wherever possible during the implementation of this project. In addition, it is required to control oil pollution on land (soil) and water and any behaviour that will affect natural habitat or degrade the land, which can be used for other purposes.

**OP4.12: Involuntary Resettlement (Revised in April 2004):** The World Bank recognizes that involuntary resettlement may cause severe long-term economic, social and environmental damage if appropriate measures are not carefully planned and carried out. Hence the policy objective is to minimize involuntary resettlement as far as possible by exploring all viable options and designs.

- Where it is not feasible to avoid resettlement, then it should be done in a sustainable manner by providing sufficient investment resource to enable the persons displaced by the project to share in project benefits. Also displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.

- Displaced people should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them to pre-displaced levels or to levels prevailing prior to the beginning of project implementation, whichever higher.

Hence the policy requires the following to be done though the list is not exhaustive:

- Resettlement Action Plan (RAP) to be prepared
- Prompt and effective compensation at full replacement cost for losses of assets attributable directly to the project should be provided
- Consultations and information of the right of the displaced persons should be made
- Displaced people are provided with assistance such as moving allowance
- Displaced people are provided with residential housing, housing and or agricultural plots
- Displaced people are offered support after relocation to ensure that their livelihood is restored
- Displaced people are provided with development assistance in addition to compensation measures such as credit facilities, training and job opportunities
- Vulnerable groups such as the elderly, women, widows, children, etc., should be given special considerations
- Ensuring that displacement does not occur unless all necessary measures for resettlement are in place.
Applicability of the policy to this project
It is anticipated that the construction of new 132kV transmission line need extra land, which will involve involuntary resettlement. A resettlement plan is included in the Terms of Reference. Therefore a Resettlement Action Plan will be prepared and submitted separately.

OPN 11.03: Cultural Property: requirement to protect and conserve cultural sites

Applicability:
The project needs to avoid significant damage to the known, cultural sites, sacred places, graves, cemetery, etc. during project design and implementation stages.

OP 4.36: Forestry: requirement to protect and conserve the forestry.

Applicability
Since the project will involve clearance of vegetation within the right of way, the project need to implement mitigative and offsetting measures to minimize the loss of vegetation as recommended by experts or by following the recommended measures from the government forestry department.

Disclosure of Information Policy
Information about the project needs to be disclosed to the public. Hence, information about this project needs to be made available locally, nationally, internationally and at the World Bank InfoShop so as to allow the public to comment or lodge any opposition to the project if is likely to cause severe environmental damage.

2.3.2 Pollution prevention and Abatement Handbook Guidelines
The purpose of the guidelines among other things is to identify environmental, health and safety risks. Then recommend cost-effective measures that would improve the environmental, health and safety status to meet the WB standards. The guidelines that have been considered in the study include the following:

1. Electric Power: Transmission and Distribution
2. Polychlorinated Biphenyls (PCBs)
3. Occupational Health and Safety Guidelines
4. Environmental Monitoring and
5. General Environmental guidelines

These guidelines in a nutshell:
- Require having in place acceptable working environment and it is the obligation of the employer to provide that acceptable working environment, provide all
necessary personal protective gears (PP) to employees, first aid kit, and essential welfare facilities and enforce the use of PP when necessary

- Require that all discharges from the facility to be treated to acceptable limit levels before being release to water bodies

- Require to have equipment, a system or procedures in place to control spillages that may contaminate soil, underground and surface water

- Require to have a plan or a system in place to deal with emergence cases of fire, spillage or accidents in place of work or facility to minimize the number of casualties, damage costs and environmental disaster

- Require to have a knowledgeable workforce to reduce health and safety risks of the workers and safety of equipment as well as improving the working efficiency

- Require a systematic phasing out of PCBs and Chlorofluorocarbon compounds (CFCs) containing equipment and in ensuring appropriate storage and disposal
CHAPTER 3

BASELINE ENVIRONMENTAL CONDITIONS (Moshi - Arusha T/L)

3.1 Project Overview

3.1.1 Route Description: Moshi – Arusha Transmission Line

The line starts at Kiyungi substation located in an unpopulated area close to Tanganyika Plantation Company (TPC) dealing with sugar cane plantation and sugar production. From Kiyungi the line runs parallel in northern side of the existing 132kV line. The line passes Kikafu and Mijongweni Villages (Machame Kusini Ward) in Moshi rural District. Then the line passes Longol, Ngosero, Kawaya, Chekimaji, Rundugai and Sanya Station Villages in Masama Rundugai Ward in Hai District before arriving at proposed Kilimanjaro International Airport (KIA) substation (to be located between tower 90 and 91).

From KIA the transmission line runs parallel to the existing line (see Njoro –Kiyungi map) on the southern side. It passes through Maluia village in King’ori Ward. Then it passes in Samaria and Maroroni villages in Maroroni Ward before reaching private estates. The line crosses through BCW Holdings Limited and Usa Manyata estates before reaching Nambara village in Kikwe Ward.

From Kikwe Ward the line crosses Gomba Estates, LFDA Flowers Estates before arriving in Mlangarini village in Mlangarini Ward. Then the line passes in Olkereyani village in Moshono Ward before arriving at Njoro substation located in Njoro Hamlet in Engutoto Ward. From tower 91 at KIA, Malula village to tower 214 end of Olkereyani Village, the area is in Arumeru District in Arusha Region. From tower 214 to tower 218 (Njoro Substation) the area is in Arusha Municipal Council (see the attached map showing towers 214-218).

In Njoro Hamlet, the proposed line will (if 40m is used) affect mostly residential houses of high quality to moderate houses as you move out to Arumeru district. However between towers no 214 to 215 the housing are poor houses with mud or wood thatched with corrugated iron. Some of the houses in that area still exist in original 30m way leave corridor. In the area there are two local shops and one local brew bar which will also be affected if tower design takes 40m corridor way leave.
Table 3.1: Summary of villages and Ward as described above

<table>
<thead>
<tr>
<th>Municipal District</th>
<th>Ward</th>
<th>Village</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arusha</td>
<td>Njiro</td>
<td>Engutoto</td>
</tr>
<tr>
<td>Arumeru</td>
<td>Moshono</td>
<td>Olkereyani</td>
</tr>
<tr>
<td></td>
<td>Mlangarini</td>
<td>Mlangarini</td>
</tr>
<tr>
<td></td>
<td>Kikwe</td>
<td>Nambala</td>
</tr>
<tr>
<td></td>
<td>Usa</td>
<td>BCW Holdings Limited (Doli) and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Usa Manyata Estates</td>
</tr>
<tr>
<td></td>
<td>Maroroni ward</td>
<td>Maroroni Samaria</td>
</tr>
<tr>
<td></td>
<td>King'ori</td>
<td>Malula</td>
</tr>
<tr>
<td>Hai</td>
<td>Masama Rundugai</td>
<td>Sanya station, Rundugai, Kawaya</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and Longoi</td>
</tr>
<tr>
<td></td>
<td>Machame Kusini</td>
<td>Kawaya, Ngosero, Longoi, Mwijongeni</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and Kikafu Chini</td>
</tr>
<tr>
<td>Moshi Rural</td>
<td></td>
<td>Kiyungi</td>
</tr>
</tbody>
</table>

3.2.1 Physical geography
3.2.1.1 Climate
The climate of project area varies with the geographical conditions and altitude. Temperature is much cooler than in the coastal region and drop further as altitude increases. The mean temperature varies from 11°C minimum to 33.2°C maximum. High altitude enjoys considerably more rainfall than the semi-arid regions, which make up most of the country. At the higher elevations of Mt. Kilimanjaro and Meru slopes, annual precipitation exceeds 1,800 mm and decreases at lower elevations. However, low-lying areas receive less than 500 mm of precipitation each year. This region generally has a heavy rainy season from March to May, and light rainy season in November and December.

3.2.1.2 Surface Water Hydrology
The proposed Transmission line will pass on the lower zone where the major surface water resources are rivers, streams and springs originated from the top of Mount
Kilimanjaro and Meru. From Arusha the line will cross the Nduruma, Kijenge Tengeru, Malala, Mbembe, Makumira, ngaresero, Ndurumanga, Usa, Sanya and Kikafu Rivers. Most of these rivers are small and some are seasonal with a small flow. There are no intensive groundwater uses due to dry climatic conditions of the area.

Water for domestic use is commonly available in the form of public or private tap water, uncovered springs, private shallow wells and rivers. In some cases, spring water from highlands like Mount Meru and Kilimanjaro has been tapped and allowed to flow by gravity system to lowlands. In general, there is limited supply of treated water (indoor piping) and this is only available in the urban areas (i.e. Arusha and Moshi towns). For Hai district there exist water supply project which is financed by KFW.

Whatever the source, the water quality is rather low being acidic or alkaline due to geological formation of the region.

There are some irrigation schemes in project area; at Kikafu chini village, Mijongweni, Kawaya, Longoi, chekimaji, Kikwe, Olkereyani villages and Usa estates (Manyata, Gomba, etc.).

3.2.1.3 Topography, Regional Geology and Site Geological Conditions

3.2.1.3.1 Topography
The project area is dominantly covered by volcanic mountain massifs abruptly from plateau country at about 900m above sea level. For Arusha area, mount Meru raises from about 900m a.s.l to about 4,600m at the summit. Kilimanjaro rises from 900 m.a.s.l to 5,895 m.a.s.l at the highest peak.

The Transmission lines runs almost east - west direction south of the high volcanic mountains in Africa, namely Kilimanjaro and Meru. It runs almost along the Moshi Arusha road. North of this road, the terrain is of mounded topography formed by Meru lahars while in the south of the road and where our transmission proposal is running, outwashes from lahars form a more even plain.

Wide spread topographical features are formed by the spread of lahars or cold mudflow in the south and southwest of mount Kilimanjaro emanating from Kibo peak and mount Meru.

3.2.1.3.2 Regional Geology
Mt. Meru and Kilimanjaro are younger volcanic products of Pleistocene to Recent. Essentially the geology of the area is consisting of a pile of Neogene volcanic products and some interbedded sediments accumulated on eroded surface Precambrian metamorphic rocks.
3.2.1.4 Soil
Different soils characterise the project area. The south side of Mount Meru exhibits some black soils with distinctive carbonate concretions. Elsewhere, soils on volcanic rocks show substantial colour variations from red to brown and even grey. In some areas calcareous duricrust zones are found within the project area (For more detailed information refer to a geological investigation appended as annex 2).

3.2.1.5 Wet Lands
There are swampy areas between tower numbers 32 to 36 at Chekimaji village and near Kiyungi Substation. Parts of swamp areas are used for farming activities.

3.2.1.6 Land use and land covers
The proposed transmission line passes through different types of land covers and use. The most dominant one is agricultural land and human settlement. The main land uses existing in the project area include:

3.2.1.6.1 Residential houses, farms and scattered trees
After leaving Njiro substation the proposed line will be heading straight East parallel to the existing 132kV line. Both sides is covered by a number of high grades residential houses, garden farms under the lines (on way leave) and scattered tree up to the border of Arusha Municipality and Arumeru district at Engutoto village, which is marked by the Kijenge streamlet. There is concentration of rural human settlement at Engutoto village; houses are located very close to the existing transmission line from both sides of the corridor and even some of the houses are located within the right of way. The dominant trees that exist in this area are exotic trees except when you cross the Kijenge streamlet, where there are indigenous riverine trees.

3.2.1.6.2 Farms, scattered residential houses, bushes and trees
After crossing the Kijenge streamlet, the proposed line passes in farms, scattered rural residential houses (located particularly where there are roads or pathway crossing the existing line) and scattered bushes and trees. In this area the natural vegetation is very limited and concentrated in river banks and areas where there is no human settlement. The reason behind this vegetation limitation is due to cultivation and continuation of trees cutting for firewood, charcoal and constructing materials. Construction of existing 132 kV line also cleared some of the trees in 60m corridor way leave to allow the construction of the line.

Close to Kiyungi substation at Kikafu and Mijongweni area, the dominant vegetations include paddy and banana trees. They are located in an irrigated area.
3.2.1.6.3 **Human Settlement Patterns**

The human settlement pattern can be divided in two main areas i.e. the rural and the urban centres in Arusha and Moshi Municipalities. The rural resettlement is concentrated in the neighbourhood of the existing 132kV transmission line route due to accessibility and also the suitability and availability of land for agriculture activities. Take note they use the 60 m transmission corridor for agriculture activities.

In Arusha municipal planned and unplanned settlements exists. The unplanned settlements include Engutoto village in Arusha municipal. The planned areas include the area around Njoro substation and along the existing 132kV line up to the border of Engutoto village.

3.2.1.7 **Land and Soil Degradation**

The major environmental degradation observed on the proposed 132kV transmission line route is the existing of stone quarries used to take materials for road construction, gully erosion caused by cultivation on the hills slopes and livestock path and sheet erosion in farming areas. Taking into consideration that the proposed line is located on area of strong wind which blows from east to west, the rate of sheet erosion is expected to be very high. Therefore soil erosion must be checked regularly and take preventive measures when necessary, otherwise it will threaten the good operation and life of proposed and existing transmission lines.

3.2.1.8 **Access to Wild Lands**

The proposed transmission line is easily accessible by the existing earth road and railway line from Moshi or Arusha from which scattered settlements along the existing line are connected. There is no wild land along the proposed transmission line corridor as most of the areas have been affected by human activities ranging from agriculture, grazing and settlement. The proposal is to use extra 20m in addition to 30m of way leave of existing transmission line.

3.2.1.9 **Traffic Condition**

For accessing the proposed and existing 132kV transmission line three alternative routes could be used. These include:

i. The new Moshi - Arusha highway (Tarmac)
ii. The old Moshi - Arusha highway (Gravel)
iii. The railway line Moshi - Arusha

Traffic conditions were surveyed and observed during the fieldwork. The assessed traffic conditions are as follows: -
The new Moshi – Arusha road: Peak traffic time is morning from 8.00 to 10.00 and afternoon from 16.00 – 19.00 and mostly concentrated in town vicinity (Arusha and Moshi)

The old Moshi – Arusha road: The road has no peak time. Hence the traffic congestion is not an issue in this road. However, although the road is passable it is not in good conditions

The railway line Moshi – Arusha: Very low service frequency (It was reported that only one (1) train shuttles per day)\(^1\). The railway line for most part is located not far and is along the existing line

Apart from their normal traffic conditions, these roads will be used for ferrying equipments and personnel during the construction, operation and maintenance stages of the project. Therefore, this quick survey was done for the purpose of predicting the impact due to additional traffic load arising from project construction and operations. Also to suggest mitigation measures needed to reduce the traffic impact in terms of accident prevention, traffic jams and environmental degradation due to constructions of new access roads.

### 3.2.1.10 Aircraft flight path

Between Arusha and Moshi (Kilimanjaro) there exists an international airport known as Kilimanjaro International Airport (KIA). The proposed line will add new towers and electric conductors which may disrupt flight paths near the airport thus endangering low – flying aeroplanes. The project should take this problem into consideration when planning for this project.

### 3.2.1.11 Corona Effect and Radio Interference

The additional 132kV transmission line parallel to the existing one can increase the corona effect. The corona discharge is a tendency whereby the air immediately adjacent to electrical conductor become ionised. Corona effect is increased as voltage level increases and it is visible and audible under certain conditions mainly during the rain or when air moisture content increases. The effect leads to power losses in transmission lines. Corona can also causes interference of radio reception through unwanted disturbances in the Radio Frequency Band range 3kHz – 30,000MHz.

Corona effect can also cause ionisation of oxygen molecules in air resulting to formation of traces of Ozone and Nitrogen Oxides (breakdown of the nitrogen molecules can lead to the formation of various forms of nitrogen oxides).

---

\(^1\) Verbal Communication with TRC Arusha Station Master
3.2.1.12 Electromagnetic Fields
The effect of electromagnetic fields increases as the transmission voltage increases. Normally the electromagnetic fields occurs primary within or in the immediate vicinity of the Right of Way (RoW). With addition of another 132kV line, parallel with existing 132kV line can increase the effect of electromagnetic fields. A note should be taken that so far there is no scientific proof concerning the effects of electromagnetic fields to human health.

3.2.1.13 Archaeological and Cultural
The survey by an archaeological and cultural expert from Municipal and District councils through consultations, meeting with local leaders and elders and physical fieldwork shows that no archaeological and monumental sites exist in the proposed line except for burial sites and at Engutoto village, where one type of tree (Mkuyu) is used as cultural feasts. The burial sites were also observed on the existing 132 kV transmission line.

3.2.1.14 Natural Hazards
The project area is located within the earthquake prone region. However, no severe earthquake has been reported in recent years in the area. Since this is most destructive natural hazards that can cause loss of human life and destruction of infrastructure it should not be forgotten as a potential natural hazard risk to the project.

3.2.1.15 Litter and Debris
Construction activities including construction camps for workers, foundation works, towers erection and stringing of wires are expected to be the main sources of litter. In construction camps litter comes from food wastes and waste papers for office activities. Other wastes like pieces of wires and cement bags will be produced during the foundation works, towers erection and stringing of conductors.

It is expected that the project will involve the demolishing of houses and structures that has been already compensated to allow for the way leave and construction pylons and stringing of electric conductors. Therefore the quantity of debris is expected to be high.

3.2.2 Biological environment
3.2.2.1 Flora
The survey for flora identification was done by forest experts from Arusha municipal, Arumeru and Hai district councils with the help of environmental experts from TANESCO.
The proposed 132kV transmission line route from Moshi (Kiyungi) to Arusha (Njoro), which passes parallel to the existing 132kV transmission line traverses a mixed vegetation in 100m wide both sides from community based forestry tree planted farms, bush lands and scattered trees, grass, wooden grassland and river channel overgrowth (Riverine vegetation). Bush lands consist of scattered trees and in some areas clustered with single storey trees with very little diversity of species. The most dominating indigenous species are as tabulated in table 3.3 which indicates the dominant are indigenous and exotic species.

### Table 3.3 Dominant vegetation type in project area:

<table>
<thead>
<tr>
<th>Indigenous</th>
<th>Dominant Tree Species/vegetation</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Acacia species</strong> (Migunga in Swahili) with height 1 – 2 metres above ground</td>
<td>Olkereyani, Kikwe and Miangařini Villages</td>
</tr>
<tr>
<td></td>
<td>- <em>Acacia xanthophiea</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <em>Acacia Nubica</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <em>Acacia drepanolobium</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <em>Acacia polyacanth</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cumbretum Species</strong> (Mipea Mwitu in Swahili)</td>
<td>Maroroni and Samaria Villages</td>
</tr>
<tr>
<td></td>
<td>- <em>Cumbretum molle</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <em>Cumbretum stilhumaenii</em></td>
<td></td>
</tr>
</tbody>
</table>

Other species include: *Kigelia aethiopum* (sausage tree), *Rauvovia inebriens* (masesewa) and *Balanites aegyptica crotton* species. There are also different types of pioneer plants, climbers and shrubs such as lantana species.

<table>
<thead>
<tr>
<th>Indigenous</th>
<th>Dominant Tree Species/vegetation</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Ficus (Mikuyu in Swahili)</strong></td>
<td>These species were observed where the line crossing the rivers.</td>
</tr>
<tr>
<td></td>
<td>- <em>Ficus capens</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <em>Ficus sycomorus</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Baobab (Mbuyu)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <em>Adansonia digitata</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Phoenix species</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Timber tree</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <em>Cordia Africana</em> (Mringaringa)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <em>Rauvovia inebriens</em> (masesewa)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Newtonia Buchananianii</strong> (Mkufi in Chaga)</td>
<td></td>
</tr>
</tbody>
</table>

### Exotic Species

The species include: *Grevillea* (Grevillea robusta), *Senna spectabilis* These exotic trees were found planted either on...
In general the vegetation cover is thicker on the area where the transmission line crosses the water sources or rivers. This is due to the fact that in majority of the areas the vegetation cover has already been affected by human occupation, land use, climate and other activities. However, wild fires and agriculture are major reasons. Also the climate of the area, which is dry, has determined to the great extent the existing vegetation cover.

Within the whole-proposed project area, including a transmission line route, there is no endangered species or any one of conservation importance.

### 3.2.2.2 Fauna

According to the interviews\(^2\) held with Natural Resources Officers responsible with natural resources matters in the study area, there is no national park or reserved area where the proposed electric transmission line passes. Further, there is no wildlife on the proposed project area and the transmission line route.

No fishing activities were observed in the proposed transmission line route although there a number of rivers crossing the RoW.

Since mammals of ecological significance are not available in the project area, the field survey focused on avifauna. The following species of birds were recorded roosting on existing 132kV electric wires, near by trees and on the paddy fields at Kikafu village.

- Quelea quelea
- Forest Hornbills
- Flying Pigeon
- Doves
- Wrens
- Weaverbirds

---

\(^2\) The interview was about the status of wildlife (mammals and birds) in the study area followed by a field survey.
According to the data available at Kiyungi and Njiro substations there is no recordable incidence of power outage caused by birds' electrocution on existing 132kV transmission line since it was constructed.

### 3.2.3 Socio – economic and cultural aspects

#### 3.2.3.1 Administrative Definition of the Study Area

**3.2.3.1.1 Regional levels**

The regional level is the high-ranking level of administration and according to the local government, the regional authorities are responsible as coordinators to all the districts in the region.

The area under study includes three regions of Arusha, Dar-es Salaam and Kilimanjaro and in each region the area is located in a specific district.

**3.2.3.1.2 District /Municipal councils**

Administratively the district head quarter is responsible over all development activities and permission to conduct any activity in a particular area in the district has to come from the district/ municipal council directors. The district/ municipal directors are informed of any activity being undertaken in his/her area of administration. It is important to get his/her permit to proceed with the activities as well as get permit to get any needed information and assistance within his area of administration. Such permits include a letter of introduction and the approval for the particular activity to be undertaken in the district to different personnel at ward/village levels.

**3.2.3.1.3 Division levels**

Divisions are the next authority after the district however the division has a responsibility to coordinate wards within the division.

**3.2.3.1.4 Ward levels**

Wards are the levels responsible for implementing and overseeing development activities. The wards authorities have the authority to permit development activities and monitor all activities taking place in the villages making the ward.

The study group reported to the Ward Executive Officer who would give instructions to the Village Executive Officer to invite community members of the designated area
for the public meeting or the WEO himself would invite the members of the designated area to the meeting (this was particularly the case in the urban area).

3.2.3.1.5 Village levels
This level is clearly defined in the rural areas than in the urban areas where from the ward level, the lowest level is Hamlet and in the rural areas of which is made of hamlets/sub- Villages, while in urban areas the minimum level of administration are hamlets/Hamlets. The village levels are the least level of authority in the district. This is where the developments activities are conducted and coordinated.

3.2.3.2 Kilimanjaro Region

3.2.3.2.1 Hai District
The area under study is one side along the existing 132kV transmission line. Much of the area is located in the rural areas. The land use in all these areas is for farming, building houses, and livestock keeping

3.2.3.2.1.1 Masama Rundugai (mixed) Sanya station/Longoi village

Population
The population of Masama Rudugai Ward (mixed or rural and urban settings) is estimated to be 17,176 of which 8,832 are males and 8,344 females with 3,759 households. The data is based on 2002 national census.

Ethnic Groups
The ethnic groups include Masai (majority), Chagga and few Pare.

Housing Infrastructure
The types of houses are mud and wood and grass thatch, mud and wood and iron sheets and few improved houses built of cement blocks and iron sheet roofing.

Education
Majority of the Masai people are uneducated (never attended school). But a few of them have primary education so are the other tribes. There is no school in the village (Milima wa Shabaha), children attend school in the neighbouring village located at a distance of 3 km. The same with dispensary, it is available in the neighbouring village.

3 Note: The population data at village levels is not available in most villages. Only a few village leaders have made an effort to collect their village population. The remaining majority rely on 2002 population census, which was released to the level of wards only and not at the village levels.
Health
Water supply is not a big problem in one part of the village as the water pipe line passes at the village. Personal cleanliness behaviours may be contributing to a poor health of family especially skin diseases caused by lack of bath and personal hygiene.

Land use patterns
Part of land is used for agriculture; another area is used for grazing livestock—cows, goats, sheep and donkeys. The remaining is used for building purposes. The area is generally dry and bigger part is suitable for livestock grazing. The resident of this area are normally farm maize, beans and sunflower seeds. They have only one farming season which starts in March and ends in August when it is harvesting period.

Due to drought people through the Ward’s efforts are planting trees for shade, fruits and supply of fuel wood as a source of energy.

Industry, Commerce and Economic Activities
There are no industries in the village of semi-nomads and there is one or two shops in the village. They have no milling machine thus they rely on one milling machine in the neighbouring village. The main economic activities are farming, grazing and inter village small businesses.

Transport and communication
The road is poor in one entry because one has to cross a river to reach the village which is full of mud though the village can also be reached from Boma Ngombe. However mobile phone communication network for those with mobile phones is possible.

Energy
The village has no electricity. Their source of energy is the fuelwood for cooking and heating the house and kerosene for lighting the house.

3.2.3.2.1.2 Longoi Village

The village has 5 sub-villages with a population of 1,670 people of which 780 are males and 890 are females with 345 households.

Ethnic Groups
The area is occupied by a two tribes that include the Chagga and Pare tribes. They are all farmers.

Housing Infrastructure
There are houses of three kinds; those built of wood/mud and grass thatch, wood/mud and iron sheets roofing and cement blocks with iron sheets roofing. The houses are scattered.

**Education**
Most of the villagers have primary education while only very few of them have secondary education. The village has one primary school, 1 secondary school for the children in the village and outside the village.

**Health**
There is no health facility; they depend on the health facility in the neighbouring village.
Malaria is a common disease.

**Land use patterns**
The residents in this village are farmers and they grow maize, beans, sunflower groundnuts and bananas. Also some keep pigs, goats, milk cows and chicken. They also plant trees for fuelwood, timber, for shade and for fruits. Other land uses is for building houses. Agriculture is done between the months of March to August harvesting time.

**Industry, Commerce and Economic Activities**
There is no industry other than milling machines. Five (5) milling machines are available in the village using Diesel as a power source. There few small shops in the village. The major economic activity is agriculture.

**Transport and communication**
There is a rough rugged road to the village but passable most in the dry season, in the rainy season it is difficult to reach the village by car. There is no commuter transport. People walk long distance to catch a car to town.

**Energy**
Fuelwood is the source of energy for cooking and heating the house and kerosene is used for lighting the house.

**3.2.3.2.1.3 Ngosero village**

**Population**
Not known

**Ethnic Groups**
The ethnic groups in the village are mainly Chagga and Pare tribes. Sambaa and other tribes are very few. The majority are young and few are old and medium aged.

**Housing infrastructure**
There are poor houses made of mud/wood and grass thatch, house made of mud/wood with iron sheets roofing and houses made of cement blocks with iron sheets roofing.

**Education**
Majority of residents have primary education and very few have secondary education. The village has a primary school for residents’ children.

**Health**
Malaria is a big problem in the area. There are also water born diseases such as diarrhoea and typhoid due to lack of clean and safe water supply and there is occasional break-up of cholera. The village has a health facility that serves for the residents.

**Land use patterns**
Residents are mainly farmers and few keep live stocks, crops produced include maize, beans, vegetables, fruits, sunflower seeds, ground nuts and sugarcane. There is also a tree growing for fuelwood, fruits, shade and timber.

**Industry, Commerce and Economic Activities** — no industry other than food milling machines and furniture making. There are few shops for supply of items and goods. The main economic activity is agriculture.

**Transport and communication** — transport is poor and the road is also poor. One has to walk long distance to get transport to other places. Mobile phones are available.

The rest of other villages have same characteristics as the aforementioned villages except the remaining villages are doing crop irrigation thus helping to assure them of food supply even when there is rain shortage. The villages include — **Kikafu chini, Mjongweni, Chekimaji and Rundugai** villages. Their main economic activities therefore include agriculture (farming) and trade of agro based products.

### 3.2.3.3 ARUSHA Region

#### 3.2.3.3.1 Arumeru District
3.2.3.3.1.1 Olkereyani Village and Mlangarini Ward

The villages involved in the assessment include Olkereyani which is located in Mashono Ward and Mlangarini located in Mlangarini Ward. These villages have same characteristics.

**Ethnic groups**
The Waarusha people are the majority tribe in these two villages, there are other few tribes like the Chagga, Meru and Pare but all very few.

**Land use patterns**
The land use patterns include farming of maize, beans, sunflower seeds, and vegetables by irrigation, cattle grazing, building and growing trees for different uses.

**Housing structures**
Houses vary in quality – there are houses built of mud/wood and grass thatch few of them, the mud/wood with iron sheets roofing and houses built of cement blocks and iron sheet roofing. The houses are scattered and very few will be affected.

**Education**
Being located close to Arusha town, the proximity has had effect on people’s lifestyle. A good number of residents have good education and their level of understanding is also good. But a few have had no education at all. Some cannot speak Kiswahili language. Each village has education and health facilities. They also do irrigation of vegetables in the dry months.

**Industry, Commerce and Economic Activities**
There are no industries in the village as they are waiting for electricity connection which will enable them open up small workshops. The main economic activity is agriculture, trade and cattle grazing. Small shops to supply daily needs are also exist in the area. However, since the village is closer to Njoro and Arusha town, some supplies can be obtained from town centre.

**Transport and Communication**
The two villages are reachable all year round through the available roads. Also there are transportation vehicles commonly known as daladala and the mobile phones network is available.

**Energy**
A major source of energy in Olkereyani village is fuelwood for cooking and heating the houses. Kerosene is used for lighting and at times for cooking. Mlangarini village is connected to electricity however only a few have connected their houses with
electricity. Those connected use electricity for lighting their houses and for electric appliances but rely on fuelwood/charcoal and kerosene for cooking.

3.2.3.3.1.2 Kikwe Village/Ward

Population
The population of Kikwe is estimated as 9,826 of which 5,070 are males and 4,756 are females with 2,165 households. The village is in the rural setting.

Housing infrastructure
There are low quality mud/wood and iron sheets roofing and modern houses built of burnt/cement bricks with iron sheets roofing. The houses are scattered.

Ethnic Groups
Ethnic groups include the majority Wameru and a negligible number of other tribes mainly the Chagga and Pare.

Education
Most residents have primary school education and a few have secondary education. There is a village primary school for the children. Kikwe is currently constructing a secondary school.

Health
The main health problem is Malaria disease. The village has a health facility.

Land use patterns
The residents in these villages are farmers and livestock keepers at a low level. So the allocation of land has to consider livestock as well. Land is used for agriculture to farm maize, beans, bananas sunflower and paddy.

Industry, Commerce and Economic Activities
No industry other than furniture making do exist, there is also milling machine in each village. There are also few scattered shops around. The main economic activity is agriculture mainly paddy farming and maize. Also agro based trade does exist.

Transport and communication
Availability of a passable road to these villages throughout the year has made it easy to reach the villages with little effort. The availability of mobile phones has also made communication easy.

Energy
All the villages have not been connected with electricity. Therefore depend on fuelwood/charcoal for cooking and heating. They also use kerosene for lighting the houses.

3.2.3.3.1.3 Malula village

Population
The current village population is not known and the data available is the whole of King'ori Ward. Majority of the residents are farmers and livestock keepers.

Ethnic groups
The area is inhabited mainly by the Wameru, Waarusha, few Chagga, Pare and others. The inhabitants are farmers, and livestock keepers. They are mainly farmers of maize beans and sunflower seeds and occasionally millet and sorghum.

Housing infrastructure
The housing varies- there houses built of mud/wood and grass thatch, mud/wood and iron sheets roofing and cement bricks with iron sheets. The houses are scattered.

Education
Majority have primary education but some few have never attended school. Very few have secondary education level.

Health
The village has a dispensary and major disease include malaria and diarrhoea in the rainy season when water is easily contaminated.

Land use patterns
Land is used for crop farming like maize, beans sunflower seeds millet and sorghum. They also grow trees for shade, fuelwood, and for fruits.

Industry, Commerce and Economic Activities
There are no big industries in the area. The industries available are food milling machines, welding and furniture making. There also several shops including petrol stations. As this village is along the Arusha – Dar es Salaam highway, other businesses and trade can be found. Other people depend on agriculture and inter village trade (Minada) for their survival.
Transport and communication
Being located along the Moshi – Arusha Tanga-Dar-es-salaam road, accessibility to
the area is quite easy and the availability of mobile phones has made communication
easy.

Energy
The village is connected with electricity and all capable financially have connected
their houses with electricity for lighting the houses and electric appliances. The
population depend on fuelwood for cooking and house heating and kerosene for
lighting and cooking at times.
CHAPTER 4

BASELINE ENVIRONMENTAL CONDITIONS (Dar es Salaam Region)

4.1 Route Description

4.1.1 Ubungo – Mikocheni (New Oyster Bay Substation) Transmission Line
The new planned 132kV electric power transmission line from Ubungo S/S to Oysterbay S/S is proposed first to run on the western side of Sam Nujoma Road it crosses a small residential and small business premises in the area between the Morogoro Road and University Road (Ubungo area). After the university Road the line crosses the Sam Nujoma Road and run to the eastern side (densely populated and high grade houses) up to the road going to University College of Land and Architectural Studies, (UCLAS) then crosses again the Sam Nujoma Road perpendicularly and then follows the UCLAS road on northern side up to Savei area bridge where it turn to the right.

At Savei area the T/L crosses densely settlement (high grade houses and shops) up to the Mlalakuwa streamlet from there it follow the Mlalakuwa streamlet north-eastwards passing largely the army area, which consists mainly of small agricultural plots and occasionally scattered trees. Before it reaches Old Bagamoyo Road the transmission line will come very near to Mlalakuwa streamlet. After reaching the Old Bagamoyo road the proposed line turns southeast to run along the eastern side of the Old Bagamoyo road to the proposed site for New Oyster bay Substation next to the TANESCO regional office. High-grade properties including residences are located along the Old Bagamoyo road.

The proposed electric power line will carry a 132kV single system and it will compose a combination of lattice steel towers, compact design (tubular steel poles) and underground cables. There may be option of allowing a multi-circuit line with one 132kV double circuit and two 33kV circuits. The proposed transmission line is 10km long with the following proposed way leave corridor.

Table 4.1

<table>
<thead>
<tr>
<th>Compact Design (Tubular Steel Poles)</th>
<th>Lattice Steel Towers</th>
<th>Underground cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>15m</td>
<td>40m</td>
<td>5m</td>
</tr>
</tbody>
</table>

4 The line (foundation towers) comes closer to streamlets to avoid high-grade houses at Mlalakuwa.
The report prepared by Lahmeyer International presents a specific and more detailed technical description.

The transmission line will pass through the Ubungo, Sinza, Survey Mlalakuwa and Msasani wards as described below:

The line starts at Ubungo Substation on southern side of the Morogoro Rd in TANESCO property. After crossing the Morogoro Road, it passes in Abiani Hamlet Ubungo ward. Then it goes to Sinza C followed by Sinza A both in Sinza Ward along the Samu Nujoma Road. From Sinza A the line passes Mlalakua Savei followed by Mlakua Mikochni Hamlets both in Kawe Ward. Kawe ward ends at Mlakua Bridge. From Mlakua Bridge the line passes in Bonde la Mpungu Hamlet in Msasani Ward before arriving at New Oyster Bay substation at Mikochni TANESCO offices.

4.1.2 Ilaia — Kurasini — Mbagala — Yombo — Kipawa Factory Zone III

Starting from Ilaia substation located close to TBL the line passes Mchikichini Hamlet up to Uhuru road in Mchikichini Ward. After crossing the Uhuru road the line enters Gerezani Ward. In this ward only institutional properties are located these include Uhuru Primary School belonging to Ilaia Municipal Council, warehouse (godowns) belonging to Tanzania Railway Authority.

From Gerezani Ward the line passes Kilwa Road Bridge to Kurasini Mivinjeni Hamlet followed by Kurasini Minazini Hamlet both in Kurasini Ward before reaching the Kurasini Substation.

From Kurasini Substation the line crosses the ocean creek to Vijibweni Hamlet, followed by Kibene and Mkwavuini Hamlet ali located in Vijibweni Ward (Kigamwoni Vijibweni). From Mkwajuni Hamlet the line touches Tuangoma Ward before reaching Mbagala Kuu Ward. In Tuangoma only empty fields will be touched. In Mbagala Kuu Ward the line is located in Mbagala Kibonde Maji and Mbagala Zakhem. From Mbagala Kuu Ward the line passes Mbagala Kibonde Maji, Rangi tatu and Zakhem Hamlets before arriving at Mbagala Substation.

From Mbagala Substation located in Mbagala Charambwe Ward, the line passes Kurasini Mji Mpya and Nzasa A Hamlets, which are located along southern side of TAZAMA Pipeline. Both hamlets are in Mbagala Charambwe Ward. Then the line passes through Yombo Buza Hamlet followed by Yombo Vituka Hamlet before arriving at proposed Yombo Substation site. Yombo Substation is located in Yombo Vituka Hamlet in Yombo Vituka Ward.
From Yombo substation the line passes again in Yombo Vituka Hamlet. The line crosses the area belonging to JWTZ (Tanzania People’s Defence Forces) before reaching the Tanzania Zambia Railway Authority (TAZARA). Then the line passes parallel to TAZARA railway. Close to cemetery area, the line crosses the TAZARA railway to cemetery area into Kigilagila Hamlet in Kiwalani Ward. From Kiwalani Ward the line crosses the Dar es Salaam International Airport on eastern tip of the runway before entering the Kipawa\(^5\) Hamlet in Kipawa Ward. In Kipawa Hamlet the proposed line runs parallel with Jet Club road and Nyerere Road before crossing the road to Kipawa Factory Zone III substation.

**Table 4.2:** Iilala Substation – Factory Zone III route distances

<table>
<thead>
<tr>
<th>S/N</th>
<th>Iilala – FZ III Route Portions</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Iilala - Kurasini</td>
<td>6.5 km</td>
</tr>
<tr>
<td>2.</td>
<td>Kurasini - Mbagala</td>
<td>14 km</td>
</tr>
<tr>
<td>3.</td>
<td>Mbagala - Yombo</td>
<td>6.9 km</td>
</tr>
<tr>
<td>4.</td>
<td>Yombo – Factory Zone III</td>
<td>6 km</td>
</tr>
</tbody>
</table>

### 4.2 Physical Geography

#### 4.2.1 Climate

The project area lies in the coast region, therefore the climate is of the coast area with low altitude and Temperature is much warmer than in the high altitude areas. The mean temperature varies from 16\(^\circ\)C (June – July at night) minimum to 36\(^\circ\)C (October – March during day time) maximum. This region generally has a heavy rainy season from March to May, and light rainy season in November and December

#### 4.2.2 Surface Water Hydrology

Major rivers within the project area are Kizinga, Mzinga, Msimbazi, Ubungo, Sinza and Mlalakuwa all draining towards Indian Ocean in the northern eastern direction.

---

\(^5\) **Note**

Kipawa and Kigilagila Hamlet residents are earmarked for relocation. Their area has been given to Tanzania Airport Authority (TAA) for airport expansion. However, they have not been paid of their compensation. Since the area is now belonging to TAA, the Social Impact Assessment team did not meet with people in the area in spite of having appointment with them. It was advised that all the matters concerning these areas should be between TANESCO and TAA
Water for domestic use is commonly available in the form of public or private tape water and individuals underground wells. Dar es Salaam is a city, therefore the underground pipes are major supplier of water to consumers and they are in the form of mixture of plastic and galvanised iron types.

No formal irrigation schemes exist in the project area, except in wetland areas between survey / Malakuwa area and new Bagamoyo road (army area). The major land use pattern is human resettlement.

4.2.3 Topography, Regional Geology and Site Geological Conditions

4.2.3.1 Topography
In general, Dar es Salaam is in coastal region which lies on low land between 0 and 120m above sea level. The highest part of region is Pugu hills which rises to about 300m a.s.l. The proposed transmission line corridor is transversing in a terrain with altitude ranging between 15 and 60m above sea level.

Dar es Salaam harbour is on a Northern part of River Mzinga mouth along the Indian Ocean coastline.

4.2.3.2 Regional geology and Soils
The main geological formations of Dar es Salaam region, in brief summary, are composed of:
- Pugu Kaolinitic sandstones, which are fine to medium grained and off-white in colour. These are found in the south west of Dar es Salaam with SW-NE trend line.
- Clay bound sands is another geological formation overlaying the sandstones. The sandstones are reported to be of, probably, Mio-Pliocene age and they are semi-consolidated.
- Reef limestone, occurs at several localities in the region. The age of this formation is assumed to be Mio-Pliocene.
- Superficial sands of the flat, low lying coastal plain represented by redistributed outwash material from the fault blocks. East of Pugu, the sands are clean and off-white but elsewhere they are buff to brown.
- River alluvium consisting of sands varying from off-white to buff-brown. The fine grades tend to be dark due to presence of admixed organic matter.

According to geological investigation, two types of faults dominate the region. The most dominant set is the one whose trend line varies between NE to N. This seems to control the major rivers in the region. Second set is the one apparently controlling the coastline in the region trending in the SE-NW direction. These faults are considered to be of recent age geologically. More detailed geological investigation is attached as annex 2.
4.2.4 Wet lands
The swampy area exists between Survey / Mlalakuwa and Old Bagamoyo road area. Parts of swamp areas are used for farming activities mostly paddy cultivation.

4.2.5 Land use and land covers
The proposed transmission line is transversing through human settlement. The main existing land use in the project area is urban human settlement, planned and unplanned settlements.

4.2.6 Land and Soil degradation
The major environmental degradation observed on the proposed 132kV transmission line route is the vegetation clearance for housing constructions.

4.2.7 Access to wild lands
There is no wild land along the proposed transmission line corridor as most of the areas have been affected by human activities mainly human settlement development.

4.2.8 Traffic Condition
The proposed line will be accessible by:
   i. Nelson Mandela highway (Tarmac)
   ii. Sam Nujoma Road (Tarmac)
   iii. Old and New Bagamoyo (Tarmac)
   iv. Existing access road to the army area (gravel)

Generally there is traffic congestion almost through out a day for all first three accessible roads. There is reduction of traffic congestion only for few hours between 12.00 and 15.00 hours.

Apart from its normal traffic conditions the roads will be used for ferrying equipments and personnel during the construction, operation and maintenance stages. The survey was done for the purposes of predicting the impact due to expected additional traffic load arising from project construction and operations. Hence, suggesting mitigation measures to reduce the traffic impact in terms of avoiding accident, traffic jams and environmental degradation due to constructions of new access roads.
4.2.9 Aircraft flight path
The proposed line which consisting of towers and electric conductors can disrupt flight paths in and near airports. However, for Ubungo – Mikocheni T/L no airport does exist nearby while for Ilala-Kurasini-Mbagala-Yombo-Factory Zone III, there is Dar Es Salaam International Airport adjacent to the proposed line.

4.2.10 Corona effect and Radio Interference
The construction of proposed 132kV transmission line can increase the corona effect. The corona discharge is a tendency whereby the air immediately adjacent to an electrical conductor become ionised. The corona effect is increased as voltage level increases and it is visible and audible under certain conditions mainly wetness (e.g. rain). Corona effect causes power loss in transmission lines and may also reduce radio reception due to interference with Radio frequency Bank (3 kHz – 30,000MHz).

Corona effect can cause ionisation of oxygen molecules in air resulting to formation of traces of Ozone and Nitrogen Oxides (note: breakdown of the nitrogen molecules can lead to the formation of various forms of nitrogen oxides).

4.2.11 Electromagnetic fields
The effect of electromagnetic fields increases as the transmission voltage increase. Normally, the electromagnetic fields primarily occur within or in the immediate vicinity of the Right of Way (RoW). However, so far there is no scientific proof concerning the effect of electromagnetic fields to human health.

4.2.12 Archaeological and Cultural
The consultative meetings with local leaders, residents, elders and physical survey during the field work shows that no archaeological sites and monuments sites exist in the proposed right of way except burial sites. Burial sites were observed along old Bagamoyo road near the area called Wariyoba.

4.2.13 Natural hazards
The project area is located within the low sensitive earthquake region.

4.2.14 Litter and Debris
Construction activities including demolishing of compensated houses, camps for workers, foundations and towers erection and stringing of wires are expected to be the main sources of litter and debris. In construction camps, the sources of litter production are food wastes and waste papers from office activities. Other wastes like pieces of wires and cement bags will be produced during the foundation work, towers erection and conductors stringing.
It is expected that the project will involve the demolishing of compensated buildings and structures to allow for the way leave and construction pylons and stringing of electric conductors. Therefore the quantity of debris is expected to be high.

4.3 Biological environment

4.3.1 Flora

The proposed transmission line route is transverses human settlement where the environmental destruction has already occurred due to human activities. The dominant existing vegetation types are exotic species. Refers to land use map for Dar es Salaam.

Table 4.3 Project area: Dominant vegetation types – Exotic species

<table>
<thead>
<tr>
<th>Exotic Species</th>
<th>Dominant Tree Species/vegetation</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grevillea (Grevillea robusta)</td>
<td>These exotic tree were found planted around homestead and they are mainly for fruits, ornamental, wind barrier and sun breaker</td>
</tr>
<tr>
<td></td>
<td>Senna spectabilis (Mijohoro)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Markhamia platycalyx</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coconut (cocos nucifera)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pawpaw (carica papaya)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Syzygium cumin (Mizambarau)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mangoes (mangifera indica)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Citrus (lemon and orange)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Senna siamea</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delomix regia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cedrella species</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cordia Africana</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guava (Psidum guavaja)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Musa species (Migomba)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stems (Miwa)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Avocado (Parachichi)</td>
<td></td>
</tr>
</tbody>
</table>

In general, vegetation cover has been normally affected by the extent of human occupation, land use and other activities. The major one is clearing of land area for construction of human settlement.

Within the whole-proposed project area, including a transmission line route, there is no endangered species or any one of conservation importance.
4.3.2 Fauna

Proposed electric transmission line (ROW) passes in urban areas and no national park, reserved area or project area. Hence, there is no wildlife on the proposed project area and transmission line route.

Fishing activities are only done in the Indian Ocean.

The field survey also focused on avifauna. The only common bird species recorded roosting around is Black crow. Other type of birds that may exist within the project area include:6

- Hooded vulture (*Necrosyrtes monachus*)
- Palm - nut vulture (*Gypohierax angolensis*)
- African Fish - eagle (*Haliaeetus vocifer*)
- Bateleur (*Terathopius ecaudatus*)
- Brown snake - eagle (*Circaetus cinereus*)
- Black - chested Snake - eagle (*Circaetus pectoralis*)
- Southern Banded Snake - eagle (*Circaetus fasciolatus*)
- Osprey (*Pandion haliaetus*)
- Martial Eagle (*Polemaetus bellicosus*)
- Crowned Hawk - eagle (*Stephanoaetus coronatus*)
- Tawny Eagle (*Aquila rapax*)
- Steppe Eagle (*Aquila nipalensis*)

According to the data available at Ubungo control centre there is no any incidence of power outage caused by birds electrocution on existing 132kV transmission lines system in Dar es Salaam since it was constructed.

4.4 SOCIO-ECONOMIC BASELINE CONDITION: KINONDONI (Municipality)

Wards studied include the following wards:-

4.4.1 Ubungo Ward

The Ubungo Ward has a Population of about 44, 339 people out of which 22,014 are males and 22,325 are females with 10,070 households. The area under study is called Abiani Harmlet. Majority of the residents are retired old people with few middle aged and young age. The area is located close to Ubungo traffic lights and Ubungo terminal bus. It is a busy area with commercial activities such as supply.

---

6 Birds of Prey of Africa and its Island book written by Alan and Meg Kemp
shops, hardware shops, stores, and other petty activities. Other activities include livestock keeping i.e. piggery and chicken keeping, drinking bars, and restaurants.

**Ethnic groups**
The residents of the Ubungo area are a mixture of tribes.

**Housing infrastructure**
The houses are mostly old and poorly built of cement blocks with iron sheets roofing very few houses are new roofed with tiles. The area is unplanned.

**Education**
Some of the residents are well educated but majority have general education. The area has no education facility - no schools around the area, but children living in the area attend school in the neighbouring areas at Mlimani Primary School or along Morogoro road close to upcountry bus terminal.

**Health**
The area has a dispensary and a number of pharmacies for dug supply.

**Industry, Commerce and Economic Activities**
There are no industries due to size of the area. However, there are carpentry workshops, bars, restaurants, shops and office services stationeries shops. Therefore, the main economic activities of the area include petty shops trading, food vending, pig and chicken keeping, office services, etc.

**Energy**
The area depends on electricity as their source of power for lighting and for other electric appliances. At times electricity is used for cooking, but mostly people depend on charcoal as a source of energy for cooking.

**4.4.2 Sinza Ward**

Areas studied in Sinza Ward were Sinza A and C Hamlets. The two hamlets are located along Sam Nujoma road which joins Ali Hassan Mwinyi road on one end and Morogoro road on the other end of the road making it easy to access the centre of town and other services. This makes the area easily accessed by the famous city transport services - Daladala transport.

**Population**
Sinza ward has a population of 36,469 people of which 17,031 are males and 19,438 are females (source 2002 census). Sinza A has 776 households while Sinza C Hamlet has 1063 households.

**Ethnic groups**
Sinza like any other wards in Dar-es Salaam has a mixture of tribes, it is difficult to tell the dominant group or groups. It is inhabited by different tribes from different parts of Tanzania. As is the cultural practices of Tanzania there is no specific tribe for a specific area. All people live to gather without considering ones place of origin.

**Housing infrastructure**
Housing structures in Sinza area are modern permanent houses built of cement bricks with iron/tiles roofing and are self contained with water supply and flush toilets. This is in a planned high density area.

**Education facilities**
The area under study has no school but within the ward there several primary schools both international and normal schools. There are also a number of secondary schools and many more are being built. There are a number of vocational training centres. The area is also close to the University of Dar-es-Salaam and University of Land and Survey (UCLAS), and Mlimani Primary School where majority of children from this area go for primary school education. All these facilities are located at a walking distance for residents in this area of study.

**Health facilities**
There is a government health centre located at the centre of the Ward. There are several privately owned health facilities where people go for treatment.

**Land use**
As is the case for all urban areas, land use is for building houses. The area is for residential purposes and therefore the land was utilised to build houses for people to live in. However, some houses have been converted to be for businesses like guest houses, bars and small restaurants. Others are shops for different articles, furniture making, small kiosks for fast foods and for other items. There is no land for agriculture. There planted trees for shade and flowers for beauty if the space was available on the plot.

**Industry, Commerce and Economic Activities**
Since the area is specifically for residential purposes there are no industries but small factories like garages, furniture making, cement bricks making and the like. Also small shop and bars do exist in the area. Hence the main economic activity is trade of factory based items and food staff.
Energy
The Sinza residents depend on electricity for power in their houses. However, due to increased electricity supply tariffs, the residents use alternative energy for cooking like charcoal and kerosene.

4.4.3 Kawe Ward

Population
Population of Kawe Ward is estimated to be 94,535 of which 48,058 are males and 46,477 are females. There are 21,487 households.

4.4.3.1 Mlalakua Savei Area

The Mlalakua Savei is located along the road to the University of DSM and UCLAS and can easily access Sam Nujoma road to Mwenge or Morogoro road. Transport and communication is easily available.

Ethnic groups
Like any other part in urban Tanzania, Mlalakua Savei residents are from all over Tanzania there is no single dominant tribe. The residents are either formally employed or self employed in small/petty businesses. However the majority of those in this area are retired, elderly and widowed people.

Housing Conditions
The area studied has permanent modern self-contained houses made of cement bricks and roofed with iron sheets/tiles. The houses are for residential purposes and others serve for social services like shops, Halls for social functions, seminars, workshops and meetings.

Education
The area under the study does not have a school but other areas in the ward have a primary school. The area is very close to the university of DSM and UCLAS and Mlimani Primary school where most of children in this area attend.

Health Situation
As is the case in many parts of the region, there are scattered private health facilities that serve the residents.

Industry, Commerce and Economic Activities
There are small industries like garages, shops, bars, fast food kiosks, guest houses and other services. Hence the economic activities are based on trading of items and service providing.

**Energy**
The source of power used in this area is Electricity for lighting and at times for cooking. However charcoal and kerosene are normally used for cooking due to too high electricity tariffs.

**4.4.4 Msasani Ward - Bonde la Mpunga Hamlet**

**Population**
The population of Msasani Ward is 43,457 out of which 21,792 are males and 21,665 are females with 10,134 households.

**Ethnic Groups**
The residents in this area are mixture of different tribes. No single tribe that is dominant. The residents are formal and informal employees, businessmen/women, petty business people and senior officials in the government. The residents are generally the rich click. The age is a mixture of young, medium and old age residents.

**Housing Infrastructure**
All houses are of high quality cement blocks with very modern features mostly tile floors and tiled roofs. The houses are generally huge in a planned extra low density area meant for the rich community.

**Education**
Located along the old Bagamoyo road, there are so many schools along the area both secondary schools and primary schools mainly private owned. The children in this area can easily access school just by walking. Majority of the residents are well educated. There are very few people who did not acquire proper education.

**Industry, Commerce and Economic Activities**
The area was planned for residential purposes hence there are no industries. However there are commercial activities like shops, bars, clubs, hotels food kiosks, petrol stations and super markets.

**Transport and communication**
Transport and communication is simple and it is easy to access any part in Dar-es-Salaam city using the famous public transport - Daladala.
Energy
The source of energy in this area is electricity for lighting and use of other electricity equipments and possibly gas for cooking.

4.5 SOCIAL BASELINE CONDITION: ILALA (Municipality)

4.5.1 Kiwalani Ward (Urban)
The area studied is along the road towards Yombo Vituka. The population is estimated to be 61,960 of which 31,732 are males and 30,228 are females and 15,763 households.

Housing Infrastructure
Housing structure varies considerably. There are good houses, old poor houses and few modern houses but all the houses are built from cement blocks and iron sheet roofing.

Ethnic Groups
There is a mixture of tribes and no specific dominant tribe.

Education
The majority of the population has primary level of education, a few have secondary and college or university education. Along the proposed transmission line there are no school which will be affected. Children go to the near by schools including Kiwalani Primary School

Health
Malaria is the main disease coupled with some water born related diseases like diarrhoea, and typhoid. There private dispensaries and pharmacy where people get medical attention.

Industry, Commerce and Economic Activities
Small scale industries like carpentry, welding and tailoring are present in the area. Commercial activities include shops, food kiosks, restaurants, guest houses, and food stalls which make the base of economic activities in the area.

Transport and communication
The transport by daladala and availability of mobile phones and TTCL landline has made communication and accessibility to the place easy.

Energy
The residents depend on electricity for power and for lighting their houses, they also depend on charcoal and kerosene for cooking.

4.5.2 Mchikichini Ward

Population
Population of Mchikichini Ward is about 19,463 of which 9,844 are males and 9,619 are females with 4,419 households only. The residents depend on petty business for their livelihood. The residents are of mixed age groups, old, medium, and young. The area included in the study is high density and unplanned area.

Ethnic group
There is a mixture of many tribes with no specific dominant tribe. People live mixed without consideration of tribe or place of origin. In the project area, majority are not educated and those few who went to school ended up at primary school level only and very few have secondary school education.

Housing infrastructure
The houses are built of cement blocks roofed with iron sheets but the houses are generally of poor quality. The houses are congested and unplanned.

Education
There is a close by primary school known as Mchikichini Primary School and secondary school too. Because of poor education background most residents have poor incomes that cannot enable them to send their children to private secondary schools.

Health
Although they are close to private health facilities majority prefer to go to Muhimbili National Hospital for treatment. The residents are susceptible to Malaria, cholera and diarrhoea diseases due to the environment surrounding them.

Industry, Commerce and Economic Activities
In the area there is Tanzania Breweries Ltd that borders the area under study. The neighbourhood is facing this industry while the rest are small businesses like shops, fast food kiosks and carpentry works.

Energy
The residents depend on electricity as a source of lighting the houses though some houses do not have electricity. Hence they use charcoal and kerosene for cooking food and for lighting as well.
4.6 SOCIAL BASELINE CONDITION: TEMEKE (Municipality)

Studied wards included:

4.6.1 Yombo Vituka Ward (Urban)

Yombo Vituka and Buza area
The population stands at 59,975 out of which 30,337 are males and 29,638 are females with 14,112 households. The area is planned as medium to high density area. Few people are of old age, majority are in the middle age group and few are young age group.

Housing infrastructure
Houses vary in quality, there are houses of high quality with tiles roofing. Others (most) are good houses with iron sheet roofing all built with cement blocks. The housing structures indicate a mixed income groups; poor, medium and rich people.

Education
The residents' education varies – some are very well educated to degree/diploma levels, others have medium education –secondary education and others have primary education. The ward has a number of primary and secondary schools, and vocational training centres.

Health
The general health situation is mainly affected by malaria which is the main disease in Tanzania. Others include diarrhoea and typhoid due to use of raw contaminated water. The ward has a health centre and several private dispensaries.

Industry, Commerce and Economic Activities
The area is for residential purposes thus the only industries found are furniture making factories, garages and small workshops. Shops and food stalls are also found in the area. The economic activities therefore are based on petty trade and service providing.

Transport and communication
Transport and communication is made easy by the city town buses famous as daladala. The availability of mobile phones and TTCL landline phones makes communication easy.

Energy
Source of energy for lighting is electricity while charcoal and kerosene are for cooking and for houses with no electricity connection kerosene is used also for lighting.

4.6.2 Kurasini Ward

The area studied includes Mivinjeni and Minazini Hamlets.

Population
The population of Kurasini Ward is 34,501 of which 17,129 are males and 17,372 are females with 8,331 households.

Housing Infrastructure
Majority of Mivinjeni area houses are expensive houses constructed by Tanzania Harbours Authority for its employees where as Minazini houses the quality vary from one individual to the other. However the resident in both areas are mostly retired or old people and only a few young and medium age who are still employed.

Education
Majority of residents have good education to college levels and minority have secondary and primary education. The area is equipped with education facilities such as primary and secondary schools and colleges around (i.e. School of Journalism, Police College and International Relations College).

Health
The diseases in the area include malaria which is the main disease and water related diseases like diarrhoea and typhoid.

Industry, Commerce and Economic Activities
This area is planned for residential purposes. The commonly found industries in residential areas are the furniture making industries and garages. There are also shops, petrol station and education institutions which make the base of economic activity in the area.

Transport and Communication
Transport and communication have been made easy by the availability of city transport - the famous daladala, and mobile phones combined with TTCL landline phones which have made communication very easy.

Energy
The residents depend on electricity power supply for lighting and occasionally for cooking for high income earners. Other sources of energy are charcoal and kerosene or LPG gas for cooking.

4.6.3 Mbagala Kuu Ward

The Mbagala Kuu Ward population stands at 69,825 of which 35,051 are males and 34,772 are females with 16,340 households. The population is mixed in terms of age but majority are medium and young ages. Retired and old age groups are very few.

Housing Infrastructure
The area has mixed types of houses; poorly constructed houses and modern huge houses but all are built with cement bricks and iron sheet roofing and a few with tile roofing. Area under study is the area running along one side of TAZAMA Pipeline Right of Way in the south side. The area has medium and high density residential areas.

Ethnic Groups
All urban areas are preoccupied by a mixture of tribes. There is no dominant tribe in the urban areas.

Education
At least all residents have primary education. There are few with college (diploma, degree) levels while others have secondary and primary education. There are secondary as well as primary schools for children in the area. There are also some vocational training centres for residents as well as outsiders.

Industry, Commerce and Economic Activities
There is furniture making industries, garages, welding and steel making industries. Other activities are mainly activities like shops, food kiosks, drinking kiosks, bars, restaurants, guest houses, food, fruits and vegetable stalls.

Transport and communication
With the famous daladala transport in the city and availability of mobile phone and TTCL landline phones make communication and transport easy. Accessibility to and out of the area is also easy.

Energy
Like any other area in Dar-es Salaam the area depends on electricity for source of power and for lighting while majority rely on charcoal and kerosene for cooking.

4.6.4 Vijibweni Ward (rural)

The area studied runs parallel to the existing 33kV transmission line going to Kigamboni close to Nunge Leprosy centre and later runs along the TAZAMA Pipeline towards south up to Toangoma and Mzinga channel. The ward has a population of about 5,197 of which 2,650 are males and 2,547 are females and 1,287 households. The population is mixed and the area is low density with scattered houses.

Housing infrastructure
Being in a rural setting, the houses vary from mud, wood and grass thatch, to medium and modern tiles roofing.

Education
Majority of the population have primary education, some few have college education and some secondary education. There is a primary school for the population residing in the area.

Health
Malaria is the most prominent disease. Others include water related disease like diarrhoea, typhoid and others. There is a dispensary that caters for the population.

Land use patterns
The people of the area do small scale farming of sweet potatoes, cassava, different vegetables and fruits.

Industry, Commerce and Economic Activities
The area is just starting to develop so there are few businesses, few shops and no industry yet. There are all signs and potentials for industrial growth in future. Some agriculture of fruit trees (mainly Mangoes), coconut trees is also practiced.

Energy
The population depend on electricity for power and lighting. For those not connected to electricity, they depend on charcoal and or fuelwood for cooking and kerosene for lighting the house.
CHAPTER 5

CONSULTATIVE MEETING: STAKEHOLDERS CONCERNS AND OPINIONS

These stakeholders concerns were raised during the consultative meetings held in different wards during the months of January and February 2005. The regions include those of Dar es Salaam, Arusha and Kilimanjaro. The concerns raised are outlined below:

5.1 ARUSHA – MOSHI TRANSMISSION LINE

5.1.1 DOLI Estate and Usa Estate in Arumeru District
The proposed line will pass in the land belonging to Doli and Usa Estates (BCW Holdings Ltd and Manyatta Estate). The study team met with one of estate owners Mr. Tony Christianakis (Owner of (Doli) BCW Holdings Ltd and Manyatta Coffee Estate (formerly Usa Estate). He had the opinion that as long as there will be compensation for the land that the line is going to be used for the transmission line, he has no objection with the project.

5.1.2 King’ori Ward Concerns
The village to be affected by the project in King’ori Ward is Malula Village. The meeting was held on the 3rd February 2005. After a short introduction about the project was given to the community members who attended the meeting, members were told that the aim of the meeting was to make the project known to them and as well as to hear their concerns and suggestions regarding the project. The residents had the following views and doubts:

- There are still some people living within the right of way (reserve) area of the existing transmission line “Is it safe for such people?”
- I have a house and trees in my area that will be affected will I be compensated of my house, trees and land?
- If someone is planning to start building on his/her land is it allowed to proceed with his/her plans or he/she stops his/her plans? The answer was that: Proceed with your plans as we are not here to stop any development activity. Stop order will come after the valuers have valued your properties.
- Is it necessary to pass on that very place? Can’t you divert the line?
- On what basis are the compensations done? The answer was: on the basis of the Land Act of 1999 which states clearly what/how should be compensation
procedure be if someone is to be shifted from his/her place of residence. Also the World Bank guidelines will be applicable

- I want compensation to my trees, crops, house and land
- If I have ploughed my land but have not planted crops will I be paid the costs of ploughing my land together with land?

5.1.3 Maroroni Ward Concerns

The villages to be affected by the project in Maroroni Ward include Maroroni and Samaria Villages. The meetings were held on the 3rd February 2005. After a short introduction about the project, members were told that the aim of the meeting was to make the project known to them and as well as to hear their concerns, suggestions and wishes. Unfortunately only those having houses along the area to be affected were invited. Those with land were not invited. The consultant requested the village leaders and the community members that attended the meeting to be ambassadors and deliver the right message to those not invited but were supposed to be there. The residents had the following views and doubts:

5.1.3.1 Maroroni Village Concerns

- I am one of those who will be severely affected by the project. Yesterday I didn’t sleep after getting the information about the project because I have just finished investing so much on my land; recently I finished my house and have just moved in. I have trees that through painful efforts have grown very nice. I have also an animal barn. This means starting afresh again and much more efforts are needed. I am really bitter about this information.
- How if the house is partly inside the area in question, what will happen to my house? Will I be compensated my house or part of it? And if part of it, how do you expect me to survive?
- In case of compensation we would like to be paid money for all our property and we will decide on our own where to go to buy land and settle.
- We women and children will be the most affected in this process, If TANESCO pays money to men it is very likely for men to disappear with the money and the family will be left without a place to go to. We therefore request TANESCO if possible to provide us with land /plot or we look for land and TANESCO pays for the land and hand over the paid land to us rather than give hard cash which will end up misused and the family becomes desperate and miserable.

5.1.3.2 Samaria Village Concerns

- I have a house trees I want compensation for my house trees and farm.
- I have a house, trees and water well. Will I be compensated all of my mentioned properties?
- I have a house, trees and sisal plants will I be compensated?
• How if unknowingly I bought land that is in the reserve area for the existing transmission line will I be compensated?
• Since our village has never benefited from the electricity despite letting our land for transmission lines, how can villagers benefit from this project? Can’t the project help our village get power? We want to feel the benefits of having the transmission lines pass through our village.

5.1.3.3 Maroroni Ward Recommendations
• Tanesco should be considerate when compensating the properties especially if part of the house (like toilet) which is important for that house is taken away and there is no another space to shift then the whole house should be compensated
• Tanesco in collaboration with local leaders should work together to ensure that compensation benefits the whole family rather than men who may run away with cash leaving their family to suffer. Such compensation should be plot to plot and house to house.
• Tanesco should consider supplying electricity to the affected village such as Samaria so that they see the value of development in terms of electricity supply

5.1.4 Mlangarini and Moshono Wards (Rural)
The meetings in these two wards took place on 4th February 2005. The concerned village include Olkereyani Village in Moshono Ward with total population of 2,800 with 650 households according to 2004 village census and Mlangarini Village in Mlangarini Ward. These villages have similar characteristics. Following a short introduction about the project and aim of the meeting, community members who attended the meeting had the following views, concerns and recommendations:

5.1.4.1 Olkereyani Village
• First speaker requested to know the procedure for compensation.
• Why can’t you look for an alternative technology that will need less land rather than stick to outdated technology which uses 40m which affects people’s life enormously.
• For how long will TANESCO keep on shifting people and disrupting people’s lives/ don’t you think it is high time to change the way of you practice and provide services?
• We would like to know if there is any health effects from the transmission lines rays emissions to the people living close to the lines. Please let us know so that we take necessary precautions to avoid the effects.
We request that the project should consider giving our youth casual labour (employment) as one of the benefits of having the transmission line pass by our village.

For compensation rather than being given plots, we would prefer to be given cash so that we purchase places of our own preferences.

Some of us think it is not appropriate to give people hard cash because experience shows that when people are given cash they end up misusing money and leaving their families to suffer; in this respect we think it is better to compensate people by giving them plots and money for construction of houses and if possible government leaders should make sure the money is not divert to other purposes.

5.1.4.2 Mlangarini Village (rural)

- For the existing transmission line, the affected people were not compensated. Will they be compensated now? The answer was: We are only concerned about the new proposed transmission line to be constructed. The past project of the existing line is over and the land was acquired in different Land Act and Policies back in 1983.
- All my land is gone into TANESCO transmission lines what is the aftermath of me and my family?
- Given the life today, it is very easy to misuse money if given cash, so we ask TANESCO to purchase for us a new land to transfer us to rather than giving us money for land so that when we are given house compensation it becomes easy to construct new houses.
- I was in the existing transmission line but was not compensated and could not move out. I am still living there and cannot move out because the family is very poor and my father is old and seriously sick in bed. This family needs assistance to be able to move out of this dangerous area.

5.1.5 Kikwe Ward

The meeting was held on the 4th February 2005. After a short introduction about the project, and the aim of the meeting to the affected community was given, affected people had the following views and doubts:
- How if my house is 5 metres after the reserve area will I be affected by the project? The answer was: No.
- I think it is better if TANESCO takes all my piece of land and buy me another land far away from the transmission line because it seems that this transmission and shifting are on going processes as long as the demand of power grows.
• The transmission lines are passing through our village and so far there have been no benefits of the transmission line passing through our village. What will the project help so us to feel the benefits of the transmission lines passing through our village?
• I am building a house and has reached the level of linter should I stop the construction or what should I do while waiting for the shifting? The answer was: Proceed with any of your development activities in your premises because we did not come to stop any activity to those who will be affected by the project.
• I have a house, chicken ban, cows ban and a toilet will I be compensated and be helped to shift to another place? The answer was: Yes according to the Land Act of 1999.
• I have open plain land will I be compensated? The answer was: Yes.
• We also ask the project to give us casual employment during construction.

5.1.6 Hai Mjini Ward: Mlima Shabaha Hamlet (Rural)
This hamlet was part of Masama Rundugai Ward, but since 2000, it became a hamlet in Hai Mjini Ward. Very few people will be affected in terms of shifting and even compensation of land. The team conducted a dialogue with individuals by visiting him or her at their homesteads. The raised issues include:

• I want to get support from the project to enable me and my family survive, as is the case before the project.
• I should be compensated my two houses a plot for construction, a place/plot where I can shift my graveyard.
• I need compensation for my houses and money to purchase another land/plot for building a house.

5.1.7 Masama- Rundugai Ward
The villages to be affected in this Ward include Chekimaji, Rundugai, Kawaya, Ngosero, and Longoi. Consultations meetings were held on 2nd February 2005. The community member had the following concerns and views about the project:

5.1.7.1 Chekimaji and Rundugai Villages
• People are bitter over past experiences whereby after valuation of their properties it took so many years before payment of compensation was done
• Are we going to be compensated for our properties? And are we going to be allowed to do farming on the Right of Way area of the transmission lines? The
answer was: Yes but TANESCO reserves all rights of using that land without notice.

- Does valuation of land and property follow actual values or estimated depending on one place to another?
- What is the value of one banana tree? The answer was: the prices can be found in the Ministry of agriculture.
- We request to be paid immediately after valuation has been done to avoid devaluation of shilling.
- We need electricity the project should help us get electricity.
- I am located about 20m from the reserve area; I would like to know the defects I get being close to the transmission line.

5.1.7.2 Kawaya Village
In Kawaya Village only two people will be affected. The two owns open land no house will be affected. The affected people attended a Ngosero meeting.

5.1.8 Machame Kusini Ward

5.1.8.1 Longoi Village
This is the village with 5 sub-villages having a population of about 1670 people, out of which 780 are males and 890 are females and has 345 households. In this village only two people will be affected whose houses will be affected. The rest will be affected on their land that is open field without permanent crops. The land is used for different crops production including paddy and vegetable irrigation. The affected attended the Ngosero village meeting.

5.1.8.2 Ngosero Village
In Ngosero Village around 16 people will be affected and only two out them will have their houses affected, the rest will be land. Concerns raised by the community members were as follows:

- How if my whole land is affected by the project where will I go to do my agriculture? The answer was: You will be compensated of all your land but agriculture of short-term crops is not forbidden on the transmission lines reserve area.
- How if I have permanent crops like banana trees, trees for timber, shade and fruits on my land will I be compensated?
- We request to be given casual employment during the transmission line implementation when it reaches our village.
- We suggest that instead of paying us hard cash TANESCO build us houses for those whose houses will be demolished and hand us ready houses to save us from the construction troubles and possibility of misusing money.
- Compensate me a house, a plot and my trees.
Our Village have very poor roads; can’t the project help us improve our roads as a contribution to our village development?
- Will areas under village government that will be affected be compensated? If yes what will be the modalities of compensating?

5.1.8.3  Kikafu Chini and Mijongweni Villages
These villages are located close to Kiyungi substation. The affected people had the following comments and concerns about the project:
- The new transmission line will affect trees, bananas, houses and land. Are they going to be compensated? The answer was yes.
- I will be affected in terms of house, my crops, permanent plants and livestock keeping I want to be compensated. I am a widow and I have children. I own a farm, a house and permanent plants. What will be my family destiny? The answer was: You will be compensated.
- Can the project help women to reduce poverty by providing them with loans to help them develop small income earning projects?
- Will I be given another plot after compensating my land and plants? The answer was: No; the compensation is to enable you purchase another piece of land.
- Can the project help the villages where the transmission is passing by providing them with clean safe water and health facilities where they are not available?

5.1.9 Njio Ward Engutoto Village
A consultative meeting in Njio ward was held on 24th November 2004. The aim of the meeting was to introduce the project to Njio residents whose properties and residential houses fall under the proposed way leave for the new transmission line and then to listen to their views and concerns about the project. The following are the concerns raised:
- Why don’t you consider utilizing the 30m-way leave already in your possession?
- Consider constructing a new substation away from urban centres like Njio area and bring to the town only 33kV feeders which take small corridor way leave
- Wanted to know what TANESCO does to control the noise caused by the corona effect in 220 and 132kV lines
- Wanted to know if the construction of new transmission line in their area will not affect them health wise due to electromagnetic effects
• Wanted to know compensation modality and how is it going to be implemented. Also wanted to know what is going to be compensated
• Some wanted to be given other plots on top of the compensation of their lost land and houses
• Wanted to know the project time frame to prepare themselves
• Wanted to be assured that electromagnetic fields do not affect people living close to the 220/132/33kV Njiro substation and the 132kV transmission line
• Wanted to know why TANESCO does not compensate people (customers) when their properties get damaged as a result of over voltage or over current
• Project should provide knowledge to the local youngsters and provide temporary and permanent employment to them
• Project should consider using local materials whenever possible
• Whenever possible TANESCO should use the underground cable at Njiro (and other urban areas) to reduce the social impacts that will result if conventional overhead lattice steel towers are used

5.2 Dar es Salaam: Ubungo- Mikocheni T/L

5.2.1 Sinza Ward
5.2.1.1 Sinza A Hamlet

After the consultative team had introduced the project to the community members and invited them to point out their concerns and worries the first reaction was anger by the information and the first reaction was to refuse the idea to be moved out of their area. The concerns and suggestions are as follows:

• Basically we do not want to be moved out of this place. Other alternatives should be considered.

• Because the university area is still open, then instead of moving out the population in Sinza A area, TANESCO should find ways of reaching an agreement with the University of Dar es Salaam so as to avoid extra costs and to avoid disturbing people who have been settled for a very long time in that area.

• One speaker pointed out that she is neither interested nor intends to move out of that place. Why not use improved technology such as underground cable so as to reduce people disturbances as well as reduce possible health and safety hazards?

• Physical loss People are concerned over the loss of their residential houses

• Loss of business houses and income.
- Sociological loss - after staying for a very long time in this place we have developed friends, relations and attachments with neighbours - if we move out of this place it means we will loose all these long established relationships.

- There is so much attachment to the place we have lived in for over twenty years period such that it has so much psychological attachment that cannot be replaced by any amount of money paid.

- We are closer to town; we have all infrastructural structures that are not available in the new place where we will be moved. How can you assure us the availability of such services?

- The area we live in already has all social services and we are close to all social services like schools, from primary to secondary, colleges, good roads, reliable transport, health facilities and many other services that are not available in the new place we will be moved to.

- Moving some of us out of his place would mean pushing us to quick death. Most of us living in this area are retired people; we are so much used to the place therefore not interested to move in whatever amount of money you are going to compensate us.

- We started living here when it was bushy and we were young and energetic now when we are settled, retired and powerless you come to move us to a new place. Can’t you see that I can no longer tolerate the hassles of construction and moving to a new place? In fact if I am forced out, I will commit suicide. It is better I die than facing the idea of moving out.

- Why did the government fail to project the population growth and provide space needed for future growth? Therefore, the governments carelessness should not become the people’s nuisance

- Think that high voltage electricity has health hazards. Have TANESCO people assessed the impact of having a high voltage line passing close to people’s residences?

- Shifting of people will involve not only physical and financial costs but social and psychological losses - neighbourhood, relations, safety that cannot be compensated by any amount of money.

- The land and house prices of the Sinza A area are going up every day due to its location and it will continue to rise following the investment on University area. How come you now want to move us out of here?
Sinza A: Suggestions

- In case a person looses a residence and or business house, he/she should be compensated a substantial amount of money enough to enable the construction of a new house equivalent or better than the one to be demolished.
- The people to be moved must be allocated another plot to help reduce disturbance of search for a plot and be moved from the place of domicile to the new place.
- We should be given a grace period to enable us to construct a house before the demolition of where we are now living.
- If we move from our place of domicile we would prefer to live with the kind of neighbours that we have where we are now living.
- We as community are recipients of government decisions so we only request to be given optional place for next domicile. We should be given a chance to select a place of our own preference rather than be allocated a place we won't be comfortable with. Any allocation of new place should be within Kinondoni Municipality.
- Wherever we are moved to we should be assured of availability of public transport for easing our movement.
- For those who will be affected we have small businesses like keeping milk cows, hair salons, chicken keeping, and shops we should be compensated for the lost income and lost opportunity.
- The value of our houses and plots will be hot cake because of the investment on the University side. The project should take that into consideration.

5.2.1.2 Sinza C Hamlet

The implementation of this project will involve loss of residences, neighbourhood built over a long period of time, closeness to social services like schools, main roads, shops and health facilities and proximity to city centre. However given the fact that the project is for development and is inevitable, we request the following:

- Before we are moved out of our premises we should be given sufficient time to prepare ourselves to move out- ample time to built new houses before demolishing our houses.
- The project should make sure that they have provided all social amenities like school, road, transport services, health facilities, power/electricity water supply, shops, etc.
- Before people are shifted to the new area they would like very much to have same neighbourhood as they are living now.
- They pointed out if they are shifted they would prefer to be allocated in the same district and not otherwise.
We would prefer to be given a chance to select a place to move to on our own rather than being allocated a place with no preference.
- We request the project to compensate other properties other than house and plot like petty businesses i.e. shops, hair salons, milk cows etc.
- Shifting involves a lot of losses physical, financial, social and psychological. All these cannot be compensated by money but we would appreciate to be paid disturbance allowance.

5.2.2 Kawe Ward

5.2.2.1 Mlalakuwa Savei Hamlet

This meeting was held on the 16th January 2005 under the chairmanship of the Hamlet chairman. After a short introduction about the project and the aim of the consultative meeting the residents to be affected by the project had the following concerns and suggestions:
- One of the members wanted to know if the meeting was to request them or to inform them of the action to take place. The answer was that it was a request and information about the project.
- Most of us here are old, retired, widows and widowers who cannot withstand the hassles of new constructions after shifting. Some of us have lived here since 1968. Please find another alternative instead of moving us out of here.
- The day you transfer me from here that day will be the announcement of my death. From here at my age where do I go to? I'm waiting for the day of my death here.
- We want a copy of the project proposal to see the suggested alternatives in writing so as to file it for our references.
- In case it is necessary to move us out it is important to know that the compensation should include not only physical and financial but also psychological, sociological and social amenities which are not easily found in new places.
- We would like to be involved in every stage of the project.
- We will present our wishes in writing after receiving a copy of the project proposal.
- Don't you have alternative technology other than lattice steel structure towers that needs 40m RoW? The space is too much. Try to use the technology that will affect as less people as possible.
- Use the straight line along Sam Nujoma road or look for another alternative route to avoid disturbing many people.
- TANESCO should look not into physical and financial costs alone but look into social and psychological costs as well
- Even the needed space of five metres for underground cable will disturb a number of people. Why not use the road reserve.
5.2.2.2 Mikocheni Hamlet

Only three people will be affected on the proposed line. One has a small house and the other two own two big buildings. The house owners were not available during the time of this study.

5.2.3 Ubungo Ward

The area to be affected in Ubungo ward is the area in Abiani Hamlet located North West at the corner where Morogoro road joins Sam Nujoma road at the Ubungo traffic lights. In the public meeting held, many people in the area attended even those not affected by the project. People had the following concerns and suggestions:

- Why not use the underground cable to reduce social impact and reduce the compensation costs? If not possible then the issue of compensation should be done properly and directly to the affected person and not through the government.
- Our main concern is that when one gives land the owners end up desperate because the compensation is not enough. What we want is a proper compensation.
- We would like to be educated on our rights so that we can have proper control over our own property.
- We want the area covering the 40 metres to be clearly identified to know the exact people to be affected.
- We have our loved relatives’ graves; we request the area to be respected in case the area falls within the area needed for the project.
- Before we are shifted we should be provided with plots to be sure where we will move to
- I want no plot but money because I am tired of this shifting. I want to go back home because it seems now what remains is shifting from one place to another and I’m too old and only waiting to die.
- I’m a tenant and landlords will be compensated. Therefore it will be very difficult for tenants to get a house to rent for a short time of a month or two; therefore tenants should be considered too because they will also be affected by the project.
- Compensation should be done in foreign currency since the government is paid in foreign currency by the donor.
- For those living close to the transmission lines, how are we assured of our safety from the electricity emissions if any?
We would like TANESCO to use private valuers and make sure there is no valuation done by estimation outside site, but should be done through visiting individual properties.

We request that for every step of the project we should be informed and involved as it started.

Each house should be evaluated according to the ongoing prices of to date.

We request that the compensation to be done in a meeting like this and not in government office.

5.2.4 Msasani Ward: Bonde la Mpunga Hamlet

This area is recommended for an underground cable. The study team had to hold two meetings on different dates in an effort to get hold of real owners of the houses in the area. Most of the house owners were not present they were represented by either house caretakers or children. After the introduction of the project to the community members the speaker invited the members to give their concerns, worries and suggestions. Following are the concerns raised:

- Majority do not want to give out any land for electricity cable passage. However majority do not have any objection if the road reserve is used.
- Why not use the road reserve areas and leave us alone or we give 2.5 metres and road reserve give 2.5 metres. Otherwise I am not willing to move out.
- Road reserve measurements are so varied in the area why?
- The issue of unreliable power is very crucial I agree that we give out space for passage of electricity cable.
- One wanted to know if it is possible to use the land with underground cable for parking after cables have been placed.
- We would like to know what will be the health effects of the underground cable if there are any. Assure us if there will be no health effects to us and our children.
- We suggest that during valuation of property together with TANESCO's appointed valuers should be accompanied by independent valuer selected by the affected person.
- Since majority of the residents claim that the road reserve is varied it is important for TANESCO to liaise with the Municipal council to clear the doubts.
- In case of compensation we want updated valuation.

The second meeting was kind of chaotic. People were angry and not ready to listen to any negotiation at the beginning and even some threatened to go to court in cases their property is touched.
5.3 Dar es Salaam: Ilala – Factory Zone III T/L

5.3.1 Mchikichini Ward
The following are the concerns and suggestions raised during the consultative meeting held between TANESCO team and Mchikichini Ward residents who will be affected by the project implementation:

- We want to be compensated for our properties
- Allocate us a place to move and construct new houses
- We would like to be compensated with already constructed houses to avoid the pain of constructing again. Given the fact that the majority here are poor if given money might end up misusing money and family gets disrupted so it is better if we are given ready house than hard cash for house construction.
- I would like to be given a plot at Mbweni in Kinondoni district.
- We are used to living close to all social services i.e. we don’t need transport to get to reach Kariakoo market, big shops, Muhimbili Hospital, Fish market/ferry or schools for our children they just walk. That means moving us out of here will mean a complete loss of our life style. Hence the compensation should consider all such things and the disturbances that will be involved.
- Compensation of the house should not consider the type of house rather the person should be compensated enough to enabled the construction of a comfortable home and also consider costs involved in constructing a house of the same size today
- Should we stop rehabilitating our houses if one is planning to do so? The answer was: No one has been stopped to do her or his development activities in his premises. Stop order will come later after valuers have assessed everybody’s property.

5.3.2 Kurasini Ward

5.3.2.1 Kurasini Mvinjeni Hamlet
Kurasini Ward has two hamlets which will be affected if the project is implemented. During the consultative meeting with affected people in Kurasini Mvinjeni Hamlet the following concerns and suggestions were raised:

- If you consider compact and underground cable technologies as expensive, have you considered the cost of shifting people in terms of compensation if you take 40m way leave?
- We want compensation for our houses, new plots, and be paid disturbance allowances.
- Some of us don’t want to be shifted if there is an option it should be adapted. The issue of psychological and social defects is not compensable.
- I suggest the compensation of houses should be divided into two categories: the ordinary ~50 million and the best 100 million including other properties.
- Have you prepared a place to shift us to?
- The area to be allocated for those to be shifted should be properly demarcated so as to avoid unnecessary land disputes.
- In case of complaints who should we get in contact with?
- What will happen if I don't want to shift?
- We would like to know the decision on the three options of technologies you have on the table.
- We request the project to use underground cable so as to shift as few as possible.
- I'm worried about the valuers that they could be unqualified and end up undervaluing our properties.
- Are independent valuers allowed so as to compare the values given by TANESCO and that of independent valuer?
- Try to look for a place to divert the line where people to be affected will be fewer.

5.3.2.2 Kurasini Minazini Hamlet
The meeting was held on 21st of January 2005 starting at 4.55 pm. The following are the concerns and suggestions raised during the meeting:
- The first speaker started by thanking the TANESCO for involving the affected people from the very beginning of the project. What TANESCO need to know is that we will be very much affected by the project because we have tuned ourselves to live here our life time. We have school children here and we have our businesses here. This project will cause us great harm psychologically and particularly our children.
- We would like TANESCO to compensate us satisfactorily to the point that we will be able to live comfortably as we currently live here.
- The compensation should be enough to enable some one to construct a good quality house as the one living in.
- The compensation should be paid straight to the affected person and not through the government so as to avoid embarrassment and deduction of our money.
- I have lived here too long and I am too old for shifting. If comes the worst and I have to shift, make sure the compensation covers all the disturbances including psychological defects. But I am worried that this shifting will kill me.
- I'm very much disturbed by this information, and have been unable to sleep. If there is anyway to avoid shifting us, please try the alternative way.
- If the project knows widows and widowers they will think otherwise. I suggest they use the open space between the Military area and the Mwalimu Nyerere SABASABA exhibition grounds. It will reduce costs for TANESCO as well as reduce people's disturbances and worries.
5.3.3 Vijibweni Ward

Vijibweni meeting was held on 20th January 2005. Residents of Vijibweni, Kibene and Mkwajuni Hamlets attended the meeting. The following are the concerns and suggestion raised during the meeting:

- Affected people should be compensated even the empty plots.
- If my piece of land is affected is it possible to be compensated crops and be given another plot?
- Will we be compensated a plot and all the crops?
- We want qualified valuers to do proper valuation of our properties and should be informed of amount to be paid before payment so that we won’t be paid less of what we should be paid.
- We request that all agreements regarding properties and property payments should be done in writing.
- We are living in a place where we have all the social services like water supply, schools, health facilities and transport services. So wherever we will be moved to, TANESCO should make sure the social amenities are available.
- Is one allowed to buy his/her own plot instead of being allocated by TANESCO?

5.3.4 Mbagala Kuu Ward

Mbagala Kuu residents had the following concerns and suggestions during the consultative meeting with the likely affected people:

- One wanted to know who will pay people who constructed on the ROW of the TAZAMA pipeline.
- I am too old now if I get transferred where will I go to at this age?
- Since the project will touch people’s lives, we suggest that proper evaluation of houses be done and we also need a one year period of preparation.
- The government should provide compensation of plots.
- I would like to be allocated a plot right here in this very neighbourhood.
- We would like to be involved in every process of the project.
- We want all that which will be affected by the project to have representation in the project committee.
- Far from effect of loosing residences our children will be affected, we request that our youths be involved by providing them with casual labour during construction.
- We’ve lived here for over 15 years. We have neighbours and schools so we would not like to move far away from here. So we request that we be allocated plots within this ward –An area called Mgeni Nani has enough land where TANESCO can get us plots.
- People with houses made of mud and wood and grass thatch should be compensated well so as to improve their lives.
5.3.5 Mbagala Charambe (Nzasa & Kurasini Mji Mpya)

- The project should consider underground cable to reduce compensation costs as well as social impact to the people
- Majority have no objection to the project but people should be compensated
- They want transparent valuation procedure, fair and prompt compensation
- They want the project to involve them in every step of the implementation
- They want to be compensated first and given time to rebuild before demolishing their houses
- Some need to be given new plots and some want cash so that they find a suitable place for themselves
- They wanted WB compensation procedures to be followed in this project
- Employment to their youth during the project implementation
- They requested that the actual affected people to be known early so that they start looking for the alternative place to go.
- They requested TANESCO to contact TAZAMA PIPELINES to see if they can share the RoW to reduce the impact to the people and properties

They requested the project to consider underground cable if possible or in waste case use only 15m only

5.3.5 Mbagala Charambe (Rangi Tatu Street)

- The project should consider underground cable to reduce compensation costs as well as social impact to the people
- Majority have no objection to the project but people should be compensated
- They want transparent valuation procedure, fair and prompt compensation
- They wanted the project to consider even those who have properties without title deeds
- They want to be compensated first and given time to rebuild before demolishing their houses
- Some need to be given new plots and some want cash so that they find a suitable place for themselves
- They requested the project to facilitate the availability of new places for their businesses and for housing

5.3.6 Yombo Ward: Yombo Buza Hamlet

The meeting was conducted on 22nd January 2005 starting from 1.45 pm. The following are the concerns and suggestions raised during the meeting:

- One speaker suggested the use of underground cable to reduce disturbance of people.
The other speaker suggested the use of the open space of the TPDF and the TAZAMA pipeline ROW to reduce the number of people to be shifted as well as costs involved in shifting people.

The issue of relocation is not only compensation payments but involve lot more that cannot be compensated. There has been too much of this shifting practice. TANESCO should use the technology that needs less land.

From today when will we be moved out? – The answer was that until the valuers have done their job and the work is accepted by TANESCO and the donor, after payment of compensation has been done and time to prepare the new homes has been expired.

We want to be provided with plots and compensation of property.

Buildings and undeveloped plots will be affected. Will the undeveloped plots be compensated as well? I hope no one is going to take away my land without compensation.

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.

I want to be paid for my plot and compensation of my house and I will decide where I want to shift to.

Who will pay the compensation- the government or TANESCO? The answer was: The government will be involved to make sure rights are being done to everyone.

How if the graves are affected will they be removed or what is the fate of the graveyards?

Our experience shows that compensation is not done on time. We therefore request that as soon as the valuation is done payments of compensation should be done on time.

When valuation is ready people should be informed on their amount they will be paid so that it is not easy for those handling the payments to cheat on people.

5.3.7 Yombo Vituka Ward

After introducing the project to Yombo Vituka residents and requested for their concerns, feelings and suggestions regarding the project implementation, the community members general response was that: since this was the government's decision and it is for development purposes they can't stop it. However they had the following concerns and suggestions:

- Before we are moved out of our place of residence there should be proper preparations by TANESCO.
- Make sure there is a place prepared where people will be moved to.
- Prepare and make available plots for those who will be affected, sufficient compensation that will enable them construct a house of the same standard like the one we live in.
- Make sure that the small businesses like kiosks are also compensated since it is an income earning activity.
- Make sure that the social amenities- schools, health facilities, roads, water supply, public transport, market and power are available to where will be moved to.
- There should be a provision of choices for the place to be moved to- individuals have their own preferences and they should be allowed to pick on their own a place they would like to move to.
- One wanted to know if his/her property is half way affected, will she/he be compensated only the affected area or the whole area? - I would like to be compensated the whole area.
- How is the assurance that those who are close by the ROW won't be affected by the ultra radiations from the transmission line?
- How will be the evaluation of an empty plot going to be? What will be the compensation?

5.3.8 Kiwalani Ward
During the consultative meeting Kiwalani Ward residents had the following concerns and suggestions regarding the project and project implementation:
- Look into the prices of plots, construction costs, and the compensation has to enable us build a house and not a hut.
- It is not fair shifting from one place to another. The experience I have with TANESCO is that they pay well but the payment for compensation is delayed, thus we want payments to be done once (no instalment payments) with promptness. Once the evaluation has been done payments should not be delayed.
- When TANESCO is certain about the shifting dates we should be given sufficient time to prepare ourselves to move out so as to avoid family disappointments.
- We would prefer to direct communication between TANESCO and us and not with the government.
- Compensation payments and relocation plots should be given soonest after evaluation so as to start preparation for shifting.
- We were stopped to do any development projects on our plots and we are very tired over such situation, so we want to be certain if we will be shifted.
- TANESCO will have to give us alternative plots for constructing a house, money for building, and then give us time for construction and preparation to shift. There should also be payment of disturbance allowance.
- We also request to be informed of all stages of the project and progress. We request that everything that touches our lives we should be informed.
- People want to know if they could proceed with their planned development activities on their plots. The answer was yes because the visit of the consultants
was to introduce the project and collect people's ideas, concerns and suggestions and not to stop any activity on the expected area.
- TANESCO should connect our houses in the new areas with electricity because where we live now we have electricity.

5.4 Concerns from other stakeholders
The following are concerns and opinion from other stakeholders which include various government leaders, institutions and NGOs:
- Employment should be offered to the village residents first in all villages through which the proposed transmission line passes.
- Socio benefit from project should be considered to the nearby villages where the proposed line passes i.e. access to electrical power by the project.
- Fear of health risks associated with electromagnetic fields and corona effects for those living close to transmission line should be addressed.
- The compensation to be fair and promptly. The past mistakes which occurred on compensation during the construction of the existing 132kV line, should not happen again.
- Use of land under the transmission line for the agriculture activities should be allowed (i.e. restrictions on land use should be eased)
- Use of new technology like compact design and underground cables, which takes minimum way leave corridor, should be considered in the planning exercise of this project. That will reduce resettlement costs and social impacts and socio economic conflict with people.
CHAPTER 6
ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS AND MITIGATION MEASURES

Analysis of the Impacts

The impact analysis uses the following terms:
Likelihood – terms to be used include unlikely, likely or certain which will refer to the level of possibility that the impact will occur. Unlikely will mean that the possibility 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 will mean that the impact will surely occur irrespective of the preventive measures adopted.

Duration – this will refer to the life of the impact. The terms to be used include short-term (0-5 years), medium-term (5-10 years), long term more than 10 years and permanent which will refer to the impacts that will continue life long even if the mitigation measures are implemented.

Intensity – this parameter indicates the magnitude of the impact or violation of a certain standard.

Spatial – the terms to be used include local which means the impact will be on the same vicinity of the project area, regional when the impact will impact larger area within the same country or region, International when the impact has the international significance.

Degree of significance – this will incorporate the above mentioned parameters (likelihood, duration and intensity) to determine how severe the impact will be. The categories of these parameters will be low, medium or high significance.

6.1 General
A proposed 132kV transmission lines project from Moshi (Kiyungi S/S) to Arusha (Njiru S/S), from Ubungo to Mikocheni, and from Ilala to Factory Zone III via Kurasini, Mbagala and Yombo substations is expected to have some positive (beneficial), negative or neutral impacts on certain aspects of the biophysical and socio – economic environment of the project area and its surrounding. These impacts may occur during the following phases:
Mobilisation
- Preparation of site construction materials
- Stock piling of materials
- Transportation of equipment and machinery
- Security and safety

Construction
- Construction of access roads where necessary
- Camp construction (for workers)
- Site clearance for the construction of transmission towers foundations
- Erection of towers
- Stringing of conductors
- Erection of transformers
- Security and safety

Demobilisation
- Clearing of stock yard
- Rehabilitation of quarries
- Transportation of equipment and machinery
- Security and safety

Operation
- Maintenance of the transmission line - revegetation and pruning of trees
- Maintenance of access roads
- Security and safety

6.1.1 Environmental Impact Assessment Procedure
The procedure followed during the environmental impact assessment of the proposed project embraced:
- Predetermined environmental impacts, which are incorporated in the checklist (Appendix I)
- Prediction of the size of changes likely to occur on the environment. The environmental impacts, positive or negative, have been divided into three main categories: minor impacts restricted to the local area, moderate impacts confined to the project region and high impacts of national or international significance.
- Suggestion of mitigation measures of the potential negative impacts for environmental management during the construction, operation and maintenance of the project and also for enhancement of the positive impacts
- Preparation of the Environmental Management Plan (EMP)
• Preparation of the Monitoring Plan
• Estimated costs of mitigation measures and monitoring responsibilities
• Provide institutional strengthening plan

6.2 Positive impacts

6.2.1 Employment opportunities
The project will generate various direct job opportunities for both skilled and unskilled labour during construction and maintenance period. Local residents within respective project areas will take most of these opportunities. On top of the direct employment, indirect form of employment will be created in form of provision of goods and services to the project staff.

6.2.2 Economic growth and reliable electricity
The project will have indirect benefits that include impulses to socio-economic development, reduced losses to Industry, Commerce and Economic Activities and savings in foreign currency. The long-term direct positive impact is availability of good and reliable electricity. This will boost up the economic growth of the area and will increase the employment opportunities to the local population. Automatically the quality of life style will be changed.

6.3 Negative impacts

6.3.1 Land degradation and soil erosion
The proposed 132kV transmission lines cross in areas characterised by flat and hilly terrain with soil covered by mixed vegetation consisting of community forestry (based on tree planting farms), bush lands, scattered trees, wooden grassland and river channel overgrowth. Clearing of vegetation cover on the way leave to allow the excavation works for pylons foundations and access roads may open up the soil to the agents of erosion. However, taking into consideration the size of the area to be taken by one pylon foundation (four footings each 1m² and about 10m³ of soil to be excavated to be filled by concrete for each pylon) and that the existing roads save as access roads, it is expected that the impacts will be mild, local, and they will occur mostly during the construction stage (short term).

Mitigation Measures
Ground clearance should be minimised and if possible concentrated only to the specific pylon foundation areas, and only when it is necessary. Prompt reclamation of exposed soils should be done. It is advisable to start construction works immediately after long rains, once the soil has dried to some degrees. Also
application of water to the disturbed area will reduce the rate of sheet erosion. Topsoil excavated from pylon foundations should be stored for re-use on other areas like rehabilitations of quarries.

6.3.2 Air pollution
During construction, it is expected to have more vehicular traffic, which will release poisonous fumes and gases that may pollute local atmosphere. Likewise, activities like excavations for pylon foundations, rehabilitation of existing access road, cable laying and stringing and demolishing houses and structures in the way leave may generate dust especially during the dry season. Other sources of air pollution will occur due to decomposition and/or burning of the cleared vegetation and dust from gravel roads.

The level of air pollution originating from the above mentioned sources are expected to be low, localised and will occur especially during construction phase. No serious impacts are expected on people and the environment as whole.

Mitigation Measures
To minimise the negative impacts to water resources and soil and air pollution due to construction activities the following measures needed to be effected.

- Prevention of entrance or accidental spilage, of solid matters, contaminants, debris and other pollutants and wastes into surface and ground water. Good workmanship and frequent monitoring will achieve this.
- All excavated materials, debris from construction works should not be stockpiled or deposited near or on stream banks or other watercourse perimeter where they can be washed away by high water or storm run off or can any way enters to water sources itself.
- To minimise the pollution caused by dust generation during the construction stage, water should be sprinkled on the construction site and on access road as frequently as possible.
- To minimise exhaust fumes from plants and machinery, these equipments and plants should be stopped when not in use and people who are working and exposed to dust and exhaust fumes should be provided with masks. Also equipment and vehicles should be properly maintained.

6.3.3 Aesthetics and visual impact
Construction of the 132kV transmission lines will create new type of structures in some project areas. The presence of these pylon structures and conductors will permanently change the landscape within the project area. However this impact will be local and of low significance since the project is not located in the area with sensitive scenery beauty. For Kiyungi (Moshi) – Arusha (Njiro) T/L, the new line will
some how blend with the existing 132kV structures which are now common to people's eyes.

**Mitigation Measures**

Although it is not possible to eliminate the effect of visual intrusion because of their nature, towers and conductors will not blend harmoniously with landscape. The effect of visual intrusion can be minimised by avoiding cutting or pruning of trees in the RoW unnecessarily. Planting of trees (special trees which do not grow tall enough) and other vegetation should be encouraged because presence of these trees and vegetation may moderate the height and visual effect of the towers. However, there is no aesthetic mitigation measure because power transmission structure will be permanent features in the area.

### 6.3.4 Vibrations and noise

#### 6.3.4.1 Construction stage

The level of noise and vibration will increase during the construction stages only and it is localized. The raise will be mainly due to vehicles and equipment involved in the construction activities as well as due to people who will be working on the project. This is a short term impact and it will be felt mostly around construction sites and its peripherals.

Taking into consideration the technological growth in construction industry, it is expected that available modern machineries are versatile, quieter than the old ones and employ only a small number of skilled and unskilled workers. Therefore, the levels of noise and vibrations are anticipated to be within the tolerable limit. In view of the above and the fact that construction will concentrate on the linear line, no significant impact is anticipated.

#### 6.3.4.2 Operation and maintenance stage

During the operation and maintenance stage no any significant noise and vibration impacts is expected along the line as big vehicles and machinery are no more in the project area. There will be only irregular visits by lighter vehicles for maintenance purposes.

**Mitigation measures**

These effects should be minimised by provision of earplugs and earmuffs to the workers working in high peak noises during the construction stage. Also use of modern low noise machinery and vehicles is recommended. Activities that may involve noises and vibration should be abstained at night time especially close to the human settlements.
6.3.5 Loss of natural heritage

According to the World Bank, Natural habitats are land and water areas where:

i. The ecosystem’s biological communities are formed largely by native plant and animal species, and

ii. Human activity has not essentially modified the area’s primary ecological functions. All natural habitats have important biological, social, economic, and existence value.

Critical natural habitats are defined by the World Bank as:

i. Existing protected area and areas officially proposed by governments as protected areas (e.g., reserves that meet the criteria of the World Conservation Union (IUCN) classifications). Also, areas initially recognized as protected by traditional local communities and sites that maintain conditions vital for the viability of these protected areas.

ii. Sites identified on supplementary lists prepared by the Bank or an authoritative source determined by the Regional Environment Division. Such sites may include areas with known high suitability for biodiversity conservation, and sites that are critical for rare, vulnerable, migratory, or endangered species.

The project does not pass through any natural heritage sites. Therefore no loss of natural heritage will occur due to this project.

6.3.5.1 Flora

It is expected that there will be clearance of vegetation in the Right of Way along the proposed transmission line routes, during route survey work, eventual construction and operation stages. The clearance will differ in magnitude according to the project need and stage.

* Survey and construction stage

This stage will be characterised by clearance of bushes, shrubs, and pruning of trees branches. These activities will culminate into loss of vegetation either permanently or temporarily. However, in Dar es Salaam, transmission routes pass in urban built up areas and along the existing roads where natural vegetation is limited except for exotic trees. For Kiyungi (Moshi) – Njoro (Arusha) transmission line, most vegetation has been cleared due to agricultural activities and where there is vegetation cover, the cleared vegetation along the additional 20m way-leave corridor, is readily available just in the other side of the corridor and beyond.

Therefore, there will be no any loss of endangered plant species. The only notable loss will be few trees or branches of scattered indigenous or planted exotic trees. However, exotic trees can be replanted easily and since they grow very fast the pre-project state can be restored after a short period of time (3 to 5 years). The foreseen
main impact on fauna will be trees or branches of riverine vegetation (mostly Ficus species, *Ficus sycomorus*) when the transmission line crosses the rivers in Moshi – Arusha route. For Dar es Salaam, the Ilala – Factory Zone III, the line will cross the Kizinga Creek in the Indian Ocean whereby some of the mangrove trees may be disturbed during the stringing exercise.

For Moshi – Arusha T/L there are existing access roads and railway line almost close to the proposed transmission line. However, some of the roads need to be rehabilitated to allow easy accessibility to the project site. Hence no impact is expected on vegetation by the upgrading of the existing access road.

For Dar es Salaam transmission routes, no new access roads will be required, as every part of the line is easily accessible by the existing public roads in exception of few areas like Mialakua/Lugalo barracks on the Ubungo – Mikocheni route, Yombo Buza area and Nunge area on the Ilala – FZ III route where improvement of the pathways will be needed.

In all cases the construction activities may temporarily increase sediment concentration to the areas where the pylon foundations are near to the rivers, thereby temporarily affecting the water quality and aquatic biota.

Pressure on the resources and particularly firewood is expected to be very minimal on assumption that the project sites are very close to town and village centres. On linear project like this one, we expect the project to hire few skilled and unskilled workers. Unskilled workers will be hired from nearby villages along the transmission line route. Thus no permanent camps are expected on the site except for few containers for materials and equipment storage. Therefore, firewood needs will be accommodated in normal village or town energy needs. The cleared bushes and pruned branches of trees will also contribute to the town or village energy needs.

For Moshi – Arusha transmission line, the proposed project expect to utilize additional 20m from existing way leave for a whole length of approximately 70km long. This means approximately 140 hectares of land will be required for this additional line. Since majority of this land has been denuded of vegetation by agricultural activities, every bit of remaining vegetation is important considering that the area is also in semi arid condition where vegetation growth is slow. In addition, the transmission corridor runs from east to west direction whereby a strong wind is also blowing. The possible effect of clearing and pruning of bushes and trees will be to increase and expose the soil to the agent of erosion, hence increase the effect of sheet erosion. The increase of wind speed will cause rain carrying clouds to go over this area more easily causing more droughts in the area. This may be long-term effect. However, since the existing vegetation to be affected by the project is very
small (large part is already affected by agriculture) there will be no significant change from the prevailing situation in this regard because of the project. However the case may be, protection of these trees and shrubs is therefore important whenever possible and cutting or clearing should be done only when it is necessary to do so.

Operation and maintenance stage

After construction activities have been completed, no major negative impacts of the living environment can be anticipated, some trees will be allowed to regenerate but not to reach top of transmission cables. The microhabitats on the ground nearby will remain almost undisturbed for the micro flora. In that case it can be concluded that no significant impact on flora is anticipated during operation and maintenance stage.

6.3.5.2 Fauna
There is no any National Park or wildlife conservation in the project areas. Only common birds are found in the areas. Although, it may be claimed that clearing of vegetation may disturb habitats and breeding places for some bird species, human activities and particularly agriculture and wild fires have frequently disturbed most of the project area. Therefore, it is anticipated that the impact to the fauna as a result of vegetation clearance will be insignificant during construction and operation stages.

Mitigation measures
6.3.5.1 Flora
The anticipated clearance of vegetation along the RoW is the most important impact on the ecology to be caused by the project. The following measures should be implemented to minimise the impacts:

- The vegetation clearance should be minimised and restricted to the required RoW corridor during construction.
- In the project area there is limited natural-woody vegetation cover. It is therefore, recommended to reduce extensive cutting of trees along the transmission line route wherever possible especially indigenous big trees as well as exotic ones planted at settlement areas if possible by shifting the line whenever these trees are encountered.
- The current vegetation in the existing RoW should be maintained and improved to ensure that there are no big changes during construction period. Therefore, way leave management is needed. These include bush fire prevention, reforestation with right tree species, controlled animal grazing in the RoW and good farming practices. Here the local government authority in collaboration with environmental NGO's should be employed.
Rehabilitation by reforestation of fast growing trees species that can grow under infertile soil condition should be planted to the quarries and campsite immediately after demobilization.

6.3.5.2 Fauna
As there is no wild fauna in the project area, no mitigation measures are recommended. Care should be taken to protect the breeding areas for avifauna.

6.3.6 Accidents

Construction stage
Major anticipated impact during construction stage will be accidents. These accidents will affect the construction workers as well as the general public. The major sources of accident will be construction vehicles and machinery. Care should be taken during the whole process of the project in terms of accident prevention awareness and safety measures. Clear warning signs should be put in place along road to the excavated areas and the power line during operation. Protective gears and appropriate safety tools should be used in day-to-day activities when the job does require them.

Operation and maintenance stage
High voltage electricity kills instantly when come in contact with a living being without proper protection. As long as health and safety rules are in place and are enforced and work procedures are followed by both workers, and members of the public, no major impact is expected.

Mitigation measures
The following safety measure should be observed during the construction stage.

- The contractor should hold meetings with local community leaders and educate them if possible arrange for community awareness raising campaign on impending dangers and how to ensure the safety measures.
- Sign boards:
  - To warn the public on potential dangers should be erected at appropriate ongoing construction activities
  - Road signs should be displayed to warn motorists
  - Danger sign to be placed in each pylon after construction
- Awareness raising on the ways of minimising risks of bush fire outbreaks should be given to construction workers. Construction workers should be discouraged from discarding live matches and cigarettes.
- Workers should be educated on their own safety and safety of others, and they should be provided with safety gears.
- Speeding of project vehicles should be avoided and appropriate measures like speed bump should be implemented.
- Beacons and signs to show the direction of underground cable route should be placed.
- Establishment of well-stocked First Aid kits within the said sites is highly recommended.

6.3.7 Surface water quality

Construction stage
Surface water quality may be undermined due to increased erosion, run-off from roads and construction site, and contamination in the event of oil spills. The extent of this impact will depend directly on the magnitude of other causative factors such as awareness, level of clearance, etc.

Most linear projects like construction of transmission line, soil erosion during construction stage may result into changes in water hydrological situation. The change is mainly the alteration of river discharge and riverbed condition due to siltation. Thus the project may cause siltation of watercourses as a result of suspended materials in receiving water bodies. However, this impact will be temporary and only during construction stage.

Operation and maintenance stage
It is expected that during operation and maintenance stage the project will have no any significant impact on surface water quality since minimum earth works will be practised. In addition the soil will be more stable while the vegetation will have been recovered (regenerated).

Mitigation Measures
- Whenever possible minimize the unnecessary vegetation clearance or disturbance of soil
- Raise the level of awareness of employees to prevent unnecessary oil spills and protection of environment in their daily duties.

6.3.8 Aircraft flight paths

Construction and operation stage
Kilimanjaro International Airport (KIA) is located at about 4Km from the existing Kiyungi (Moshi) – Njoro (Arusha) 132kV transmission line. However, landing and taking off has not been a problem because the landing ground is parallel to the
existing transmission line. Hence, even for the proposed 132kV transmission line there will be no problem as it will be parallel to the existing line. The concerns may be only on low flying aircrafts in agriculture sector. However, there are no big farms which use spraying aircraft along the proposed route.

The proposed Ilala –Factory Zone III route traverse the Dar es Salaam International Airport on the North-eastern tip of the airport. Steel lattice towers may interfere with the landing and takeoff of the airplanes. However, TANESCO is considering using the underground cable in this area as recommended by Tanzania Airport Authority (TAA). Using the underground cable will eliminate the impact of the transmission line to the aircraft flight path.

**Mitigation measurers**

- Provision of red balloons sign hanging on conductors between two towers to alert the low flying planes on the areas where there is high risk on the planes colliding with the power line e.g. big plantations where planes are used for agriculture activities (especially pesticides spraying).
- Use underground cable in areas where the transmission line will interfere with landing and taking off of the airplanes. This is the recommendation of Tanzania Airport Authority (TAA) for the Dar es Salaam Airport on the Ilala-FZ III line

6.3.9 Soil pollution

**Construction stage**

Soil pollution due to accidental oil spills is anticipated during the construction stage. This oil spill may infiltrate into soil causing soil pollution and later water pollution during rain season. However, this impact is localised around machinery and plants yards, base camps (storage of diesel, petrol and oil), maintenance areas or garage and areas of concentrated activities. In addition the impact is temporally only during the construction stage.

**Operation stage**

During the operation and maintenance stage, the effect is expected to be low because there will be no equipment or concentrated activities which use oil, diesel and petrol except for the maintenance vehicles doing maintenance patrols.

**Mitigation Measures**

- Use containment and specially design places to store fuel, oil and other substances that may cause soil pollution. In addition maintenance of oil soaked items should be done with care if possible in a designated areas.
• Raise the level of awareness of employees to prevent unnecessary oil spills and protection of environment in their daily duties.

6.3.10 Landscape and Topography

The impact of the project on the landscape and topography can be divided into three stages i.e. During Mobilisation, Construction and Operation and Maintenance stages.

Mobilisation Stage
Landscape and topography scenic quality will be impaired by stockpiles of construction materials, whereby in every 250m there will be a stockpile of foundations works for transmission tower, excavation, quarries and denuded land strips. However, these material stockpiles will be for a short term and localised at the position of transmission towers line and quarry sites. It is also anticipated that landscaping will be done after the construction works are completed.

Construction Stage
During the construction stage it is expected that the impact will be low as well. The proposed electric power transmission lines will slowly start to blend with existing scenery. Earth works, construction materials, cable trenches, etc. will start to be used (removed from site) as the construction goes on until it is completed. It is expected that for construction of these lines there will be no huge earth works like blasting, compacting, cutting, filling and moving of earth that takes place during road construction. Existing roads will be utilized. Therefore, although the effect will remain especially the presence of pylons, good landscaping will remove unused materials (e.g. earth) and introduce the good look of the project site. Thus reduce the impact of the project on natural aesthetic beauty.

Operation and Maintenance Stages
Taking into consideration that the height of vegetation in the power line route (above ground tower type design) must be maintained below 5m, therefore, in areas where the towers are used, towers will be the most prominent induced physical feature that will dominate the landscape during the operation and maintenance stages. Towers and conductors may also partially obstruct the vision and impair the scenic natural beauty of countryside. However, since there no complains so far related to interference with vision and impairment of scenic beauty for the similar existing line it anticipated that the impact is low though permanent.

Demobilisation
Debris and litters resulted from construction and demolition activities may cause scenic degradation, pollution as well as becoming an eye - sore. This will be moderately significant, short-term and direct impact. However, it is anticipated that
the project contractor will clean the sites and do a landscaping of the project sites when all construction activities have come to an end.

**Mitigation measures**

- Efforts should be made to ensure that the existing access roads are used. In some cases the project will have to improve some of the roads to allow smooth passage.

- For Arusha – Kiyungi line a Railway line (Tanzania Railway Authority) may be used to transport construction materials. This will further reduce the need for access roads and associated effects on landscape and topography, change in habitat of flora and fauna and land degradation.

- Clearance of vegetation like trees should be minimized and restricted to required RoW as far as possible and where necessary only pruning of tree branches is recommended. These will maintain the scenic beauty created by the remaining indigenous and exotic trees, which will be found on the construction site and on the proposed transmission route.

- Rehabilitation of excavated sites, camp sites, quarries and denuded strips during stringing should be done on completion of construction; the rehabilitation effort will be complemented with landscaping and should involve planting of trees (indigenous), grass cover and other vegetation types to improve the vegetation as far as possible to the satisfaction of client and local administration.

- Removal and proper disposal of construction and demolition debris need to be effected after completion of construction works.

**6.3.11 Agriculture**

Almost 90% of the proposed Moshi – Arusha transmission line transverses a land under cultivation. The main expected impact is disturbances to farming activities and temporary loss of cultivated land, if the construction works are to be carried out during the farming season. Dar es Salaam routes have no any impact on agriculture.

**Mitigation Measures**

- To mitigate the impact on agriculture activities and reduce the conflict with farmers whose power line transverse their land, notification should be provided prior to the starting of construction works. This will enable farmers to plan appropriately the harvest or alternatively adjust cultivating and planting in the RoW.
• Utilize the existing way leaves whenever possible, use the compact design towers which need only 15m way leave corridor to reduce the potential cumulative environmental and social impacts in regard to agriculture.

6.3.12 Materials and equipment used for construction

Some material if not selected appropriately may become a source for environmental problem in the project area. Materials such as Polychlorinated biphenyl/s (PCB) and asbestos should not be used in the project. All non degradable material used during the implementation of the project if they will not appropriately disposed off they will become environmental nuisance in project sites.

Mitigation measures

• Materials and equipment to be used should be environmentally acceptable i.e. Transformer oils should be free from PCB’s.
• All litters from the construction materials like pieces of metals, broken conductors, etc. should be collected and put in safe place or disposed in environmentally friendly way.

6.3.13 Natural Hazards

Earthquakes are the most destructive natural hazards that may cause loss of human life and destruction of infrastructure. Part of the project area (Kiyungi – Njoro line) is located within the earthquake prone region. Therefore, the project implementers should consider this phenomenon as a potential risk should be further investigated during the design and implementation stages.

Mitigation measure

• The structural design of both civil and electrical works should take into account seismicity characteristics of the region.

6.3.14 Corona and Radio interference

The construction of proposed 132kV transmission line can increase the corona effect. (The corona discharge is a tendency whereby the air immediately adjacent to an electrical conductor become ionised). The corona effect is increased as voltage level increases and it is visible and audible under certain conditions mainly wetness (e.g. rain). Corona effect causes power loss in transmission lines and may also reduce radio reception due to interference with Radio frequency Band (3 kHz – 30,000MHz).
Corona effect can cause ionisation of oxygen molecules in air resulting to formation of traces of Ozone and Nitrogen Oxides (*note: breakdown of the nitrogen molecules can lead to the formation of various forms of nitrogen oxides*).

Regarding the formation of gases such as nitrogen oxide and ozone due to gas ionization around the power line conductors, researches show that the effect are insignificant and their effect on environment is negligible.

**Mitigation measures**
To minimize the corona, radio interference and gases ionization effect the following measures are recommended:

- A twin bundle conductors is proposed with standard bundle spacing. However under severe weather condition, some visual and audible corona may also be experienced though the effect is minimum and short terms.
- The final design conductors selection should take into consideration all factors affecting the radio interference such as operating voltage, tower geometry, conductor size, number of conductors in a bundle, atmospheric conditions etc. and must be within the general acceptable level.

6.4 Socio-economic impacts construction Phase

All the villages and hamlets where the proposed transmission lines pass will be directly affected by the project either positively or negatively. There will be positive impacts in terms of temporary employment opportunities and petty businesses along the power line routes. However, most of the expected impacts are of negative nature which will require mitigation measures to be put in place to counter react the impacts on local communities in the project area.

The more profound impacts will be in resettlement areas of Dar es Salaam whereby if design and technology to be used will be 40m corridor, many houses, businesses, shops and workshops located along the proposed route are going to be affected. For Arusha and Moshi line the only major impacts will be on agricultural land if there will be a restriction on land use in the right of way.

The identified impacts will occur during the construction and operation and maintenance phases. For each identified significant impact mitigation measures have been provided. The impacts are grouped in four categories:

**Impacts on the population**

- Relocation of people and their properties
- Physical presence of immigrant workers
Psychological effects and false expectations of jobs, access to electricity, etc.

**Impacts on the subsistence systems**
- Loss of agricultural land
- Loss of crops and harvests
- Loss of business opportunities and customers
- Loss of income

**Impacts on the cultural and historical system**
- Interference with historical places and cemeteries

**Other impacts**
- Production of dust and noise
- Interference with land concessions and ownership

### 6.4.1 Impacts on the population

#### 6.4.1.1 Relocation of people and their properties

The proposed routes will traverse population settlement areas in some places. For the safety reasons a 40m wide right of way will be required in all cases if the steel lattice structure towers are going to be used, 15m wide corridor if compact design tubular towers are used or about 5m corridor way leave if underground cable is used. In the right of way no residences or any type of construction is allowed. In settlement areas getting such corridors without relocating people is difficult, thus it will necessitate relocating a number of people to pave the way for the construction of the transmission line.

The use of 40m right of way will relocate more people which means huge impact to the population along the proposed line route. The use of 15m corridor will significantly reduce the number of people to be relocated compared with a 40m way leave corridor. The use of 5m corridor will further reduce the number of people to be relocated. The relocation of people causes many side effects even if someone is compensated.

**Mitigation measures**
- The project proponent should do a thorough survey to determine alternative routes that will minimize the number of people to be relocated. As public consultation meetings indicated, in spite of the cost of underground cable, TANESCO should think using this technology that will reduce the corridor to only 5m which can be laid in road reserve thus preventing a mass relocation.

- The project proponent should open the dialogue with affected families to prepare and implement the resettlement action plan that will involve the following:
Financial compensation for the loss of housing, land, crops, fruit and exotic trees
Availing all social services needed to the new settlement area (hospital, schools, water, electricity, transport, roads, etc.)
Ensuring that compensation is paid promptly and time to construct new housing is provided before the demolition of houses is effected
Continuous communication between the people to be relocated and the project proponent should be maintained in corroboration with local authorities to ensure that all affected people have appropriately compensated and resettled

6.4.1.2 Physical presence of immigrant workers
The spread of information about the implementation of the project will create employment expectations in other villages in the regions outside the affected communities. These expectations may lead to an influx of strange people to the local communities searching for employment. This will increase the likelihood of conflicts and spread of diseases.

During the construction phase camps will be installed along the selected transmission line route especially the long route of Arusha – Moshi T/L to house the workers involved in the project. These workers will of course interact with local population and conflicts of a socio-cultural nature and the transmission of diseases may occur.

This impact is likely to occur though it will be short-term only during the construction works. The impact is of high significance if there will be no mitigation measures in place.

Mitigation Measures

- Both workers and the local communities should be subject to awareness raising campaigns, so as to promote good relations and avoiding the unnecessary conflicts.
- Workers and the affected communities should receive special health care and health care education particularly the spread of sexually transmitted diseases (STDs) and HIV AIDS. If possible condoms should be available and provided to workers.
- If the contractor does not foresee hiring a large scale local work force, he should take the necessary measures to spread the information so as to discourage the influx of strange people to the local communities. However, communities directly affected by the project should be given the priority.
The contractor and the project proponent in close cooperation with local leaders and government authorities should have the monitoring system to observe the influx of people in the project zone and procedures to be followed in cases of the emergence of informal population in project sites.

### 6.4.1.3 Expectations of jobs and access to electricity

During the consultative meetings, the majority of local communities especially in rural setting accepted the project in expectation that there will be huge compensation, project will create jobs opportunities and they will get access to electricity.

This impact is very likely to occur. It is expected to be short to medium term impact. If mitigation measures are not put in place there will be significant complains and dissatisfaction with the project.

#### Mitigation measures

- As far as possible the compensation exercise should be transparent and the affected people should be involved from the beginning to the end. Also the project should incorporate the local work force as far as the job vacancies allow.

- In the contractor’s contract, work places of the local community should be stipulated and the recruitment and work conditions of the local work force should be carefully monitored.

- If the hiring of local personnel is not foreseen the proponent (TANESCO), in coordination with the local authorities, should hold meetings with the communities to inform them about this fact and explain the reasons.

- As far as possible TANESCO should take initiative to provide electricity to the villages along the Arusha – Moshi route as some of the villages like Kikwe, Kikafuchini, Kawaya, Orkereyani and Ngosero have for some time now applied for electricity connections. This measure will improve the project acceptance to the locals and in some way improve the lives of the local population.

### 6.4.1.4 Sociological loss

After staying for a very long time in their place they have developed friends, relations and attachments with neighbours - if they move out of the place it means they will loose all these long established relationships. Basically this psychological attachment cannot be replaced by any amount of money paid. Currently some of the residents are closer to town, schools, colleges, good roads, reliable transport, health facilities and many other services that are not available in the new place they will be moved.
The impact is likely to be permanent in some aspects but may be reduced if mitigation measures will be put into place.

**Mitigation measures**
- The project should make sure that they provide all social amenities like school, road, transport services, health facilities, power/electricity, water supply, shops, etc. to the new location where people will be resettled.
- If possible people should be resettled in the same district
- People should be given a chance to select a place to move to on their own rather than being allocated a place with no preference.
- The affected people should be paid a disturbance allowance though it does not cover at all their socio loss and psychological effects but people would appreciate.
- In the resettlement area the underground cable should be considered so as to move as few people as possible.

**6.4.2 Impacts on the subsistence systems**

**6.4.2.1 Loss of agricultural land**
During construction phase, particularly on the sites where the pylons will be erected, there will be permanent loss of agricultural land due to the space occupied by the pylon and if any the opening up of the access road to support construction logistics and subsequent maintenance. This loss will create serious constraints for the local communities whose subsistence is entirely dependent on agriculture.

The impact is likely to occur and it will be permanent for pylons sittings and for the access roads. The level of significance is medium but can be lowered through the implementation of mitigation measures.

**Mitigation measures:**
- Financial compensation should be paid to allow the affected to purchase another piece of land somewhere.
- Use the existing access roads whenever possible. Access roads should be allowed only when it is necessary to do so.
- In case new plots will be provided by the project proponent (TANESCO), the plots should be located near the affected person residence.
There should be no restriction on using the right of way to grow short crops such as beans, maize, paddy, etc. though farmers should be made to understand that the land in the right of way is no longer theirs

6.4.2.2  Loss of crops and harvests
During the construction phase it will be necessary to clear the access roads that traverse agricultural fields. If this happen before the harvest is done, crops and fruit trees still unharvested will be lost causing constraining effect on subsistence and programmed family income. However, the impact will be only if it is done while the crops are still in the fields. In addition for Arusha – Moshi T/L existing access roads will be used while for Dar es Salaam the biggest part is built up area rather than agricultural fields. Hence no significant impact is expected if mitigation measures will be implemented.

Mitigation Measure
➢ Fair financial compensation for the crops should be paid the crops in the proposed right of way. In addition local communities should be informed when the project is going to start so that they are not caught unaware thus they decide themselves to plant crops or not

6.4.2.3  Loss of business opportunities, income and customers
The demolition of houses and relocation of people during the construction phase will make businesses located in the proposed transmission line corridor to be destroyed or to disappear. This demolition will make business owners to loose opportunity of making their business prosper; business owners will loose some potential customers, and will be denied opportunity to continue earning some income from their businesses. The new location does not guarantee him/her of customers and business opportunity. The relocation may cause long term loss of income.

The impact of loss of income to some people may be permanent and significantly huge. Mitigation measures will help to reduce the significance of the project but may not eliminate the impact altogether.

Mitigation Measures
➢ The project proponent should provide fair financial compensation to businesses and economic activities located in the proposed right of way as required by the World Bank policy and the Land Act no 4 of 1999.

➢ If possible in collaboration with local government authorities the project proponent should help to find new business locations for the displaced people similar or close to the original location
6.4.3 Impacts on the cultural and historical system

Interference with cultural places and cemeteries
In the study area, family and communal cemeteries (burial sites) and place of worship were observed. In addition, although no places of archaeological importance have been identified in the project area, it is possible that during excavations, old objects of archaeological values may be discovered. These places may be affected by the project if measures and locations for pylons are not careful selected, thus causing conflict with the local communities.

The impact on these places may occur (likely) if care is not taken by involving the local community and local leaders to identify all areas of concerns. The destruction may be permanent. However, the impact is mitigated.

Mitigation Measures

➤ All burial sites, family or communal cemetery, should 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 T/L will interfere with these places measures should be taken to alter the direction of the route or change the seating of the pylon.

➤ In case a discovery of archaeological site is found during the excavation, measures should be taken to notify the competent authorities that will provide further guidance.

➤ In case 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

6.4.4 Other impacts

6.4.4.1 Production of dust and noise
Vegetation clearing, movement of vehicles and the operation of heavy machinery will increase of the levels of dust and noise causing nuisance and even health problems to the community surrounding the project sites. In spite that the impact will surely occur, the impact will be short term and of low significance if mitigation measures will be in place.
Mitigation Measure
The contractor should take measures to inform the communities about the start of the work and the time limit for the night time conclusion. Water Lorries should also be used to moisten the works site in areas near population settlements and the working hours should be according to the law. Whenever possible, working at night, weekends and public holidays closer to the settlements should be avoided.

6.4.4.2 Archaeology and cultural aspects

Construction stage
The only foreseeable impact during the construction of proposed 132kV line will be total or partial destruction of burial graves due to earthworks, which will involve excavation of foundation and quarrying. These activities if not aligned properly may cause negative impact to the existing cultural and archaeological resources. Some people in the project area have a custom of having cultural feasts under the Mikuyu trees (Ficus tree). Therefore cutting or pruning of these trees (Mikuyu) may affect these cultural feast sites. However it is anticipated that the effects will be minimum and localised because there are many Mikuyu trees along the rivers in the project area.

Operation and maintenance stages
During this stage of operation and maintenance it is expected that the project will have no any significant impact since there will be minimum earth works (excavation), shrubs clearance and pruning of trees.

Mitigation Measures
In order to mitigate the effect of archaeology and cultural aspects the following measures should be implemented:

- The burial sites, graves and shrines areas should be avoided during the setting of construction camps, offices, workshops storage facilities, stock pilling, cable laying or pylon foundations.
- Consultation with local population should be done whenever there is a need to establish construction camps, offices, workshops storage facilities, etc. in a certain settlement.

It is assumed that no project can be carried out without any negative impacts. The negative impacts could be reduced to a substantial degree by selection of appropriate design, careful integrated planning of the project implementation and by implementation of recommended mitigation measures.
Mitigation measures proposed in this chapter are aimed at minimising potential significant negative impacts identified in the chapter. It is anticipated that these mitigation measures will be considered and incorporated in the project cycle i.e. detailed design, bidding documents, the contract and construction of the proposed 132kV transmission lines. It will be an obligation of a proponent and a contractor to make sure that all the mitigation measures recommended in this chapter are implemented as deemed necessary.

6.5 Social-economic Impacts during Operation and Maintenance Phase

The socio-economic impacts during the operation and maintenance phase include:

- Possibility of accidents with local population
- Electromagnetic waves on human health
- Visual impacts

6.5.1 Possibility of accidents with the local population

The transmission lines may pose great danger to the surrounding population if they are not informed about the potential dangers and precautionary measures are not in place. The impact will likely affect all surrounding settlement and communities around the project area. The impact is potentially long term and if there will be no mitigation measures the impact has medium significance.

Mitigation Measures

- Awareness raising actions should be carried out, in coordination with the local authorities and local leaders, to inform the affected and surrounding communities about the dangers that a high voltage transmission line may pose. These awareness raising actions should include security precautions to be adopted by the local communities as follows:
  - To avoid children climbing the pylons
  - To avoid children playing with kites and catapults near the line
  - To avoid people seeking shelter next to the pylons, particularly during the rain and thunderstorms
  - To avoid pruning of tall trees near the power line cables
  - To avoid the handling of cables that has broken
  - To avoid rebuilding or building new structures in the right of way

6.5.2 Impacts of electromagnetic waves on human health

Even though there are no concrete scientific proofs, it is thought that the electromagnetic waves generated along the transmission line may cause health
problems to the people who are directly exposed to them for a long period of time. The exposure limits stipulated internationally define 5kV/m as the maximum allowed limit for human exposure. Thus precautionary attitude should be maintained and measures taken that may avoid the occurrence of possible effects of those waves to human health.

**Mitigation Measures**

- The recommended safety distance from power line (way leaves) regarding the resettlement of the population along the servitude of the transmission line should be observed.

- TANESCO in collaboration with local authorities should alert people about the risks that may result from the establishment of residences in the right of way and under the power line.

- Periodic monitoring should be carried out to ensure that no one is establishing a residence in the right of way and under the power line.

**Table 6.1: Summary of Environmental Impacts and Mitigation Measures**

<table>
<thead>
<tr>
<th>S/N</th>
<th>Impact</th>
<th>Phase</th>
<th>Significance</th>
<th>Mitigation measure</th>
</tr>
</thead>
</table>
| 1   | Land and soil erosion   | Construction & Operation   | Medium       | Management of way leave area:  
|     |                         | Phase                      |              | o Proper revegetation and reforestation.  
|     |                         |                            |              | o proper cultivation methods on way leave,  
|     |                         |                            |              | o awareness raising to prevent bush fire  
|     |                         |                            |              | ▶ Stabilise the soil mechanically to reduce erosion potential.  
<p>|     |                         |                            |              | ▶ Take special preventive measures whenever the pylon have to be erected in sloping places or near water course, such as replanting with species such as <em>Vetiveria zizanoides</em>, <em>Cynodon dactylon</em>. |
| 2   | Landscape and topography| Design Construction       | Low          | ▶ Minimize clearance of vegetation and trees as far as possible in the RoW (Clearance limited to what is necessary) where necessary only pruning of tree branches is recommended. |
|     |                         | Operation                 |              |                                                                                   |</p>
<table>
<thead>
<tr>
<th>S/N</th>
<th>Impact</th>
<th>Phase</th>
<th>Significance</th>
<th>Mitigation measure</th>
</tr>
</thead>
</table>
| 3   | Pollution: Water resources, air and soil | Construction | Medium | Prevention of accidental oil or chemical spillage, solid matters, contaminants, debris and other pollutants and wastes from entering into surface and ground water.  
Awareness on environmental protection  
Avoid deposition of stockpiling materials near or on stream banks or other watercourse perimeter  
To minimise dust generation, water should be sprinkled on the construction site and on access road as frequently as possible.  
Stop plants and machinery when not in use  
People who are working and exposed to severe dust and exhaust fumes should be provided with respirator masks. |
|     |        | Operation |       |                    |
| 4   | Aesthetic Visual Intrusion | Construction & Operation | Low | Visual intrusion to be minimised by avoiding cutting or pruning of trees in the RoW unnecessary.  
Planting of trees (special trees which do not grow tall enough) and other appropriate vegetation should be encouraged |
| 5   | Noises and Vibration | Construction | Low | Noise from construction machinery is not expected to a problem, as few machinery will be used and for short period only. The transmission line construction through villages (communities) will take few days or weeks to be completed. |
| 6   | Ecological Resources Flora  
*However, the base line study has revealed that there is no endangered, endemic or threatened species* | Construction | High | The vegetation clearance should be minimised and restricted to what is required for safety and access corridor during construction.  
Reduce extensive cutting of indigenous big trees as well as exotic ones planted at settlement areas if possible shifting the line whenever these trees are encountered  
Maintain and improve the current vegetation in the existing RoW to ensure that no big changes occur during construction period. Also implement way leave management plan (i.e. bush fire prevention, reforestation with right tree species, controlled animal grazing in RoW and good farming practices). |
<table>
<thead>
<tr>
<th>S/N</th>
<th>Impact</th>
<th>Phase</th>
<th>Significance</th>
<th>Mitigation measure</th>
</tr>
</thead>
</table>
| 7   | Accidents                                  | Construction and Operation   | High         | ➢ Hold meetings with local community leaders to educate them and arrange for community awareness raising campaign on impending dangers and how to ensure the safety measures are observed  
➢ Erected Sign boards to  
  o Warn the public on potential dangers at appropriate ongoing construction activities  
  o Warn the motorists on road conditions and speeding  
  o Warn the public about risk of electrocution on each pylon after construction (Danger sign)  
  o Educate workers on their own safety and safety of others, and provision of safety gears |
| 8   | Archaeology and cultural aspects           | Construction                 | High         | ➢ There are some burial and shrine sites in the proposed transmission line route. Disturbances of these sites should be avoided. All known sites should be well marked prior to construction to avoid any unnecessary disturbances. Contractor should be responsible to inform her employees on location of these sites. |
| 9   | Aircraft path                              | Construction & Operation     | Medium       | ➢ Provision of red balloons signs hanging on conductors  
➢ Use of underground cable especially at DIA area |
| 10  | Materials and equipment used for construction | Construction and Operation   | Medium       | ➢ Transformer oils should be free from PCB’s  
➢ All litters from the construction materials like pieces of metals, broken conductors, etc. should be collected and put in safe place or disposed in environmentally friendly way. |
| 11  | Natural Hazards                            | Design, Construction & Operation | Low        | ➢ The structural design of both civil and electrical works should take into account seismicity characteristics of the region. |
| 12  | Corona, Radio Interference and Gases       | Operation                    | Low          | ➢ A twin bundle conductors is proposed with standard bundle spacing  
➢ The final design of conductors should take into consideration all factors affecting the radio interference such as operating voltage, tower geometry, conductor size, number of conductors in a bundle, atmospheric conditions etc. and must be within the general acceptable level |
| 13  | Agriculture                                | Construction                 | Medium       | ➢ Notification to be provided prior to the starting of construction works to enable farmers to harvest or alternatively adjust planting in the Right Of Way |
| 14  | Demobilization of camps and construction sites | Construction              | Low          | ➢ Rehabilitation by reforestations of fast growing trees species that can even grow under infertile soil conditions should be planted to the quarries and campsite immediately after demobilization. |
Table 6.2: Summary of Socio Economic Impacts and Mitigation Measures

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Phase/Op.</th>
<th>Impact Significance</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Loss of house, land, plot, crops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Financial Loss</td>
<td>Construction</td>
<td>High</td>
<td>➢ Compensate business houses, money for business</td>
</tr>
<tr>
<td>2.1 Loss of business and tenants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Sociological loss:</td>
<td>Construction</td>
<td>High</td>
<td>➢ Resettle people from same area in one area/resettle people where there are some people living there. Hold meetings to create friendly environment among the community members.</td>
</tr>
<tr>
<td>3.1 Loss of neighbours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Loss of social services like schools, health facilities etc.</td>
<td>Construction</td>
<td>High</td>
<td>➢ Construct social services like school water supply, health centres, dispensaries, shops, roads, markets, public transport, churches, mosques, etc.</td>
</tr>
<tr>
<td>5. Psychological loss</td>
<td>Construction</td>
<td>High</td>
<td>➢ Pay disturbance allowances to all affected</td>
</tr>
<tr>
<td>6. Transmission of HIV/AIDS between constructing workers and community</td>
<td>Construction + Operation</td>
<td>Medium</td>
<td>➢ Awareness raising and education on HIV/AIDS among the workers and the affected community</td>
</tr>
<tr>
<td>6.1 HIV/AIDS among the workers</td>
<td></td>
<td></td>
<td>➢ Providence of protective gears (condoms)</td>
</tr>
<tr>
<td>7. Local people employment</td>
<td>Construction</td>
<td>Medium</td>
<td>➢ Employment to youths in the affected communities</td>
</tr>
<tr>
<td>8. Safety</td>
<td>Construction + Operation</td>
<td>Medium</td>
<td>➢ Setting warning signs of dangers and traffic</td>
</tr>
<tr>
<td>8.1 General safety procedures during construction</td>
<td></td>
<td></td>
<td>➢ Providence of safety gears</td>
</tr>
<tr>
<td>8.2 Traffic, electrocution</td>
<td></td>
<td></td>
<td>➢ Awareness of the potential dangers</td>
</tr>
<tr>
<td>8.3 General safety procedures during construction</td>
<td></td>
<td></td>
<td>➢ Avail safety procedures to workers</td>
</tr>
<tr>
<td>9. Impact of the land use on the Right of Way</td>
<td>Operation</td>
<td>Low</td>
<td>➢ Inform the community of the right uses of the right of way including plants that are not allowed to be grown on the right of way</td>
</tr>
<tr>
<td>10. Population increase</td>
<td>Construction</td>
<td>Low</td>
<td>➢ Information dissemination to reduce employment expectation of the local workforce outside the project area</td>
</tr>
<tr>
<td>11. Loss of security</td>
<td>Construction</td>
<td>Low</td>
<td>➢ When hiring local workforce give priority to the affected communities</td>
</tr>
<tr>
<td>12. Interference with graves, cemetery and cultural sites</td>
<td>Construction</td>
<td>Low</td>
<td>➢ Control the number of new comers who are jobless</td>
</tr>
<tr>
<td>13. Production of dust and noise</td>
<td>Construction</td>
<td>Low</td>
<td>➢ Improve security measures</td>
</tr>
<tr>
<td>13.1 Prevention of dust and noise</td>
<td></td>
<td></td>
<td>➢ Avoid them by altering the route or pylon sitting</td>
</tr>
<tr>
<td>13.2 Cultural sites</td>
<td></td>
<td></td>
<td>➢ Request authorization from relatives, religious leaders and proponent to bear the moving costs</td>
</tr>
<tr>
<td>13.3 Noise</td>
<td></td>
<td></td>
<td>➢ Use water lorries for moistening the work sites in resettlement areas</td>
</tr>
<tr>
<td>13.4 Cultural sites</td>
<td></td>
<td></td>
<td>➢ Limit the working times if the impact is severe especially in week end and holidays around</td>
</tr>
<tr>
<td>Impacts</td>
<td>Phase Cons./Op.</td>
<td>Impact Significance</td>
<td>Mitigation</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----------------</td>
<td>--------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 14 Impacts of electromagnetic waves on human health | Operation       | Low                | > Adherence to the recommendation by TANESCO relative to the distances for setting up the residential houses  
> Sensitize the population about the potential health risk of setting up residences under the high voltage line or RoW  
> Restrict people to build under the line or within the safety zone | human settlements |
CHAPTER 7
ANALYSIS OF ALTERNATIVES

The construction of 132kV electric power line from Moshi (Kiyungi Substation) to Arusha (Njoro Substation), Ubungo to Mikocheni, and Ilala – Kurasini- Mbagala- Yombo to Factory Zone III will have the following alternatives:

- Alternative 0: No Project scenario (i.e. not constructing the lines)
- Alternative 1: Project scenario (i.e. constructing the lines)

7.1 No project scenario

The assumption made here is that if construction of 132kV transmission lines does not go ahead existing forces for change, either discernible or foreseeable, will continue. This applies to forces at play in the systems of the physical, living and human environments, and to the interactions between them. Worse still will be the conditions of the Moshi, Arusha and Dar es Salaam consumers who will continue to live without reliable and quality power supply hence hinder the industrial growth.

The landscape changes will also continue to happen as a result of natural process and human and other living and non-living things interactions. Continuous processes like weathering, soil formation, erosion, transport and deposition of sediments respond to the changes during the following cycle of landscape development, which also is influenced by short or long term changes in climate, vegetation cover and human land use. A particular geomorphological event includes a number of temporal scales and therefore an environmental baseline assessment of the physical environment often is nothing more than a synoptic presentation of different development trends. Consequently, only instantaneous and short-term geomorphological events could be predictable in an EIA perspective, especially when including a no development scenario.

For Arusha and Moshi the proposed line route which will be parallel to the existing 132kV line passes virtually in area where it can be said is non forest. The whole line route passes in agricultural fields. This means human need for land, fuel wood and other development has already deprived the once existing forests reducing the vegetation cover to such an extent that soil erosion will continue to be accelerated even without this proposed project.
Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

For Dar es Salaam the transmission line routes pass through urban settlement with few portions passing in empty lands of Mlakua TP, Yombo TP and Vijibweni.

Socially, at individual level, the no project scenario provide the situation whereby no person is going to be displaced or relocated thus life will continue to be as it is in the individual family. There will be no loss of properties, no loss of income, no relocation hassles and no psychological impacts as a result of the project. However, loss of income can result from many things the same with psychological impact and loss of property.

But at national level and a society as a whole, the no project scenario brings nothing but disaster in national development. A no project scenario will cost dearly the national development by denying new investments while many people will not get electricity in their houses. According to Lahmeyer (2004) report electricity power demand for Moshi and Arusha regions is increasing rapidly necessitating the construction of new 132kV line if quality of electricity delivery is to be maintained. For Dar es Salaam region many areas face low voltage and outages.

If construction does not take place delivery of electricity and distribution will continue to be poor resulting to social dissatisfaction, fall of economic development and poor quality of life in project area and Tanzania as a whole. It should be remembered that hospital, schools, hotels, industries, banks, residential all need quality electricity to function well.

In spite of the fact that the no project scenario does not relocated anybody, it does not guarantee that the existing environmental quality will continue to be maintained. And at the same time the large society of people in Arusha, Moshi, Dar es Salaam and Tanzania in general do not benefit rather they are going to loose in terms of development, quality of life, increased pollution and deforestation in some areas. The toll of fuelwood and production of charcoal have already depleted the natural resources around many of the urban centres. Other electricity source alternatives (Solar and wind energy) are still expensive or rather not feasible in the meantime. If businesses, homes and workshops are not getting quality grid electricity will embark in using diesel/petrol generators that will continue to pollute the air.

7.2 Project scenario

They're many negative and positive impacts to be associated with the project since there is no project without impacts. The indirect benefits include impulses to socio-economic development, reduced losses to industries and commerce and saving in foreign currency. Take note that the proposed project will be in area where the environmental degradation has already taken place. The impacts of implementing the
project discussed in chapter six are categorized as environmental and social impacts. The detailed social impacts assessment is available in social impact assessment report and detailed resettlement mitigation measures are available in Resettlement Action Plan (RAP) document which are submitted separately.

7.2.1 Preferred Route: Moshi – Arusha Transmission Line

The planned 132kV electric power transmission line from Kiyungi substation (Moshi) to Njiro substation (Arusha) is to run parallel to the existing 132kV electric power transmission line. A new 132/33kV substation will be installed near Kilimanjaro International Airport (KIA).

The existing 132kV line carries a single circuit system and it is composed of 218 lattice steel towers numbered from East to West (Kiyungi – Njiro). The transmission line is about 70km long and has 60m way leave corridor (30m each side from centre line). The proposed transmission line will start from Kiyungi substation, which is located about 15km outside of Moshi municipality, then the line will traverses westwards through Hai and Arumeru Districts and finally for about 1.5 km on the territory of Arusha municipality to reach Njiro Substation\(^7\). From Kiyungi to KIA the proposed line is on the northern side of the existing line and from KIA to Njiro the line is located in southern side. Kilimanjaro International Airport is located on the western edge of Hai district, some 30 km (aerial) from Moshi.

The pylon projected for the proposed line is mixture of the lattice steel towers and compact design line (the figures showing height, foundation, spacing from one tower to another, servitude and way leave corridors are appended). The detailed technical descriptions are available in a report prepared by Lahmeyer.

The proposed Moshi – Arusha 132kV line will pass parallel to the existing 132kV transmission line. The following factors were used in optimization of route location either south or north of existing line. However the position of entrance at Njiro substation suggest that the line pass in southern side while the exiting at Kiyungi substation suggests the line pass in the northern side of the existing line due to presence of entry and exit of 132kV and the 66kV transmission lines from Hale and Nyumba ya Mungu respectively.

7.2.1.1 Alternative Analysis and Criteria of Route Selection

1. Economic parameters

   Route Length

---

\(^7\) See Map showing the Kiyangi – Njiro transmission line
The route length will be the same as the existing one because the proposed line will be passing parallel to the existing with the advantages of using the 30m way leave of the existing line, which will significantly reduce the compensation cost. It is proposed to have only one crossing at KIA substation to avoid the costs associated with 132kV lines crossing each other (crossing would need tall angle towers which are more expensive).

- Compensation cost

Compensation cost will be very high when you are entering the Njoro substation on both sides north or south of the existing line there are high grade houses. Otherwise in between there are few houses and fields which will require moderate cost of compensation.

Note that Land Act of 1999 stipulates items to be compensated; houses, land, disturbance, transport up to 20km, crops, trees etc. all in market value. Thus compensation might be very high if the route is not selected appropriately.

- Type of transmission technology to be used (overhead towers or underground cables)

The table below provides the cost of transmission line technology per kilometre to be chosen from. These construction costs per kilometre when added with compensation costs of a particular section (area) will help to determine the least cost option. However, the final decision will consider the social impact and comments or concerns from stakeholders.

Table 7.1: The cost of overhead towers and underground cables

<table>
<thead>
<tr>
<th>Type</th>
<th>Underground cable</th>
<th>Overhead Towers Compact design</th>
<th>Overhead Towers Lattice steel towers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per Km</td>
<td>400,000 USD</td>
<td>84,500 USD</td>
<td>85,000 -100,000 USD</td>
</tr>
</tbody>
</table>

2. Technical parameters

Technical limitations will also determine the right selection of the technology to be used and the required width of ROW. This includes the need for extra

---

8 The costs have been obtained from different cable manufacturers and TANESCO experience on steel towers structures. Manufacturers include African Cable of South Africa.
Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

protection, technology and ability to maintain. Increase of corona effect and control of electromagnetic fields in case of the underground cable.

3. Social and environmental parameters

- Effect on resettlement – social economic effects
  It is undeniable fact that relocation of people brings many social impact ranging from psychological, breakage of society ties to loss of properties. Although compensation for certain properties and disturbance is paid it does not cover everything and particularly psychological effects. Hence it should be as minimal as it is possible and when it is necessary to do so. For a portion of 1.5 km as you enter Njiro substation either side of the existing line will involve a relocation of about 20 homes of high class buildings if lattice steel towers are going to be used. Hence other options need to be looked at.

- Effect on biophysical environment
  The other factor that would have determined the route alignment is environmental parameters. However, for this transmission line there is no much effect on biophysical environment to influence the route realignment.

Therefore from the factors above it is likely that compact design towers seems to be suitable for the portion of 1.5km as you enter Njiro substation since only 15m ROW is required while for the rest of the line normal lattice steel towers can be used taking also the advantage of 30m corridor of the existing transmission line.

7.2.2 Preferred Routes: Ubungo – Mikocheni and Ilala – Factory Zone III

7.2.2.1 Route description: Ubungo – Mikocheni Transmission Line
  The new planned 132kV electric power transmission line from Ubungo S/S to Oysterbay S/S is proposed first to run on the western side of Sam Nujoma Road it crosses a small residential and small business premises in the area between the Morogoro Road and University Road (Ubungo area). After the university Road the line crosses the Sam Nujoma Road and run to the eastern side (densely populated and high grade houses) up to the road going to University College of Land and Architectural Studies, (UCLAS) then crosses again the Sam Nujoma Road perpendicularly and then follows the UCLAS road on northern side up to Savei area bridge where it turn to the right.

At Savei area the T/L crosses densely settlement (high grade houses and shops) up to the Mlalakuwa streamlet from there it follow the Mlalakuwa streamlet
northeastwards passing largely the army area, which consists mainly of small agricultural plots and occasionally scattered trees. Before it reaches Old Bagamoyo Road the transmission line will come very near to Mialakuwa streamlet\(^9\). After reaching the Old Bagamoyo road the proposed line turns southeast to run along the eastern side of the Old Bagamoyo road to the proposed site for New Oyster bay Substation next to the TANESCO regional office.

### 7.2.2.2 Route description: Ilala- Factory Zone III T/L

Starting from Ilala substation located close to TBL the line passes Mchikichini Hamlet up to Uhuru road in Mchikichini Ward. After crossing the Uhuru road the line enters Gerezani Ward. In this ward only institutional properties are located these include Uhuru Primary School belonging to Ilala Municipal Council, warehouse (godowns) belonging to Tanzania Railway Authority.

From Gerezani Ward the line passes Kilwa Road Bridge to Kurasini Mivinjeni Hamlet followed by Kurasini Minazini Hamlet both in Kurasini Ward before reaching the Kurasini Substation.

From Kurasini Substation the line crosses the ocean creek to Vijibweni Hamlet, followed by Kibene and Mkwajuni Hamlet all located in Vijibweni Ward (Kigamboni Vijibweni). From Mkwajuni Hamlet the line touches Tuangoma Ward before reaching Mbagala Kuu Ward. In Toangoma only empty fields will be touched. In Mbagala Kuu Ward the line is located in Mbagala Kibonde Maji and Mbagala Zakhem. From Mbagala Kuu Ward the line passes Mbagala Kibonde Maji, Rangi tatu and Zakhem Hamlets before arriving at Mbagala Substation.

From Mbagala Sustation located in Mbagala Charambe Ward, the line passes Kurasini Mji Mpya and Nzasa A Hamlets, which are located along southern side of TAZAMA Pipeline. Both hamlets are in Mbagala Charambe Ward. Then the line passes through Yombo Buza Hamlet followed by Yombo Vituka Hamlet before arriving at proposed Yombo Sustation site. Yombo Substation is located in Yombo Vituka Hamlet in Yombo Vituka Ward.

From Yombo substation the line passes again in Yombo Vituka Hamlet. The line crosses the area belonging to JWTZ (Tanzania People’s Defence Forces) before reaching the Tanzania Zambia Railway Authority (TAZARA). Then the line passes parallel to TAZARA railway. Close to cemetery area, the line crosses the TAZARA railway to cemetery area into Kigilagila Hamlet in Kiwalani Ward. From Kiwalani Ward the line crosses the Dar es Salaam International Airport on eastern tip of the

\(^9\) The line (foundation towers) comes closer to streamlets to avoid high-grade houses at Mialakuwa.
runaway before entering the Kipawa Hamlet in Kipawa Ward. In Kipawa Hamlet the proposed line runs parallel with Jet Club road and Nyerere Road before crossing the road to Kipawa Factory Zone III substation.
They're many negative and positive impacts to be associated with the project. The indirect benefits include impulses to socio-economic development, reduced losses to industries and commerce and saving in foreign currency. Take note that the proposed project will be in urban area where the environmental degradation has already taken place.

7.2.3 Alternatives Analysis and Criteria of Route Selection
The proposed Ubungo – Oysterbay (Mikocheni Office) 132kV transmission power line will pass parallel to the Sam Nujoma road, crosses Sinza, Survey and Mlalakuwa areas up to Old Bagamoyo road then it follow the Old Bagamoyo road passing Bonde la Mpunga Hamlet up to the proposed new Oysterbay substation. In route selection a number of considerations were taken into account in optimization of route alignment to reduce impacts on communities. However Dar es Salaam has densely built areas and University of Dar es salaam objected to use their land to pass high-tension transmission line, which make the route selection to consider various alternatives available. Factors considered are similar to Moshi – Arusha route which include:

1. Economic parameters

Compensation and socio economic costs

Compensation and socio economic costs are very high in densely populated area like Dar es Salaam. Therefore the route selection considered options and trade off, which aim to reduce the compensation costs and social impacts. Economics of three options; use of underground cables which need only 5m corridor, compact design which need 15m corridor and normal steel lattice towers that require 40m corridor were considered and evaluated in comparison with social economic cost. Details to be presented in a RAP report.

Other factors include type of transmission line and its construction costs (see the Table 7.1 above), technical, social and environmental parameters. According to the reconnaissance valuation done by the valuation consultants, the cost of compensation and resettlement is very high in Dar es Salaam. This means also that social economic effect is as well very high. The effect on biophysical environment is negligible since Dar es salaam is urban area and environmental degradation have already occurred, no forest and sensitive ecological sites excepts for the exotic planted tree species and gardens which can easily be mitigated.
Therefore in order to reduce the effects on resettlement and socio economic costs, mix of different designs i.e. underground cables, compact design and steel lattice towers is recommended.

**Type of transmission technology to be used (overhead towers or underground cables)**

The technologies to be used differ in costs as indicated in Table 7.1 above.

2. **Technical parameters**

Technical limitations will also determine the right selection of the technology to be used and the required width of ROW. This includes the need for extra protection, technology and ability to maintain the line and protection of electromagnetic effects.

3. **Social and environmental parameters**

**Effect on resettlement -- social economic effects**

Relocation of people brings many social impact ranging from psychological, breakage of society ties to loss of properties. Although compensation for certain properties and disturbance is paid it does not cover everything and particularly psychological effects. Areas like Sinza, Ilala, Kurasini, Mbagaia, Buza, Yombo and Kiwalani all are highly built areas. Poor route alignment and choice of technology to be used will force many people to be relocated. Hence critical route selection needs to be looked at.

**Effect on biophysical environment**

Effects on biophysical environment need also to be considered in determining the route alignment. However, for these proposed transmission lines there is no big effect on biophysical environment to influence the route realignment.

Therefore from the factors above criteria the following alternatives are presented:

**Alternative I**

**Alternative I: 40m Way Leave Corridor**

If lattice steel towers are used throughout the proposed routes which uses 40m way leave corridor, many properties and settlements will be affected since the proposed transmission lines mostly passes through built up areas. A reconnaissance survey indicates that for the Kurasini – Factory Zone III (through Mbagaia, Yombo Mwanagati Kigilagila and Kipawa), approximately Tshs 20,886,600,000.00 is required as compensations costs, 1,596 properties and 8,070 people will be affected. While for the Ubungo – Mikocheni (New Oysterbay
Substation), approximately Tshs. 22,912,000,000 is required as compensation cost, 381 properties and 1905 people will be affected.

**Alternative I: 15m Way Leave Corridor**
If compact tubular poles are used throughout which uses 15m way leave corridor a good number of properties and settlement are going to be affected although not as compared to 40m RoW. A reconnaissance survey indicates that for this alternative approximately Tshs. 9,843,250,000.00 is required as compensation costs, 832 properties and 4240 people will be affected for the Kurasini – Factory Zone III (through Mbagala, Yombo Mwanagati Kigilagila and Kipawa). While for the Ubungo – Mikocheni (New Oysterbay S/S), approximately Tshs. 11,696,000,000.00 is required as compensation cost, 161 properties and only 805 people will be affected.

**Alternative I: 5m Way Leave Corridor**
If underground cable is used throughout which uses about 5m way leave corridor fewer people will be relocated and the compensation costs is going to be down, but the construction costs become much higher (four times the normal steel lattice towers and compact designs). A reconnaissance survey shows that approximately Tshs. 5,738,250,000.00 is required as compensation costs, 115 properties and 575 people will be affected for the Kurasini – Factory Zone III 132kV transmission line. While for the Ubungo – Mikocheni (New Oysterbay S/S) approximately Tshs. 7,456,000,000.00 is required as compensation cost, 115 properties and 575 people will be affected. However, these values for the underground cable will be lower in actual sense because the reconnaissance utilized the same centreline rather than one edge bordering the road reserve.

**Alternative II**
For optimization purposes and reduction of social economic and environmental effects, another alternative was considered which include the combinations of different tower designs and underground cables in different route segments to have a least cost options. With these combinations it was possible to reduce compensation costs and automatically reduction of the number of affected properties and people to be resettled. Hence there is a reduction of social economic and environmental effects. The compensation costs for the same route from Ilala – Factory zone III was reduced from Tshs. 20,886,600,000.00 to 7,147,026,000.50 (taking the worst case of 40m way leave). For the Ubungo – Mikocheni 132kV transmission power line, the compensation costs drops from Tshs. 22,912,000,000.00 to 7,286,500,000.00.
Alternative III

Alternative III considered a combination of least cost options and utilization of the existing 33kV line or road reserve and route realignment. Here the least cost options were modified to consider utilizing areas where there are existing 33kV lines on road reserves. In other areas, route realignment and change in route direction was considered. Therefore, from these combinations of least cost options (i.e. mixtures of underground cables and compact design in different segments), changes in route alignment and route direction the compensation cost for the 132kV line from Ilaa – Factory zone III reduced from Tshs. 7,147,026,000.50 (considering the least cost options) to Tshs. 3,497,362,000.00. For the Ubungo – Mikocheni 132kV transmission power line, the compensation costs dropped from Tshs. 7,286,500,000.00 (least cost options) to only Tshs. 363,000,000.00.

The only constraints for this option is reaching an agreement and obtaining clearance from other institutions and authorities like Ministry of Works, UCLAS TRC, TAZARA and TAA to use the existing 33kV line or road reserve to lay underground cables.

Therefore it is recommended that for Dar es Salaam routes, alternative III should be used. This means using a mixture of least cost options, use of existing 33kV line corridors, using road reserves and also route directions realignment. The advantage of using this option is the biggest reduction of compensation cost and reduction of socio economic and environmental effects.
CHAPTER 8

IMPLEMENTATION OF ENVIRONMENTAL MITIGATION MEASURES,
MONITORING AND ENVIRONMENTAL MANAGEMENT AND TRAINING.

8.1 Implementation of environmental mitigation and monitoring measures

8.1.1 Implementation of Environmental Management Plan

In order to maintain the social and environmental integrity of the project area and maintaining project sustainability, mitigation measures need to be implemented and monitored. For impartiality, monitoring should be carried out by client (TANESCO) in collaboration with independent body or authorities and organizations mostly from Municipal and District Authorities (Kinondoni, Ilala, Temeke, Arusha, Arumeru, Hai and Moshi). Others monitors may come from project Contractors, Directorate of Environment in the Vice President Office and the National Environment Management Council (NEMC). The involvement of these bodies should be in different phases of the project as indicated in the Table 8.1.

It is therefore recommended that the content of this report should be made available to all concerned and interested parties for monitoring exercise during the construction and operation phases.

A clause about Environmental Protection obligation and Specification should be incorporated in the Contract Document. Under the clause it should be stipulated clearly that it is a contractual duty for the contractor to take due cognisance of the environmental concerns highlighted in this EIA report. A senior supervisor should be assigned a responsibility to oversee the implementation of the mitigation measures.

To implement the recommended environmental mitigation measures we propose funds from project to be set-aside for environmental costs for the proposed 132kV transmission lines. Contractor costs should be borne by the construction costs while other costs for TANESCO staff and independent body or authorities should be borne by TANESCO through project environmental costs.

The environmental costs should include costs for way leaves management plan (reforestation and revegetation, land use, good agriculture practices and environmental protection awareness), compensation costs, and monitoring works during construction and operation stages and for capacity building in environmental
management for TANESCO staff (Head Office) who are working at environmental unit and at transmission lines and substations.

Project Implementation Unit (PIU) on environmental matters will be within TANESCO head office environmental unit. One environmental project coordinator who will be responsible for implementation of EMP and other environmental matters for the whole Distribution and Transmission Rehabilitation for Moshi, Arusha and Dar es Salaam project should be appointed. However, all parties involved in the power line construction project work team i.e. Project consultant, contractors and environmental project coordinator will be responsible with environmental matters of the project. The project at different times will seek advice from district and municipal experts (natural resources, land and agriculture officers) during the project implementation.

8.1.2 Environmental Monitoring Plan

Environmental monitoring is an integral part of the environmental project management process. Environmental monitoring rationally completes the process that begins with the establishing the environmental baseline, carrying out the environmental impact assessment, implementing of mitigation measures and ultimately, monitoring the success of those measures during design, construction, operation and maintenance of the project. Monitoring plan is summarized and presented in Table 8.2. The recommended monitoring system distinguishes between:

1. Environmental impact monitoring and
2. Mitigation implementation monitoring

The first covers the impact of the project at all its stages - planning, construction and operation.

The second monitoring covers the actual implementation of agreed mitigation measures at all stages of the project and their impacts. A distinction is drawn between those measures which are integrated in the (engineering) design of the Transmission line project itself and those which remain ancillary to it.

Environmental impact monitoring

Monitoring of the impact of the project will be necessary in order to identify successes and failures. It should be carried out under the control of a structure independent of the developer. These monitoring parameters include land and soil erosion changes, pollution (water resources, air and soil), ecological changes (flora) corona effects and social impacts after relocation.
### Table 8.1 Mitigation Plan

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation measure</th>
<th>Moshi to Arusha T/L</th>
<th>Ubungo to Mikocheni T/L</th>
<th>Ilala to FZ III T/L</th>
<th>Responsible body</th>
<th>Tentative Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Land and soil erosion</td>
<td>➤ Management of way leave area: Proper revegetation and reforestation, proper cultivation methods on way leave, awareness raising to prevent bush fire</td>
<td>C, OP</td>
<td>C, OP</td>
<td>C, OP</td>
<td>TANESCO, Contractor and District Council Authorities i.e. Forestry, Agriculture.</td>
<td>15,000</td>
</tr>
<tr>
<td></td>
<td>➤ Stabilise the soil mechanically to reduce erosion potential.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>➤ To take special preventive measures whenever the pylon have to be erected in sloping places or near water course, such as replanting with species such as Vetiveria zizanoides, Cynodon dactylon.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Landscape and topography</td>
<td>➤ Minimize clearance of vegetation and trees as far as possible in the RoW (Clearance limited to what is necessary) where necessary only pruning of tree branches is recommended.</td>
<td>D, C, OP</td>
<td>D, C, OP</td>
<td>D, C, OP</td>
<td>Contractor, Consultant and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>3 Pollution Water resources, air and soil</td>
<td>➤ Prevention of accidental oil or chemical spillage, solid matters, contaminants, debris and other pollutants and wastes from entering into surface and ground water.</td>
<td>C, OP</td>
<td>C, OP</td>
<td>C, OP</td>
<td>Contractor, Consultant and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td></td>
<td>➤ Awareness on environmental protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>➤ Avoid deposition of stockpiling materials near or on stream banks or other watercourse perimeter</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>Contractor Consultant and TANESCO</td>
<td>NIL</td>
</tr>
</tbody>
</table>
### Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation measure</th>
<th>Moshi to Arusha T/L</th>
<th>Ubungo to Mikocheni T/L</th>
<th>Ilala to FZ III T/L</th>
<th>Responsible body</th>
<th>Tentative Cost USD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To minimise dust generation water should be sprinkled on the construction site and on access road as frequently as possible.</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>Contractor, Consultant and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td></td>
<td>Stop plants and machinery when not in use</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>Contractor, Consultant and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td></td>
<td>People who are working and exposed to severe dust and exhaust fumes should be provided with respirator masks.</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>Contractor, Consultant and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>4 Aesthetic Visual Intrusion</td>
<td>Visual intrusion to be minimised by avoiding cutting or pruning of trees in the RoW unnecessary.</td>
<td>C, OP</td>
<td>C, OP</td>
<td>C, OP</td>
<td>Contractor Consultant and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td></td>
<td>Planting of trees (special trees which do not grow tall enough) and other appropriate vegetation should be encouraged</td>
<td>C, OP</td>
<td>C, OP</td>
<td>C, OP</td>
<td>Contractor Consultant and TANESCO</td>
<td>5,000</td>
</tr>
<tr>
<td>5 Noises and Vibration</td>
<td>Noise from construction machinery is not expected to a problem, as few machinery will be used and for short period only. The transmission line construction through villages (communities) will take few days or weeks to be completed.</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>Contractor / TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>Impact</td>
<td>Mitigation measure</td>
<td>Moshi to Arusha T/L</td>
<td>Ubungo to Mikocheni T/L</td>
<td>Ilala to FZ III T/L</td>
<td>Responsible body</td>
<td>Tentative Cost USD</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>-------------------------</td>
<td>---------------------</td>
<td>-----------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td><strong>6</strong> Ecological Resources Flora</td>
<td>➤ The vegetation clearance should be minimised and restricted to what is required for safety and access corridor during construction. ➤ Reduce extensive cutting of indigenous big trees as well as exotic ones planted at settlement areas if possible shifting the line whenever these trees are encountered. ➤ Reduce extensive cutting of indigenous big trees as well as exotic ones planted at settlement areas if possible shifting the line whenever these trees are encountered</td>
<td>D, C, OP</td>
<td>D, C, OP</td>
<td>D, C, OP</td>
<td>Contractor / TANESCO</td>
<td>Cost covered in item 1</td>
</tr>
<tr>
<td><strong>7</strong> Accidents</td>
<td>➤ Hold meetings with local community leaders to educate them and arrange for community awareness raising campaign on impending dangers and how to ensure the safety measures are observed. ➤ Erected Sign boards to o Warn the public on potential dangers at appropriate ongoing construction activities o Warn the motorists on road conditions and speeding o Warn the public about risk of electrocution on each pylon after construction (Danger sign) o Educate workers on their own safety and safety of others, and provision of safety gears</td>
<td>C, OP</td>
<td>C, OP</td>
<td>C, OP</td>
<td>Contractor / Local Government / TANESCO</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>8</strong> Archaeology and cultural aspects</td>
<td>➤ There are some burial and shrine sites in the proposed transmission line route. Disturbances of these sites should be avoided. All known sites should be well marked prior to construction to avoid any unnecessary disturbances. Contractor</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>Contractor / TANESCO in collaboration with District and Local</td>
<td>NIL</td>
</tr>
<tr>
<td>Impact</td>
<td>Mitigation measure</td>
<td>Moshi to Arusha T/L</td>
<td>Mbungu to Mikocheni T/L</td>
<td>Ilala to FZ III T/L</td>
<td>Responsible body</td>
<td>Tentative Cost USD</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>-------------------------</td>
<td>--------------------</td>
<td>-------------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>9 Aircraft path</td>
<td>Provision of red balloons signs hanging on conductors</td>
<td></td>
<td></td>
<td></td>
<td>Authorities. Communities and Religious leaders</td>
<td>NIL</td>
</tr>
<tr>
<td>10 Materials and equipment used for construction</td>
<td>Transformer oils should be free from PCB’s</td>
<td>C, OP</td>
<td>C, OP</td>
<td>C, OP</td>
<td>Contractor / TANESCO</td>
<td>Embedded in Construction costs</td>
</tr>
<tr>
<td></td>
<td>All litter from the construction materials like pieces of metals, broken conductors, etc. should be collected and put in safe place or disposed in environmentally friendly way.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Natural Hazards</td>
<td>The structural design of both civil and electrical works should take into account seismicity characteristics of the region.</td>
<td>D, C, OP</td>
<td></td>
<td></td>
<td>Consultant / Contractor / TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td></td>
<td>The final design of conductors should take into consideration all factors affecting the radio interference such as operating voltage, tower geometry, conductor size, number of conductors in a bundle, atmospheric conditions etc. and must be within the general acceptable level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Agriculture</td>
<td>Notification to be provided prior to the starting of construction works to enable farmers to harvest or alternatively adjust planting in the Right of Way</td>
<td></td>
<td></td>
<td></td>
<td>Contractor / TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>14 Demobilization of camps and construction sites</td>
<td>Rehabilitation by reforestations of fast growing trees species that can even grow under infertile soil conditions should be planted to the quarries and campsites immediately after demobilization.</td>
<td>C, OP</td>
<td>C, OP</td>
<td>C, OP</td>
<td>Contractor / TANESCO</td>
<td>5,000</td>
</tr>
<tr>
<td></td>
<td>Do a landscaping of the site and remove all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact</td>
<td>Mitigation measure</td>
<td>Moshi to Arusha T/L</td>
<td>Ubungo to Mikocheni T/L</td>
<td>Itala to FZ III T/L</td>
<td>Responsible body</td>
<td>Tentative Cost USD</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>-------------------------</td>
<td>---------------------</td>
<td>------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>15 Physical loss - Loss of house, land, plot, crops</td>
<td>➢ Compensate for the loss: lost house for money or house, lost plot with money or land.</td>
<td></td>
<td></td>
<td></td>
<td>TANESCO, Regional and District Authorities, Chief Valuer</td>
<td>Way leave acquisition costs (RAP)</td>
</tr>
<tr>
<td>17 Sociological loss - loss of neighbours, etc.</td>
<td>➢ Resettle people from same area in one area/resettle people where there are some people living there. Hold meetings to create friendly environment among the community members.</td>
<td></td>
<td></td>
<td></td>
<td>TANESCO, Regional and District Authorities, Chief Valuer</td>
<td>Way leave acquisition costs</td>
</tr>
<tr>
<td>18 Loss of social services like schools, health facilities etc.</td>
<td>➢ Construct social services like school water supply, health centres, dispensaries, shops, roads, markets, public transport, churches, mosques, etc.</td>
<td></td>
<td></td>
<td></td>
<td>TANESCO, Regional and District Authorities, Chief Valuer</td>
<td>Way leave acquisition costs</td>
</tr>
<tr>
<td>19 Psychological loss</td>
<td>➢ Pay disturbance allowances to all the affected</td>
<td>D, C</td>
<td>D, C</td>
<td>D, C</td>
<td>TANESCO, Regional and District Authorities, Chief Valuer</td>
<td>Way leave acquisition costs (RAP)</td>
</tr>
</tbody>
</table>
| 20 Transmission of HIV/AIDS between constructing workers and community | ➢ Awareness raising and education on HIV/AIDS among the workers and the affected community  
➢ Provision of protective gears (condoms) | C                                  | C                      | C                    | TANESCO, Contractor, Consultant                    | 5,000 |
| 21 Local people                            | ➢ Employment to youths in the affected                                            | C                                  | D                      | C                    | TANESCO, Consultant                                    | Construction |
## Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation measure</th>
<th>Moshi to Arusha T/L</th>
<th>Ubungo to Mikocheni T/L</th>
<th>Ilia to FZ III T/L</th>
<th>Responsible body</th>
<th>Tentative Cost USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 Impact of the land use on the Right of Way</td>
<td>➢ Inform the community of the right uses of the right of way including plants that are not allowed to be grown on the right of way</td>
<td>D, C, OP</td>
<td>D, C, OP</td>
<td>D, C, OP</td>
<td>Contractor/Consultant Ant / TANESCO</td>
<td>NIL</td>
</tr>
</tbody>
</table>
| 23 Population increase                                                 | ➢ Information dissemination to reduce employment expectation of the local workforce outside the project area  
➢ When hiring local workforce give priority to the affected communities | C                     | C                       | C                 | Contractor/Consultant Ant / TANESCO                  | NIL               |
| 24 Loss of security                                                    | ➢ Control the number of new comers who are jobless  
➢ Improve security measures                                            | C, OP                 | C, OP                   | C, OP             | Contractor/Consultant Ant / TANESCO                  | 1,000             |
| 25 Interference with graves, cemetery and cultural sites              | ➢ Avoid them by altering the route or pylon sitting  
➢ Request authorization from relatives, religious leaders and proponent to bear the moving costs | D, C, OP             | D, C, OP                | D, C, OP          | Contractor/Consultant Ant / TANESCO                  | NIL               |
| 26 Impacts of electromagnetic waves on human health                   | ➢ Adherence to the recommendation by TANESCO relative to the distances for setting up the residential houses  
➢ Sensitize the population about the potential health risk of setting up residences under the high voltage line or RoW  
➢ Restrict people to build under the line or within the safety zone | D, C, OP             | D, C, OP                | D, C, OP          | Contractor/Consultant Ant / TANESCO                  | NIL               |

**TOTAL TENTATIVE MITIGATION COST** 32,000

**Take note:**
For the all mitigation measures, which have NIL cost, cost will be incurred during construction (to be included in the bill of quantities) and monitoring period (refers to monitoring plan)

D - Design Phase  C - Construction Phase  OP - Operation and Maintenance Phase
Mitigation implementation monitoring
Some of the mitigation measures normally become an integral part of the project itself, incorporated into its design and into its plan of implementation. The implementation of the measures that have become an integral part of the project itself should be monitored also independently to ensure that the actual mitigation measures are actually implemented.

8.2 Issues addressed in Monitoring Plan
The proposed Monitoring Plan (Table 8.2) addresses environmental and social issues. It categorizes the issues in pre-construction, construction, decommissioning and operation phases. The time frame is also given.

Monitoring is expected to embrace measurements, observations, evaluation, assessment and reporting on the predetermined variables (indicators) during the construction and operation and maintenance phases of the project. Since this project belongs to TANESCO and the Government of Tanzania, it is anticipated that they will be mainly responsible for monitoring the whole project. TANESCO will have the responsibility of selecting the suitable and capable body to monitor the environmental variables whenever that expertise is needed.

8.2.1 Pre construction phase
The base line condition of the existing Right of Way and identification of any distinguished features has been done during this phase. The Socio economic data has also been collected from the people affected by the project in the resettlement areas.

8.2.2 Construction and decommissioning phases
During this phase the following items should be monitored: -

- Pollution (water, air and soil)
- Wastes (dredged materials, demolished materials, wastes equipment, quantity and destination)
- Land and soil erosion
- Disturbances to biophysical environment
- Disturbances to local residents
- Archaeological, Cultural or historical heritage
- Safety (Traffic, Electrocuton and general safety procedures during construction)
- Health and HIV / AIDS for workers and community
- Compliance with legislation, regulations, conventions and policies
- Socio economic impacts (impact on land – use in Right of Way)
- Ecological impacts (flora on the Right of Way)
• External development (changes in legislation / regulations relevant to the project, new monitoring techniques), and
• Resettlement of affected communities

8.2.3 Operations Phase
• Ecological impacts (flora and avifauna on the Right of Way)
• Disturbances to biophysical environment
• Safety – Electrocution and Towers safety
• Socio economic impacts (impact on land – use in right of way)
• Changes of policy, legislation and regulations on environmental issues and others relevant to the project
• Resettled communities.

8.3 Time Frame
The time frame for the monitoring will be divided into construction phase, operation phase and decommissioning phase. During construction phase monitoring will begin immediately after construction activities have commenced and monitoring should run throughout the construction phase and just after construction is over to ensure compliance of the recommended mitigation measures.

Monitoring during operation phase will start as soon as the electric power line is energized. TANESCO should prepare and incorporate this monitoring plan into TANESCO Procedure and Safety Manuals as standard operating practice.

Monitoring during decommissioning phase will be done when decommissioning activities starts.

8.4 Responsibilities for Monitoring
TANESCO as a project client will be responsible for the implementation of monitoring plan in all phases of project and shall ensure that consultants and contractors are playing their roles as required. TANESCO will prepare reports, evaluating data gathered from contractors, consultants and other parties involved in project.

Reports will be submitted to GOT (Ministry of Energy), Vice President Office Directorate of Environment, NEMC and World Bank.

8.5 Environmental training and education programme
For effective implementation of Environmental Management Plan (EMP), knowledge on environmental management and monitoring is very important. The level of knowledge required will differ depending on the role each one plays in implementing the EMP. Some will need awareness raising training while some will need a full
training on specific areas of environmental knowledge so that they provide and utilize the knowledge to execute the duties on environmental management. TANESCO staffs, Contractor’s staffs, monitoring institutions staffs and the public all need a certain type of environmental knowledge.

It is therefore proposed that seminars, workshop and short courses on specialised topics on environmental management, protection and compliance should be provided to top, senior management and environmental experts from TANESCO head and regional offices, selected officers from districts and Municipals, Ministry of Energy and Ministry of Environment in the Vice President’s Office through NEMC. In house short courses on environment and compliance should also be organized for transmission gangs to make sure that they follow all the environmental protection and management guidelines and compliance during their daily activities.

Contractor and TANESCO should ensure that training on health, safety and environment is conducted before the workers are allowed to move to the site. This record should be kept by contractor’s health, safety and environment representative.
### Table 8.2: Environmental and Social Monitoring Plan

<table>
<thead>
<tr>
<th>S/N</th>
<th>Impact</th>
<th>Monitoring Action</th>
<th>Typical Monitoring Frequency</th>
<th>Monitoring Location</th>
<th>Responsible Body</th>
<th>Tentative Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td><strong>Construction Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1.1 | Pollution (water, air and soil) Dust generation, Water and soil contamination, and sedimentation | - Monitor the effectiveness of Mitigation measures employed during construction  
- Monitor complains about pollution from dust, oil and fuel  
- Monitor storage and handling of fuel and lubricants | Daily during construction | Transmission line – corridor and on Sub station, camp sites and storage sites | Contractor / TANESCO                  | NIL.               |
| 1.2 | **Watercourse Crossing**                                               | - Monitor stream flow at watercourse crossing  
- Monitor the river bank erosion to the crossing  
- Monitor the vegetation clearance to the crossing  
- Monitor the water quality | Daily when the construction gang crossing the river, Then Monthly | Transmission line – corridor | Contractor, Consultant and TANESCO                  | NIL.               |
| 1.3 | Wastes (dredged materials, demolished materials, wastes equipment, quantity and destination) | - Monitor the removal of waste (refuse) and disposal to the designated area | Weekly | Transmission line – corridor and on Sub station area | Contracto, Consultant and TANESCO                  | NIL.               |
| 1.4 | **Land and soil erosion**                                              | - Monitor activities which will increase the effect of soil erosion and monitor mitigation plan | Daily during construction | Transmission line corridor and access roads | Consultant Contractor and TANESCO                  | NIL.               |
| 1.5 | **Disturbances to biophysical environment**                            | - Monitor activities which will increase the effect and  
- Monitor the implementation of mitigation plans | Daily during construction | Transmission line – corridor and on Sub station area | Consultant Contractor and TANESCO                  | NIL.               |
<p>| 1.6 | Ecological impacts (flora and fauna on the right of way)               | - Monitor activities sensitive to flora and fauna that could impact on | Daily during construction | Transmission line – corridor | Consultant Contractor and TANESCO                  | NIL.               |</p>
<table>
<thead>
<tr>
<th>S/N</th>
<th>Impact</th>
<th>Monitoring Action</th>
<th>Typical Monitoring Frequency</th>
<th>Monitoring Location</th>
<th>Responsible Body</th>
<th>Tentative Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7</td>
<td>Archaeological, Cultural or historical heritage</td>
<td>- Monitor that archaeological, shrine cultural and historical sites are not spoiled.</td>
<td>Daily during construction</td>
<td>Transmission line - corridor</td>
<td>Consultant Contractor and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>1.8</td>
<td>Social - economic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.8.1</td>
<td>Employment Jobs to the local community</td>
<td>- Monitor the job availability and number of local people employed by the project</td>
<td>Daily during construction</td>
<td>Villages on Transmission line corridor</td>
<td>Contractor TANESCO</td>
<td>1,000</td>
</tr>
</tbody>
</table>
| 1.8.2 | Safety (Traffic, Electrocution and general safety procedures during construction) | - Monitor the implementation of safety measures  
- Monitor the number of accidents occurring daily. | Daily                          | Working sites                | Consultant TANESCO                    | 2,000             |
| 1.8.3 | Training and education                   | - Monitor level of awareness  
- Monitor training records  
- Monitor job instruction manuals and work procedures. | weekly                         | Working sites and offices     | Consultant Contractor TANESCO         | 5,000             |
| 1.8.4 | Health and HIV / AIDS for workers and community | - Monitor implementation of mitigation plans  
- Monitor prevention campaigns  
- Monitor distribution of protective condoms. | weekly                         | Working sites and neighbour communities | Consultant Contractor TANESCO         | 5,000             |
| 1.8.5 | Impact on land – use in right of way     | - Monitor the implementation of resettlement action plan                          | weekly                       | Affected communities in the RoW       | NEMC TANESCO MLHSD                    | RAP package       |
| 1.9 | Compliance with legislation, regulations, conventions and policies: Local, International and Donors. | - Monitor the compliance to all relevant Government permit and National and International legislations and World Bank Policies and standards  
- Monitor the flow of information (communication) and reporting regarding the Safety Health and | Quarterly                     | Transmission line - corridor and on Substations | NEMC / TANESCO                      | 15,000            |
<table>
<thead>
<tr>
<th>S/N</th>
<th>Impact</th>
<th>Monitoring Action</th>
<th>Typical Monitoring Frequency</th>
<th>Monitoring Location</th>
<th>Responsible Body</th>
<th>Tentative Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Environment (SHE) and other standard performances to all relevant Government ministries, institutions and the World Bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.10</td>
<td>External development (i.e. changes in legislation / regulations relevant to the project, new monitoring techniques, and resettled communities)</td>
<td>- Monitor any changes in legislations and regulations relevant to the project and ensure their application</td>
<td>Continuously</td>
<td>Transmission line corridor, Substations, official gazette</td>
<td>Consultant Contractor and TANESCO</td>
<td>NIL</td>
</tr>
<tr>
<td>2.0</td>
<td>Operation phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Pollution (water, air and soil) - Storage and handling of fuel and lubricants</td>
<td>- Monitor oil and lubricants spillages</td>
<td>Yearly</td>
<td>Substations</td>
<td>TANESCO / NEMC</td>
<td>4,000</td>
</tr>
<tr>
<td>2.2</td>
<td>Solid Wastes – Hazardous materials (broken insulators), burning of waste (pollution) and surface water pollution from unsafe disposal</td>
<td>- Monitor all solid waste disposal from all facilities</td>
<td>Monthly and yearly during operation</td>
<td>Substations – control rooms and substations yards</td>
<td>TANESCO – Regional offices</td>
<td>Regional office budget and as item 2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Monitor disposal technique to ensure appropriate disposal</td>
<td></td>
<td></td>
<td>TANESCO HQ NEMC</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Flora and Fauna</td>
<td>- Monitor incidents of bush fire, reforestation exercise,</td>
<td>Quarterly</td>
<td>Transmission line corridor</td>
<td>Districts TANESCO / NEMC</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Monitor farming practices and animal grazing in the RoW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>Socio – economic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4.1</td>
<td>Socio economic impact on resettled local communities</td>
<td>- Monitor their social economic situation after resettlement</td>
<td>Yearly</td>
<td>New resettlement areas</td>
<td>NEMC TANESCO</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Monitor adequacy of social facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4.2</td>
<td>Health of workers</td>
<td>- Monitor frequency of illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S/N</td>
<td>Impact</td>
<td>Monitoring Action</td>
<td>Typical Monitoring Frequency</td>
<td>Monitoring Location</td>
<td>Responsible Body</td>
<td>Tentative Cost US$</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>------------------------------</td>
<td>--------------------------------------</td>
<td>-----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor provision of health facilities</td>
<td>Monthly</td>
<td>Work sites and substations</td>
<td>Consultant TANESCO</td>
<td>5,000</td>
</tr>
<tr>
<td>2.4.3</td>
<td>Sexually transmitted diseases, HIV/AIDS and other diseases</td>
<td>Monitor number of new infections, Monitor preventive measures in place</td>
<td>Monthly</td>
<td>Work place</td>
<td>Consultant TANESCO</td>
<td>1,000</td>
</tr>
<tr>
<td>2.4.4</td>
<td>Education and training</td>
<td>Monitor training records, Monitor level of awareness</td>
<td>Yearly</td>
<td>workplace</td>
<td>TANESCO</td>
<td>15,000</td>
</tr>
<tr>
<td>2.5</td>
<td>Compliance with Laws, Regulations, Conventions, policies and standards – local and International (WB)</td>
<td>Monitor the compliance to all relevant Government permits, National or International legislations and guideline requirements. Monitor information flow and reporting to all relevant government ministries and WB. Monitor compliance parameters regarding Safety, Health and Environment (SHE)</td>
<td>Biannually</td>
<td>Substation and project site</td>
<td>NEMC TANESCO</td>
<td>5,000</td>
</tr>
</tbody>
</table>

**Table 8.3: Further Socio-economic Mitigation Monitoring Plan**

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Phase Cons./ Op.</th>
<th>Mitigation</th>
<th>Monitoring Indicators.</th>
<th>Monitoring Frequency</th>
<th>Follow-up and methodology</th>
<th>Responsible body</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physical loss-</td>
<td>Cons</td>
<td>Compensation- money/house, plot/land.</td>
<td>All families have a house and are settled, have plot, have land and are farming</td>
<td>During RoW acquisition in the</td>
<td>TANESCO and Identified consultants NEMC and</td>
</tr>
<tr>
<td></td>
<td>Loss of house, land, plot, crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Phase</th>
<th>Mitigation</th>
<th>Monitoring Indicators</th>
<th>Monitori ng Frequency</th>
<th>Follow-up and methodology</th>
<th>Responsible body</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Government authorities</td>
</tr>
<tr>
<td>2. Financial Loss</td>
<td>Cons</td>
<td>Compensate business houses, money for business</td>
<td>People resume their businesses/have tenants</td>
<td>During RoW acquisition in the project area</td>
<td>Meetings with the affected and visits to business areas.</td>
<td>-do-</td>
</tr>
<tr>
<td>Loss of business and tenants.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-do-</td>
</tr>
<tr>
<td>3. Sociological loss</td>
<td>Cons</td>
<td>Resettle people from same area in one area/resettle people where there are some people living there. Hold meetings to create friendly environment among the community members.</td>
<td>People are settled happily together/ formed new friends and neighbours</td>
<td>During RoW acquisition in the project area</td>
<td>Meetings to find out problems in coping with new environments</td>
<td>-do-</td>
</tr>
<tr>
<td>loss of neighbours,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-do-</td>
</tr>
<tr>
<td>4. Loss of social services like schools, health facilities etc.</td>
<td>Cons</td>
<td>Construct social services like school water supply, health centres, dispensaries, shops, roads, markets, public transport, churches, mosques, etc.</td>
<td>Schools, water supply, roads, transport, hospitals, etc. available and in use.</td>
<td>During RoW acquisition in the project area</td>
<td>Visits to these facilities. Meetings with the affected communities to find out if there are any complaints.</td>
<td>-do-</td>
</tr>
<tr>
<td>5. Psychological loss</td>
<td>Cons</td>
<td>Pay disturbance allowances to all the affected</td>
<td>Each affected person is paid his/her allowances. The affected are getting over the shock of the situation</td>
<td>During RoW acquisition in the project area</td>
<td>Holding meetings with the affected from time to time to reassure them of their future</td>
<td>-do-</td>
</tr>
<tr>
<td>6. Transmission of HIV/AIDS between constructing workers and community</td>
<td>Cons and Op</td>
<td>Awareness raising and education on HIV/AIDS among the workers and the affected community Providence of protective gears (condoms)</td>
<td>Number of awareness raising meetings conducted Number of awareness materials distributed, Amount of protective gears/condoms distributed.</td>
<td>Monthly during the construction in the project areas</td>
<td>Checking the contract on the HIV/AIDS. To ensure that the contract is being undertaken properly Meeting with community to find out their understanding of HIV/AIDS.</td>
<td>TANESCO contractor, consultant NEMC</td>
</tr>
<tr>
<td>7. Impact of the land use on the Right of</td>
<td>Op.</td>
<td>Inform the community of the right uses of the right of way including</td>
<td>Activities and use of the right of way</td>
<td></td>
<td>Regular inspection or audit of right of way</td>
<td>TANESCO</td>
</tr>
<tr>
<td>Impacts</td>
<td>Phase</td>
<td>Mitigation</td>
<td>Monitoring Indicators</td>
<td>Monitoring Frequency</td>
<td>Follow-up and methodology</td>
<td>Responsible body</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>---------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
</tbody>
</table>
| Impact 8: Population increase       | Cons  | ➢ Information dissemination to reduce employment expectation of the local workforce outside the project area  
➢ When hiring local workforce give priority to the affected communities | ➢ Monitor immigration occurring in the project area communities                        |                      | ➢ Follow-up data from the Local authorities offices | TANESCO Contractor Local authorities    |
| Impact 9: Loss of security          | Cons. | ➢ Control the number of new comers who are jobless  
➢ Improve security measures          | ➢ Monitor the number of law breaking incidences (thefts, killing, fights, etc.)          |                      | ➢ Follow-up data from the local authorities offices and police stations | Local authorities, TANESCO, Contractors Police |
| Impact 10: Interference with graves, cemetery and cultural sites | Cons  | ➢ Avoid them by altering the route or pylon sitting  
➢ Request authorization from relatives, religious leaders and proponent to bear the moving costs | ➢ Monitor that no grievances have been lodged  
➢ Monitor the process of exhumation and rebural or ensure compensation is paid |                      | ➢ Follow-up complaints  
➢ Public meeting                               | TANESCO, Local and religious leaders, relatives                                 |
| Impact 11: Impacts of electromagnetic waves on human health | Op    | ➢ Adherence to the recommendation by TANESCO relative to the distances for setting up the residential houses  
➢ Sensitize the population about the potential health risk of setting up residences under the high voltage line or RoW  
➢ Restrict people to build under the line or within the safety zone | ➢ Ensure that no residences are being set up under the transmission line or within the right of way  
➢ Monitor the level of awareness of people in the project area about the potential health risks if built a house under the line |                      | ➢ Regular inspection of the transmission line corridor  
➢ Public meetings                                | TANESCO NEMC                                                         |

The monitoring costs will be determined by the number of monitors to be involved and the contractor’s (consultants) package.
Cons. – Construction Phase
Op. – Operation Phase
CHAPTER 9

CONCLUSION AND RECOMMENDATIONS

9.1 Key findings
From this impact assessment the following are the key findings for all three transmission lines (Moshi – Arusha, Ubungo – Mikocheni and Ilala – FZ III):

➢ The impact on biophysical environment is minimal and the impacts can be mitigated

➢ The impact on social environment is high since some people will have to be resettled, which means loss of shelter, loss of business places, loss of family proximity, long travel or walk to social facilities such as schools, markets, hospital, and to offices

➢ For Moshi – Arusha T/L majority of those to be affected by the project will have to let their land used for that TL however they will be allowed to continue planting short and perennial crops such as beans, maize ground nuts, paddy etc. in the RoW. Very few houses will be affected in this line.

➢ Majority of people in Moshi-Arusha route requested TANESCO to continue using the acquired land to grow short and seasonal crops such as beans, maize, sunflower, paddy, etc.

➢ For Ubungo – Mikocheni and Ilala – FZ III majority of people will loose their houses and business places if a way leave corridors of 40m or 15m will be used

➢ The Ubungo – Mikocheni and Ilala Kurasini routes had majority of people resisting the relocation and they are insisting that the project should use the road reserve and the underground cable

➢ Majority of people to be affected are annoyed and angry over the whole idea of being dislocated but also agree that availability of reliable electricity is good for the country’s development and for theirs. But the problem is who should volunteer to allow the transmission line passage in exchange with financial compensation

➢ All people to be affected are concerned about their fate after relocation particularly on the availability of the social services in the new places they will be relocated and whether the compensation will be fair and prompt
Majority of people are worried over the loss of their businesses and other income generating activities on top of psychological and sociological losses that cannot be compensated.

There was a diverse opinion regarding houses and plots compensation. Some wanted to be compensated with money, others wanted to be given another plots while some wanted to be given a house to house.

People want transparent valuation process, fair and prompt compensation. They do not like compensation delays as happened to Airport expansion Project at Kipawa and Kiwalani area.

It is the wish of majority that project should relocate as minimum people as possible either using modern technologies such as underground cable in spite of high construction costs or re-routing the transmission line away from their areas since the social impact is so huge to them even if they are compensated.

9.2 Conclusion

This Environmental and Socio - Economic Impact Assessment report presents the analysis and results of the proposed 132kV electric power transmission lines; from Moshi (Kiyungi substation) to Arusha (Njiri substation); Ubungo substation to New Oysterbay substation; and from Iitala substation to Factory Zone III via Kurasini, Mbagala, and Yombo substations. The results of the study have shown the following:

For Moshi – Arusha line, the project activities from planning, design, construction up to operation stage will have minimum negative impact to the biophysical and social - economic environment provided that mitigation measures proposed in this report are implemented. Further to social environment, it has to be ensured that underground cable, compact design, Double circuit to the existing line or shifting the line to accommodate the new line on the existing way leave are considered for the stretch of 1.5 km as you come into Njriro substation in Arusha municipal to reduce social impact (resettlement of people) and reduce the compensation costs.

For Ubungo – New Oysterbay Substation the impact on the biophysical environment is minimal. However the impact on community would have been high if TANESCO had not considered using the combination of underground cable and compact design on the road reserve. Since TANESCO has decided to utilize as far as possible the underground cable on the road reserve, then the social impact will be very minimal. As long as mitigation measures are implemented and the plan to use underground cable in the road reserve is implemented then the project is viable from environmental and social point of view.

For Iitala – Factory Zone III substation via Kurasini, Mbagala and Yombo, the impact in biophysical environment is also expected to be minimal. According to TANESCO new
plan following the public consultations, as the case with Ubungo – New Oysterbay T/L, the Ilala – FZ III T/L will be a combination of underground cable in areas with densely population and compact design on sparsely populated areas. Therefore it is anticipated that as long as the mitigation measures are implemented and the recommended design by TANESCO is implemented even the social impacts are expected to be low. Hence the project is potentially viable from environmental and social point of view.

9.3 Recommendations
The team would like to recommend the following measures in this environmental and social impact assessment report.

- Contents of this EIA report should be incorporated in the project cycle including design stage and other subsequent project undertakings to ensure that the project is technically, environmentally and socially sustainable and that all concerns raised during consultative meetings are addressed during the implementation of the project.

- TANESCO should implement the EMP quite seriously even after the construction activities have been completed

- Environmental protection is the obligation of everyone including the contractors and subcontractors of this project. Hence, a clause showing obligation of the contractor regarding environmental protection should be incorporated in the Contract Document. Under the clause it should be stipulated clearly that it is a contractual duty for the consultant, contractor and client to take due cognisance of the environmental concerns as stipulated in this ESIA report. Therefore, senior supervisors from client, consultant and contractor should be appointed and assigned responsibilities to oversee the implementation of the mitigation measures.

- The issue of compensation is very sensitive, hence it should be done as soon as valuation of property is complete. The process should be transparent and involving the real affected people to ensure fairness and fewer grievances.

- After the valuation of properties is complete, the affected people should be informed of the value of their properties (amount of money each one has to be paid as compensation) before payment is processed so as to eliminate/reduce the possibility of being paid less than what each ought or expects to be paid.

- Wherever possible underground cable on road reserve should be used in all resettled areas as a primary option, otherwise use the compact design so as to shift (relocate) as few people as possible to reduce the anticipated social impacts and at the same time reduce the compensation costs.
- Affected people should be involved in every stage of the project and TANESCO should provide feedback information promptly to the raised concerns or issues.

- Whenever there are job vacancies in the project area TANESCO and the Contractor should provide those skilled and unskilled jobs to the affected people in the first place during construction and operation phases.

- TANESCO should establish a mechanism to deal with complaints and grievances of affected people and to provide correct information (information dissemination).

- TANESCO should deal with people who are still living under the transmission line and within the Right of Way of the existing Moshi (Kiyungi) – Arusha (Njaro) transmission line for the safety of the people and the smooth operation of the line.

- TANESCO should consider supplying electricity to the villages such as Samaria, Kikwe, etc., which are among the affected villages in Moshi – Arusha T/L so that villagers see the value of electricity development and to instil the ownership of the project.

- During construction the project should consider improving road infrastructure in the villages that are affected by the project as part of the access road improvement and or as part of project contribution to village development. Otherwise the project should consider improving health facilities in the project area whereby they will serve both project workers and the villagers.
REFERENCES


4. TANESCO LTD, (2001). Study for Electrification of Various Farms and Villages in West Kilimanjaro, Moshi


7. NEMC (1997), draft EIA guidelines and procedures.


17. United Republic of Tanzania, 2002 Population and Housing Census


The Study Teams

1. Bio-Physical Environmental Assessment

   John Lazimah  Environmental Unit TANESCO
   Mansur Hamduni  Environmental Unit TANESCO

2. Geological investigations

   Leonard Kassana  Geology section TANESCO

3. Social Impact Assessment

   NyinisaI Palangyo  Independent Consultant (Sociologist)

4. Resettlement Action Plan (RAP)

   David Hayward  Consultant (Impacto Consulting Firm)
PHOTO DOCUMENTATION
CONSULTATION WITH AFFECTED PEOPLE THROUGH PUBLIC MEETINGS

Photo 1: Consultative meeting with Sinza C residents for the Ubungo – Mikocheni 132kV T/L

Photo 2: A Mlalakuwa Savei area resident giving her views regarding the proposed project of 132kV transmission line (Ubungo – New Oyster bay Substation – Mikocheni) crossing their area.

Photo 3: A portion of Mbagala Kuu residents who attended the consultative meeting for the Kurasini – Mbagala 132kV transmission line are listening to the project sensitization team leader.
Photo 4: A section of Kurasini Mivinjeni people who attended a consultative meeting for the proposed 132kV line between IlaIa and Kurasini is listing to their fellow resident giving his views about the project. He is insisting about fair and open compensation during the resettlement plan implementation.

Photo 5: Opening a consultative meeting of Bonde la Mpunga area residents in Msasani Ward where it is proposed to construct a 132kV underground cable. The proposed line from Ubungo to New Oyster bay S/S passes in the area.

Photo 6: Residents of Kurasini Minazini are listening attentively to the remarks made by consultative meeting team leader regarding the resettlement plan if the project is implemented.
Photo 7: Consulting women at Sanya Station whom the proposed new 132kV T/L (Kiyungi Njiro) project is going to relocate them if it is implemented.

Photo 8: An old man earring his feelings regarding a relocation in a consultative meeting with Rangi Tatu residents in Mbagea Charambwe Ward.

Photo 9: A NEMC's Technical Review Committee member from the UDSM - IRA clarifying some land acquisition issues with Njiro Engutoto Ward during consultative meeting for 132kV T/L project. She referred to the example of Songo-Songo Gas Pipeline project which was also a WB funded project.
Photo No. 1 Vegetation cover across the existing 132kV line from Kiyungi S/S (Moshi) to Njiro S/S (Arusha) Transmission Line (River vegetation)
Photo No. 2  Existing environmental degradation in the existing 132kV line from Kiyungi S/S to Njro S/S
Photo No. 3 Environmental degradation and cultivation under the existing 132kV from Kiyungi (Moshi) to Njiro (Arusha) Transmission power line
Photo No 4 Type of houses existing in the vicinity of existing 132kV Transmission power line from Kiyungi S/S to Njirro S/S
Photo No. 5 Types of vegetation, houses and some of activities undertaken on the proposed Ubungo S/S to New Oysterbay S/S 132kV Transmission Power line (Red arrows shows part of area where underground cable will be laid.)
Photo No.6 Typical Vegetation cover, Houses and Infrastructures existing in the proposed 132kV Transmission line from Ilaa S/S to factory Zone III via Kurasini, Mbagala Substations and Proposed Yombo S/S
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Components</th>
<th>Impact</th>
<th>Construction</th>
<th>Operation and Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Atmosphere/Air Climate</td>
<td>Atmospheric pollution (dust)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Green house emissions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Fumes</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Land</td>
<td>Ground vibrations</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Land requirement</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Land and soil degradation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Soil erosion</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Water Resources</td>
<td>Ground water quality</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Storm water drainage</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Surface water quality</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ecological Resources</td>
<td>Vegetation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Wildlife</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Wetland ecosystems</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Fisheries</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Birds</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Electrocution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Biodiversity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Aesthetic and Cultural Environment</td>
<td>Aesthetic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Cultural / Archeological sites</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Landscape</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Recreation or tourists sites</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Public Health and Safety</td>
<td>Accidents</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Electrocution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Diseases</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Health service improvements</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Sanitation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Poisoning</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Socio-Economic</td>
<td>Agriculture (crop production)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Relocation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Demography</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Parameters</td>
<td>Components</td>
<td>Impact</td>
<td>Construction</td>
<td>Operation and Maintenance</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td>--------</td>
<td>--------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Employment and income</td>
<td>✓</td>
<td></td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Activities diversification</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Settlements</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Industrial development</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Institutional setup</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Lifestyle and quality of life</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Tourism</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Trade</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Urbanization</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Water supply</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Communication</td>
<td>Radio waves interference</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Communication improvement</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Radiation from power line</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Hazard to airplanes</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

**KEY:**

Depending upon the experts' valuation and judgement the checklist applies scores of environmental impacts ranging from 0 to ±3.

Where 0 means no impact, which is reversible or irreversible.

±1 minor impact restricted to the local area.

±2 moderate impact confined to the project region and.

±3 indicate high impact of national or international significance.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Components</th>
<th>Impact</th>
<th>Construction</th>
<th>Operation and Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Atmosphere/Air/Climate</td>
<td>Atmospheric pollution (dust)</td>
<td>✓</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>Green house emissions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Fumes</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Land</td>
<td>Ground vibrations</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Land requirement</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Land and soil degradation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Soil erosion</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Soil pollution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Water Resources</td>
<td>Ground water quality</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Storm water drainage</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Surface water quality</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ecological Resources</td>
<td>Vegetation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Wildlife</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Wetland ecosystems</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Fisheries</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Birds</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Electrocution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Biodiversity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Aesthetic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Aesthetic and Cultural Environment</td>
<td>Cultural / Archeological sites</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Landscape</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Recreation or tourists sites</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Public Health and Safety</td>
<td>Accidents</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Electrocution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Diseases</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Health service improvements</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Sanitation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Poisoning</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Socio-Economic</td>
<td>Agriculture (crop production)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Relocation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Parameters</td>
<td>Components</td>
<td>Impact</td>
<td>Construction</td>
<td>Operation and Maintenance</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>--------</td>
<td>--------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>high</td>
<td>Low</td>
<td>-3</td>
</tr>
<tr>
<td>Demography</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment and income</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities diversification</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settlements</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional setup</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifestyle and quality of life</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourism</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urbanization</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water supply</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>Radio waves interference</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication improvement</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radiation from power line</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hazard to airplanes</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

**KEY:**
Depending upon the experts' valuation and judgement the checklist applies scores of environmental impacts ranging from 0 to ±3.

Where 0 means no impact, which is reversible or irreversible.

±1 minor impact restricted to the local area.

±2 moderate impact confined to the project region and.

±3 indicate high impact of national or international significance.
132 kV Compact Line
Single Circuit
Type B

Reinforcement and Upgrade of
Dar es Salaam, Kilimanjaro and Arusha
Transmission and Distribution System

LAHMeyer INTERNATIONAL
Consulting Engineers
2-11112 840 MILE
Specifications:

- **Description**
  - a: Lightning Protection Angle
  - b: Length of Upper and Middle Crossarm (3500)
  - c: Length of Bottom Crossarm
  - d: Vertical Clearance Phase to Ground (7000)
  - e: Vertical Clearance Phase to Phase (4200)
  - f: Distance Upper Crossarm to Tower Top (4350)
  - g: Maximum Wind Deflection Angle
  - h: Clearance Between Phase and Tower Parts

**132 kV Compact Line**
Single Circuit
Type C

Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System

Lahey International Consulting Engineers
CONSULTATION MEETING ATTENDANCE

SINZA A RESIDENTS - MEETING HELD ON 12th January 2005

LIST OF PARTICIPANTS

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Ownership</th>
<th>House No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Hadji Katima</td>
<td>Jamudu Katima</td>
<td>684</td>
</tr>
<tr>
<td>2.</td>
<td>Felista Njonanje</td>
<td>Felista Njonanje</td>
<td>683</td>
</tr>
<tr>
<td>3.</td>
<td>Catherine Taggi</td>
<td>Satu Taggi</td>
<td>340</td>
</tr>
<tr>
<td>4.</td>
<td>Neema Mwakiposa</td>
<td>M. Mwakiposa</td>
<td>895</td>
</tr>
<tr>
<td>5.</td>
<td>Mrs. Ngokoko</td>
<td>Mrs. Ngokoko</td>
<td>894</td>
</tr>
<tr>
<td>6.</td>
<td>Omari Juma</td>
<td>Omari Juma</td>
<td>331</td>
</tr>
<tr>
<td>7.</td>
<td>Pili Lutumbo</td>
<td>Lutumbo Muhondi</td>
<td>2A</td>
</tr>
<tr>
<td>8.</td>
<td>Fatuma Samizi</td>
<td>Fatuma samizi</td>
<td>4A</td>
</tr>
<tr>
<td>9.</td>
<td>Z. Habib</td>
<td>Habibu Hassan</td>
<td>685</td>
</tr>
<tr>
<td>10.</td>
<td>G. Katima</td>
<td>G. Katimas</td>
<td>293</td>
</tr>
<tr>
<td>11.</td>
<td>Vincent Mboya</td>
<td>Vincent Mboya</td>
<td>316</td>
</tr>
<tr>
<td>12.</td>
<td>Edward Nanyaro</td>
<td>Edward Nanyaro</td>
<td>318</td>
</tr>
<tr>
<td>13.</td>
<td>B. Lugoe</td>
<td>Salvatore Lugoe</td>
<td>336</td>
</tr>
<tr>
<td>14.</td>
<td>A. Segesela</td>
<td>A. Segesela</td>
<td>327</td>
</tr>
<tr>
<td>15.</td>
<td>F. Mapigano</td>
<td>D.P. Mapigano</td>
<td>682</td>
</tr>
<tr>
<td>16.</td>
<td>Tomo Mapigano</td>
<td>D.P. Mapigano</td>
<td>682</td>
</tr>
<tr>
<td>17.</td>
<td>Alex Peter</td>
<td>Peter Thomas</td>
<td>306</td>
</tr>
<tr>
<td>18.</td>
<td>J.A. Matego</td>
<td>J.A. Matego</td>
<td>1A</td>
</tr>
<tr>
<td>19.</td>
<td>Desdori Raphael</td>
<td>Jerome Magandula</td>
<td>-</td>
</tr>
<tr>
<td>20.</td>
<td>J.P. Mrema</td>
<td>J. P. Mrema</td>
<td>318</td>
</tr>
<tr>
<td>21.</td>
<td>J. Msaki</td>
<td>J. Msaki</td>
<td>-</td>
</tr>
<tr>
<td>22.</td>
<td>Rustis Mboya</td>
<td>Rustis Mboya</td>
<td>334</td>
</tr>
<tr>
<td>23.</td>
<td>Rornwold Kisma</td>
<td>R.J. Kisma</td>
<td>19</td>
</tr>
<tr>
<td>25.</td>
<td>Mohamed S. Kigungu</td>
<td>M.S. Kigungu</td>
<td>328</td>
</tr>
<tr>
<td>27.</td>
<td>Haji Boga</td>
<td>Haji Boga</td>
<td>330</td>
</tr>
<tr>
<td>28.</td>
<td>H. S. Rukinga</td>
<td>H. S. Rukinga</td>
<td>326</td>
</tr>
<tr>
<td>29.</td>
<td>Hussen Ally</td>
<td>P. Siwanga</td>
<td>308</td>
</tr>
<tr>
<td>30.</td>
<td>Vedistina Mutakyaahwa</td>
<td>Vedistina Mutakyaahwa</td>
<td>18</td>
</tr>
<tr>
<td>31.</td>
<td>Gerald Mkusa</td>
<td>Gerald Mkusa</td>
<td>8</td>
</tr>
<tr>
<td>32.</td>
<td>Mfwango O.</td>
<td>Mwakipesile O.L.</td>
<td>12</td>
</tr>
<tr>
<td>33.</td>
<td>Godfrey Masanja</td>
<td>H. Millima</td>
<td>332</td>
</tr>
<tr>
<td>34.</td>
<td>Deoroy Mitara</td>
<td>Deoroy Mitara</td>
<td>338</td>
</tr>
<tr>
<td>35.</td>
<td>Charle Matee</td>
<td>Eliabu Matee</td>
<td>312</td>
</tr>
<tr>
<td>36.</td>
<td>Lydia Ndoloki</td>
<td>F. Ndoloki</td>
<td>-</td>
</tr>
<tr>
<td>37.</td>
<td>Ashura Amani</td>
<td>Hamisi Matika</td>
<td>314</td>
</tr>
<tr>
<td>38.</td>
<td>Ahmad Kikula</td>
<td>Ahmad Kikula</td>
<td>848</td>
</tr>
<tr>
<td>39.</td>
<td>Reginald Minja</td>
<td>Reginald Minja</td>
<td>-</td>
</tr>
<tr>
<td>40.</td>
<td>Mwanaisha Clarde</td>
<td>Mwanaisha Clarde</td>
<td>14</td>
</tr>
<tr>
<td>41.</td>
<td>Magreth Kisima</td>
<td>Magreth Kisima</td>
<td>19</td>
</tr>
<tr>
<td>42.</td>
<td>Atu Maseli</td>
<td>Atu Maseli</td>
<td>16</td>
</tr>
<tr>
<td>43.</td>
<td>Emanuel Kaale</td>
<td>Emanuel Kaale</td>
<td>5</td>
</tr>
<tr>
<td>44.</td>
<td>Nyinisa Pallangyo</td>
<td>SIA -Consultant</td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>Susan Wagner</td>
<td>SIA -Consultant</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>John Lazimah</td>
<td>Engineer-TANESCO</td>
<td></td>
</tr>
</tbody>
</table>

LIST OF PARTICIPANTS SINZA C
MEETING HELD ON 12th January 2005

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Ownership</th>
<th>House No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REINFORCEMENT AND UPGRADE OF DAR ES SALAAM, KILIMANJARO AND ARUSA TRANSMISSION AND DISTRIBUTION SYSTEM PROJECT

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Paul Konyaki (VC)</td>
</tr>
<tr>
<td>2.</td>
<td>Athuman Kamhi (Member WDC)</td>
</tr>
<tr>
<td>3.</td>
<td>Mohamed Ngulangwa (Member WDC)</td>
</tr>
<tr>
<td>4.</td>
<td>Alexander Mabula (Member WDC)</td>
</tr>
<tr>
<td>5.</td>
<td>Mathias Kizwaga</td>
</tr>
<tr>
<td>6.</td>
<td>Octavian Mbangosongu</td>
</tr>
<tr>
<td>7.</td>
<td>Edmund Kinwasi</td>
</tr>
<tr>
<td>8.</td>
<td>Issa J. Ngimba</td>
</tr>
<tr>
<td>9.</td>
<td>Stephen T.T. Mushiri</td>
</tr>
<tr>
<td>10.</td>
<td>L. Kanyanga</td>
</tr>
<tr>
<td>11.</td>
<td>Mrs. A. Mbuye</td>
</tr>
<tr>
<td>12.</td>
<td>Osambo Mboi</td>
</tr>
<tr>
<td>13.</td>
<td>Nyinisa Pallangyo</td>
</tr>
<tr>
<td>14.</td>
<td>Susan Wagner</td>
</tr>
<tr>
<td>15.</td>
<td>John Lazzinah</td>
</tr>
</tbody>
</table>

YOMBO VITUKA RESIDENTS - MEETING HELD ON 15th January 2005

LIST OF PARTICIPANTS

1. Ally Ismail Hassan - Chairman Mtaa
2. Amina Simba - Secretary Mtaa
3. Ilwiniini Bazura Ndu - Member WDC
4. Athuman B. Ndaypz - Councilor
5. Kiwa Ninaliwo - WEO
6. Jairo Yohaness - Member WDC
7. Abdallah R. Gonge
8. Mwaulidi Kambi
9. Omari Nduumu
10. Shidi Gudi
11. Ally Makota
12. Said Bakari Nginyani
13. Shaban Bakari
14. Jumane Iidi Msago
15. Cleophance Kalekera
16. Salum S. Bukheria
17. Severn Bwana
18. Ally Shombo
19. Athuman Rashid Mwimbe
20. Jitukidmi Kazidi Pore
21. Mohamed Chiapi
22. Ramadhan Said Musa
23. Zaituni Seif Mansodo
24. Benton Mwandonbo
25. John Mchooni
26. Joseph Misana
27. Philek Ubiaki
28. Shani Mkungo
29. Gaitano Mtemekele
30. Edwin Azania Rice
31. Nasoro Sad
32. Msakuki Mwaruka
33. Said Kapenga
34. Allan S. Mlambe
35. A.N. Mpangalu
36. Said S. Mitunbo
37. Ally Halfan Serega
38. Mathew Kilapilo
39. Edna Massenga
40. Scola Oscar Kiboga
41. Lusie Ibrahim Ogido
42. Emelk Edward Nyamani
43. Sakaia Issa Amisi
44. Raima Peter Libana
45. Farusa Mohamed
46. Clara Pascal Massenga
47. Evelina Anatory
48. Maua Michdi Athuman
49. Fatuma Sultan
50. Azzana Hassan
51. Fatma Shomari Mngwindu
52. Asha Shaban
53. Evi Shani
54. Zainabu S. Ng'wando
55. Robert Kayange
56. Mwai Salote
57. Abdallah Rashid Mbweso
58. Shaban Idd Mluge
59. Hamisi P. Pole
60. Mariam Athuman Kinyago
61. Galus A Kauriano
62. Hamisi Kibuzi
63. Halima Ally Ramadhan
64. Asha Mshala Mkuunde
65. Lucas Kusloka
66. Thabit Bukite
67. Ramadhan Fuyu
68. Abiba Azimi
69. Asma Agnes Ngalu
70. Mwajuma Waziri Kipimo
71. Adam Salum Mwanyimkuu
72. Lucas Martin Mwangwiza
73. Salmir Athuman Mhara
74. Muhamad Ramadhan Kambi
75. Fatuma Omari Uta
76. Vesta Felbert Mwijago
77. Ramadhan Fuyu
78. Thabit Halid Bufula
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>79.</td>
<td>Lucas Kushoka</td>
</tr>
<tr>
<td>80.</td>
<td>Hadija Kasim Athuman</td>
</tr>
<tr>
<td>81.</td>
<td>Juma Mwiniyienga Mbegu</td>
</tr>
<tr>
<td>82.</td>
<td>Ramadhani Said Manshali</td>
</tr>
<tr>
<td>83.</td>
<td>Mawazo S. Manshallah</td>
</tr>
<tr>
<td>84.</td>
<td>Godfrey R. Mitalo</td>
</tr>
<tr>
<td>85.</td>
<td>Salum S. Mpingile</td>
</tr>
<tr>
<td>86.</td>
<td>Calman Godswin</td>
</tr>
<tr>
<td>87.</td>
<td>Shaban Ally Matanga</td>
</tr>
<tr>
<td>88.</td>
<td>Mmbwana Mwambo</td>
</tr>
<tr>
<td>89.</td>
<td>Iddi Mwinigyohe Gereza</td>
</tr>
<tr>
<td>90.</td>
<td>Shaban Mkongo</td>
</tr>
<tr>
<td>91.</td>
<td>Zuberi Kiwaluka</td>
</tr>
<tr>
<td>92.</td>
<td>Mintanga Rashid Manyama</td>
</tr>
<tr>
<td>93.</td>
<td>Siesa Mohamed Hunsia</td>
</tr>
<tr>
<td>94.</td>
<td>Juma S. Gimbi</td>
</tr>
<tr>
<td>95.</td>
<td>Iddi Mkunwa</td>
</tr>
<tr>
<td>96.</td>
<td>Hasma s. Kibuyu</td>
</tr>
<tr>
<td>97.</td>
<td>Abas Mohamed Kapema</td>
</tr>
<tr>
<td>98.</td>
<td>Mrs. Nkomaluka</td>
</tr>
<tr>
<td>99.</td>
<td>Mrs. Mwapaja</td>
</tr>
<tr>
<td>100.</td>
<td>Ahmed Juma Shemdeoe</td>
</tr>
<tr>
<td>101.</td>
<td>Thomas Ikelege Lyang'ombe</td>
</tr>
<tr>
<td>102.</td>
<td>Shaban Ramadhan Jiwa</td>
</tr>
<tr>
<td>103.</td>
<td>Mohamed Aman</td>
</tr>
<tr>
<td>104.</td>
<td>Stanslaus Ndahaze</td>
</tr>
<tr>
<td>105.</td>
<td>Frances Ruhendo</td>
</tr>
<tr>
<td>106.</td>
<td>Peter Onesmo Nyanda</td>
</tr>
<tr>
<td>107.</td>
<td>Mwiniyimba Simba Chansi</td>
</tr>
<tr>
<td>108.</td>
<td>Iddi Salum Iddi</td>
</tr>
<tr>
<td>109.</td>
<td>Rogart Pius Jacob</td>
</tr>
<tr>
<td>110.</td>
<td>Mulim All Mgoa</td>
</tr>
<tr>
<td>111.</td>
<td>Mohamed Omari Kitonge</td>
</tr>
<tr>
<td>112.</td>
<td>Pius O. Abwamara</td>
</tr>
<tr>
<td>113.</td>
<td>John Omango</td>
</tr>
<tr>
<td>114.</td>
<td>Christopher Omjare</td>
</tr>
<tr>
<td>115.</td>
<td>Mbega Ally Nyukwa</td>
</tr>
<tr>
<td>116.</td>
<td>Carlos Detopela</td>
</tr>
<tr>
<td>117.</td>
<td>Elias S. Kapati</td>
</tr>
<tr>
<td>118.</td>
<td>Phelix P Polomoka</td>
</tr>
<tr>
<td>119.</td>
<td>Samwel Mlungi</td>
</tr>
<tr>
<td>120.</td>
<td>Said Damba</td>
</tr>
<tr>
<td>121.</td>
<td>Shaban Athuman Mwiniyisimbo</td>
</tr>
<tr>
<td>122.</td>
<td>Juma Yahya Binya</td>
</tr>
<tr>
<td>123.</td>
<td>Alberto Namalogo</td>
</tr>
<tr>
<td>124.</td>
<td>Anderson Mwakiake</td>
</tr>
<tr>
<td>125.</td>
<td>Samwel M</td>
</tr>
<tr>
<td>126.</td>
<td>Kasinga Mwalimo</td>
</tr>
<tr>
<td>127.</td>
<td>Juma Said Mandenge</td>
</tr>
<tr>
<td>128.</td>
<td>Shaban Ahmed Makota</td>
</tr>
<tr>
<td>129.</td>
<td>Robert Silvenos Kapiga</td>
</tr>
<tr>
<td>130.</td>
<td>Abdallah Said</td>
</tr>
<tr>
<td>131.</td>
<td>Cuthbert Emanuel</td>
</tr>
<tr>
<td>132.</td>
<td>Ally Sultan</td>
</tr>
<tr>
<td>133.</td>
<td>Huruka Mohamed</td>
</tr>
<tr>
<td>134.</td>
<td>Ally Abdallah</td>
</tr>
<tr>
<td>135.</td>
<td>Yohana Marko Madeta</td>
</tr>
<tr>
<td>136.</td>
<td>Athuman Mohamed Munganyige</td>
</tr>
<tr>
<td>137.</td>
<td>Ismail Ilumba</td>
</tr>
<tr>
<td>138.</td>
<td>Issa Iddi Linyati</td>
</tr>
<tr>
<td>139.</td>
<td>Hamis Bakari Balonga</td>
</tr>
<tr>
<td>140.</td>
<td>Said R. Tangwa</td>
</tr>
</tbody>
</table>

Vincent Elias Temba
Kendo Ramadhani
Obwago Greison Nyambune
Rutajuma Augustino Ishengoma
Ahmed Shemdeoe
Akili s. Robert
Silvanus S. Kapiga
Richard Philip Lutome
Thomas Musa
Ezenu Tezura
Tamuma Athumanis
Stella Yohana
Halima Mavula
Sharifa Mtwangi
Tausi Dange
Esta Mchenoloni
Atuli Ramadhani
Ausi Yasin
Selesia Paul
Rose Betson
Rehema Msago
Hadija Turongo
Mohamed Athuman
Joshua Mkaphura
Said s. Hamis
Omari S. Ngw'ndu
Mohamed Amani Mbuga
Ashi Kijinda
Fatma Ramadhani Salahe
Aziza Bakari Maulidi
Zakia Athumanis
Mariam Gongo
Omari Mkatte Mbwara
Rashid Mbeuki Kingolile
Sultan Salehe Mzaka
Yusuf Bakari Mwago
Nasoro S. Mzamua
Crisogunos Tadei Kayombo
Salehe Kondo Mzikani
Abdallah Salum Chipite
Yusuf Shaibu Mpini
Rashid Juma Mwiniyioga
Habib Salum Kisengo
Mohamed Faraji Matimila
Abdallah Abdallah Dikele
Hashim S. Ishengoma
Said S. Mungwa
Shija M. Kazimoto
Mohamed Seif Bingwa
Andrew Cosmas Adel
Mwita Willhoka
Wilbald A. Mlaponyi
Laurence Yonga
Murshid S. Bwarushengo
O.K. Simba
Hamad Salum Kombo
Haji Ally Omari
Tumaini Tadei Kayombo
Niwaji Shabani
Issa Mtemu
Susan Njekela
Mariam Rashid
Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

MLALAKUWA RESIDENTS - MEETING HELD ON 16th January 2005

LIST OF PARTICIPANTS

1. William J. Daudi
2. Kombo Msuya
3. Sally Nassoro
4. Pili Mkumbaa
5. Jasper T. Msigwa
6. Ally Isia Mkumbaa
7. Ally Timwanga
8. Asha Omar
9. Mohamed Matope
10. Weneke Maboka
11. Asha Nassoro
12. Kachewa Liwuphe
13. Hamisi Ibrahim
14. Lendyna Martin
15. Mwanza Msuya
16. Jacqueline William
17. Francis Sonanga
18. Peter Temu
19. Godfrey Urassa
20. Josephat Swai
21. Elizabeth Temu
22. Esseliana Kalaya
23. Raphael Mwasye
24. Amri Mwangomango
25. Mary Mwambomba
26. Mwajaidi Johnson
27. Bakari Shemzitu
28. Agnes Karashawi
29. Mary Mkozy Gondwe
30. Bakuza M. B
31. Eliachi Matemu
32. Rose Shoo
33. Gwamaka Swila
34. Brown Ibrahim
35. Lucian Kazumba
36. Alen Muro (VC)
37. Jason Kalemela
38. John Shoo
39. Neema Sangi
40. Maria Modest
41. Will Mlela
42. Paul Mushiri
43. Eva Boniface
44. France Boniface
45. Florida Kalemera
46. Lambeta Yambyoga
47. Mrs. L. Rajabu
48. Justin Kimambo
49. Anna Swila
50. Siwema Swila
51. Cecilia Hassan
52. Judith Janken
53. Winnie Tarimo
54. Leondia Nyashobya
55. Hussain Songo
56. Alberto Norberto
57. Prof. Mjuwahuzi
58. Jackson Kashabo
59. Nyinisali Pallangyo - SIA Consultant
60. Susan Wagner - SIA Consultant
61. John Lazimah - Env. Engineer TANESCO
62. Julius Shilungu - Landuse Planning Commission - TRC member
63. Danford Mwaipopo - NEMC
KIWALANI RESIDENTS - MEETING HELD ON 17th January 2005

LIST OF PARTICIPANTS

1. Gania Mohamed
2. Hamis Kondo
3. Hadija Kambi
4. Mtupe Ramadhani
5. Said Selemani
6. Selemani Hamis
7. Taji Malingumuu
8. Poziana Erasmo Maliwa
9. Sultan Mwinyimkuu
10. Poul Sonda
11. Selemani Pazi
12. Medau Kilele
13. Green Simondia
14. Daniel Kulwa
15. Abdallah Lemu
16. Salum Majembe
17. John Lugiamila
18. Fikiri Mkara
19. Salamu Bofe
20. Joseph Shaban
21. Juma Osire
22. D. Kimaro
23. Maria Liziwalo
24. Halima Kimea
25. Seif Kiwanga
26. Jabri Mshindi (VC)
27. Mhamed Ally Nengema
28. Jumbe Shomari
29. Ramadhani Mangara
30. Shaban Mshauri
31. Marigareta Luhanga
32. Christine Gunhi
33. Samwel Kulwa
34. Josephat Laurence
35. Mary Gelela
36. Clement Fumbo
37. Beard Melese Mchome
38. Rajabu Said
39. Hamza Rashid Mayumba
40. Charles Mchome
41. Daniel Kulwa
42. Musa Athurman
43. Mohamed Hamis
44. Hadija Kambi
45. Jamila Ramadhani
46. Salum Tambi
47. Kapera Mohamed Manga
48. Ezron Seda
49. Mwanahinti Alui
50. Salehe Ramadhani
51. Fadhili Manigara
52. Jumbe Shomari
53. Jumanne Medadi
54. Joseph Sengerema
55. Donald Mrema
56. Martin Mussa Nghony
57. Will Kisamo
58. Maria Mtumbuka
59. Saidi Lichela
60. Mwalimu Dilunga
61. Shaban Mkongoja
62. Seleman Abdallah
63. Aisha Juma Kajaji
64. Nuriat Mohamed
65. Athuman Mjeri
66. Juma Shaban
67. Shaban Husen
68. Mwajuma Rajabu
69. Kaaj Dibiibi
70. Ally Mkidasi
71. Paulina Kikoti
72. Agapit Joseph
73. Mariam Kasikasi
74. Celestin Raphael
75. Furaha Salum
76. Pascal Protus
77. Ally Mr isho
78. Zeinabu Iddi
79. Alex Ofie
80. Hamis Shaban
81. Kassian Said
82. Mwaulid Dick
83. Kapera Mohamed Mtanga
84. Mohamed Hamis
85. Rehema Fussi
86. Husein Ramadhani
87. Amir Mameta
88. Mohamed Rashid
89. Salum Mliwazo
90. Zeinabu Jabar
91. Happy Swai
92. Maua Said
93. Salum Ngajulaje
94. Hamis Juma
95. Nyendo Mohamed
96. Mchamedali
97. Mkogoja
98. Abdallah Musa
99. Raphael Atanasi
100. Yusuf Pangoje
101. Kelvin Mrema
102. Mariam Kashasi
103. Celestin Raphael
104. Dorothea John
105. Thoms Fikiri
106. Jane Mlinda
107. Meinhad Mwamba
108. Zeena Waziri
109. Kasim Mkwamba
110. Juma Athurani
111. Ramadhani Mtupe
**MEETING BETWEEN TANZANIA AIRPORT AUTHORITY (TAA) AND TANESCO HELD ON 18<sup>th</sup> January 2005**

**LIST OF PARTICIPANTS**

<table>
<thead>
<tr>
<th>1.</th>
<th>David Hayward</th>
<th>RAP CONSULTANT</th>
<th>TANESCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Haruna J. Barongo</td>
<td>CONSULTANT - AEROPROJECT LTD</td>
<td>TAA</td>
</tr>
<tr>
<td>3.</td>
<td>Agnes Mwasumbi</td>
<td>VALUER UCLAS</td>
<td>TANESCO</td>
</tr>
<tr>
<td>4.</td>
<td>John Chonga</td>
<td>LAND SURVEYOR</td>
<td>TANESCO</td>
</tr>
<tr>
<td>5.</td>
<td>John Lazimah</td>
<td>ENVIRONMENTAL ENGINEER</td>
<td>TANESCO</td>
</tr>
<tr>
<td>6.</td>
<td>Mansur H. R.</td>
<td>ENVIRONMENTAL ENGINEER</td>
<td>TANESCO</td>
</tr>
<tr>
<td>7.</td>
<td>Shechanbo W.</td>
<td>CIVIL ENGINEER TAA Head Office</td>
<td>TAA</td>
</tr>
<tr>
<td>8.</td>
<td>Nyinisaeli Palangyo</td>
<td>SIA Consultant</td>
<td>TANESCO</td>
</tr>
<tr>
<td>9.</td>
<td>Susan Wagner</td>
<td>SIA Consultant</td>
<td>TANESCO</td>
</tr>
</tbody>
</table>

---

**MBAGALA KUU RESIDENTS - MEETING HELD ON 18<sup>th</sup> January 2005**

**LIST OF PARTICIPANTS**

<table>
<thead>
<tr>
<th>1.</th>
<th>Ally Atikuman</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Mzee Rashid Chongo</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Hamisi Fikiri</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Juma Ajafi</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Eliasaidi Kijanjambwaja</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Seledman Said</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Hamis Mapamba</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Maudid Bondo</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Hila Yusuf</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Swalehe Mambu</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Juma Said</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Athumani Kitetagani</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Abdallah Twalib</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Vincent Mika</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Christopher Muya</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Anthony Kanardi</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Shukuru Omari</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Self Yusuf</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Amroshi Simon</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Hamis Salum</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Mutuma abadellah</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Zuhura Ramadhani</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Said Omar</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Sabato Mantalo</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Ally Hatib</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Daud Mshana</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Omar Mshehehungwa</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Seif Omar</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Mohamed Issa</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Ally Gombwa</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>Sultan Said</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Salum Lulo</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>Abdullah Miketo</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>Mwanahawa Omar</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>Mwanahawa Mtumwa</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>Susan Anthony</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>Samwel Mtui</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>Samson N</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>Benjamene Valentine</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td>Asha Said</td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>Fatuma omary</td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>Bahati Malola</td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>Fatuma Said</td>
<td></td>
</tr>
<tr>
<td>44.</td>
<td>Rajabu Hasan</td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>Julian Mushi</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>Tima Koja</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>Hisaya ally</td>
<td></td>
</tr>
<tr>
<td>48.</td>
<td>Mrs. M. Moshiro</td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>Hawa Masudi</td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>Mrs. Madega</td>
<td></td>
</tr>
<tr>
<td>51.</td>
<td>Mrs. Likongo</td>
<td></td>
</tr>
<tr>
<td>52.</td>
<td>Mwanahamisi Saidi</td>
<td></td>
</tr>
<tr>
<td>53.</td>
<td>Mariam Mtumwa</td>
<td></td>
</tr>
<tr>
<td>54.</td>
<td>Anna Vicen</td>
<td></td>
</tr>
<tr>
<td>55.</td>
<td>Z. Omari</td>
<td></td>
</tr>
<tr>
<td>56.</td>
<td>Regionsa Muya</td>
<td></td>
</tr>
<tr>
<td>57.</td>
<td>Sakina Rashid</td>
<td></td>
</tr>
<tr>
<td>58.</td>
<td>Asha Abdallah</td>
<td></td>
</tr>
<tr>
<td>59.</td>
<td>Rehema John</td>
<td></td>
</tr>
<tr>
<td>60.</td>
<td>Joyce Manyanga</td>
<td></td>
</tr>
<tr>
<td>61.</td>
<td>Kathuaita Salum</td>
<td></td>
</tr>
<tr>
<td>62.</td>
<td>Haki Yang</td>
<td></td>
</tr>
<tr>
<td>63.</td>
<td>Jane Venance</td>
<td></td>
</tr>
<tr>
<td>64.</td>
<td>James Robert</td>
<td></td>
</tr>
<tr>
<td>65.</td>
<td>Fatuma Hasan</td>
<td></td>
</tr>
<tr>
<td>66.</td>
<td>Zacharia Mgnona</td>
<td></td>
</tr>
<tr>
<td>67.</td>
<td>Bashira Salum</td>
<td></td>
</tr>
<tr>
<td>68.</td>
<td>Mariam Omari</td>
<td></td>
</tr>
<tr>
<td>69.</td>
<td>Fatuma Hassan</td>
<td></td>
</tr>
<tr>
<td>70.</td>
<td>Zena Said</td>
<td></td>
</tr>
<tr>
<td>71.</td>
<td>Asha Mtumwa</td>
<td></td>
</tr>
<tr>
<td>72.</td>
<td>Tukae Selemeni</td>
<td></td>
</tr>
<tr>
<td>73.</td>
<td>Bakari Abdullah</td>
<td></td>
</tr>
<tr>
<td>74.</td>
<td>Sofia Said</td>
<td></td>
</tr>
<tr>
<td>75.</td>
<td>Rahman Mahimba</td>
<td></td>
</tr>
<tr>
<td>76.</td>
<td>Ashura Mtwa</td>
<td></td>
</tr>
</tbody>
</table>
77. Mwazani Nyembe  
78. Halima Shaban  
79. Mariam Kilindwa  
80. Sada Chengwa  
81. Magreth Misingwa  
82. Mwangi  
83. Mwinyijuma Kombo  
84. Mbonde Sabini  
85. Hamisi Ngomeke  
86. Ally Mrisho  
87. Bakari Kiukula  
88. Abdallah Ngondae  
89. Abdallah Yusuf  
90. Kwanga Mkwanga  
91. Asili Salehe  
92. Ally Mohamed  
93. Bakari Jonga  
94. Salum Said  
95. Mwanahawa Omery  
96. Abdallah Meko  
97. Mr. Charle (Councilor)  
98. Zamwa Abdallah

**MCHIKICHINI RESIDENTS - MEETING HELD ON 19th January 2005**

**LIST OF PARTICIPANTS**

1. Khatibu Riyami – VC  
2. Rajabu Zegea – Asst. VC  
3. Jumanne Kibona  
4. Rajabu Mdodo  
5. Abdulkadir Kagandi  
6. Thabit Kadulo  
7. Kawasa Kasanda  
8. Selem An Nomohid  
9. Kondo Mohamed  
10. Hamis Kaganja  
11. Alnasri Semlengwa  
12. Rashid Ally  
13. Doto Ally  
14. Venance Tarimo  
15. Idd Kitengo  
16. Hasan Salum  
17. Ramadhani Rashid  
18. Ramadhani Fimba  
19. David Sempira  
20. Caroline Joseph  
21. Maua Rashid  
22. Valeriano  
23. Omary Kishimba  
24. Johani Mkonganya  
25. Stumai Omery  
26. Ally Magoga  
27. Jumanne Kadulo  
28. Likulile Musa  
29. Shaban Kondo  
30. Hadija Omery  
31. Zoua Kasamba  
32. Teresa Robart  
33. Habibu Kika  
34. Shaban Adam  
35. Kulwa Kalenga  
36. Moshi Omery  
37. Juma Magoga  
38. Rehema Maulid  
39. Joseph Simbaulanga  
40. Fatuma Hajaji  
41. Mwanahamis Athumani  
42. Hamis Daud  
43. Tabita Athumani  
44. Said Walala  
45. Masangura Joshua  
46. Amina Muny  
47. Arubugast Peter  
48. Rashid Mgeni  
49. Fatuma Hassan  
50. Fasi Pius  
51. Zuhura Fadhili  
52. Hamisa Chaa  
53. Rajabu Omery  
54. Amna Shabani

**VIJIBWENI RESIDENTS - MEETING HELD ON 20th January 2005**

**LIST OF PARTICIPANTS VIJIBWENI WARD**

1. Chaka Nassoro (WEO)  
2. Hatibu Ngulata (Chairman Kibene Hamlet)  
3. Mohamed Zakuanu (Chairman Vijibweni Hamlet)  
4. Masudi Bofu (Chairman Mkwayuni Hamlet)  
5. John Lazimah TANESCO  
6. Suzan Wagner – Consultant TANESCO  
7. Nyinisaeli Palangyo – Consultant TANESCO  
8. Yahaya Kambo Waziri  
9. Mohamed Aliy Mwichande  
10. Edward Elasto Mabula  
11. Joel Michael Ojode  
12. Silvester Juma Odiro  
13. Abbas Salim Muhumba  
14. Twaha Abdalla  
15. Ally Saidi Mtonga  
16. Godilisten Lema  
17. Hamisi Omery Mmoke  
18. Saidi Mfume Saidi  
19. Thomas Marie Brudo  
20. Prisila Michael Onyango

_Social Impact Assessment Draft Final Report_
21. Maryam Yussuf Issa
22. Siwazuri Ornary Mbahara
23. Satum Said Rashid
24. Mwanahamisi Ornary Moke
25. Faustina Buliga Chiloto
26. Joseph Magori Harusi
27. Said Rashid Mmaene
28. Jane Michael Onyango
29. Rehema Zuberi Abdallahamin
30. Felix Steven Msela
31. John Mayende Nyaranga
32. Habibu Ahamad Nyambi
33. Hamisi Mohamed Sanata
34. Amin Abdallah Sudi
35. Amina Mgeni Awazi
36. Joseph Augustine Mwamahala
37. Michael Thomas Mwamaleni
38. Mohamed Aliy Mohamed
39. Fatuma Abdallah Kinyegoli
40. Mrs. Nyanyanche Anna Nannai
41. Sylvester John Charani
42. Lucas Mandia Sefu
43. Kulusum Hamad Ntenya
44. Habirka Hamisi Manoko
45. Shomvi Kondo
46. Sakdi S. Shemvu
47. George John John
48. Mohamed Hatibu Jumbe
49. Edith Samson Swai
50. Said Juma Msomi

KURASINI MIVINJENI RESIDENTS - MEETING HELD ON 20th January 2009

LIST OF PARTICIPANTS

1. H.S. Mbeto (VC)
2. Munna J. (WEO)
3. S. Mandali (WEO)
4. Kimati (Counselor)
5. Mhando A. Mhando (Secretary)
6. Ayruha Mwanga (Member WDC)
7. Otagwa Marwa
8. Hasni Mauviri
9. Peters Kwakwa
10. Monica Peter
11. Amina Seleman
12. Magreth Nkanali
13. Shaban Ngonji
14. Mbwaha Musa
15. C.R. Machengo
16. Lwa Sisamo
17. Andrew Mgbima
18. Kiwasi Kifasi
19. Daniel Yusuf
20. Kiwale Mbuya
21. Mrs. Jagali
22. Mrs. Mboya
23. Kalumia
24. Matias John
25. Francis Mngono
26. Rashid Sultan
27. Peter Chilima
28. John Simon
29. Maalid Nyirali
30. D. Mwakibee
31. Anthony Chishko
32. Staley Charles
33. Ibrahim Muaume
34. Shaban Mwamambisi
35. Sadiki Kazimoto
36. Manyama Maudi
37. Neema Maunde
38. Junta Yusuf
39. Anna Jonas
40. Dany Kileo
41. Martin Chisane
42. P. Mbope
43. Nasoro Mkwayo
44. Samuel Ndana
45. Nyundo
46. Edwin Endrew
47. M. Mboya
48. Mrs. Kibona
49. Ernest Merac
50. J. John
51. Emanuel Madungo
52. Mbugani Ramadhani
53. Yakabo Misisam
54. Robert Menesti
55. Ally Seif
56. B. Ngagwa
57. Josephine
58. Fortuna Mupando
59. Selina Masa
60. E.M. Malewo
61. Rekwaas John
62. Gabriel Elias
63. Maneno Yahaya
64. Emanuel Temba
65. Bambo
66. Omar Matibwa
67. A. Mihinga
68. Living Temba
69. D. Dau
70. J. James
71. S. Mwilongo
72. Uhai Ayubu
73. O. John
74. Said Mohamed
75. Abdullah Seden
76. Tatu Said
77. Saka Yahaya
78. Sande Kazimoto
79. Abdullah Mmbakuki
80. Rashid Sulemani
81. Isaya Endrew
82. Dismas Chilongo
Reinforcement and Upgrade of Dar es Salaam, Kilimanjaro and Arusha Transmission and Distribution System Project

83. Joseph Marwa
84. Joseph Kadondo
85. Kibibi Athuman
86. Musira J. F.
87. Richard Mesanga
88. Getis Simangi
89. Florence Nkya
90. Prey Nkya
91. Agnes Mpija
92. Abtwalib Mfaume
93. Ceverina Hendrew
94. Monika Mboya
95. Winnie Kituku
96. Peter Hiza Rogars
97. Daniel Cheni
98. Muro Mujahid
99. Steward Mchini
100. Hussen Mbaruku
101. Franck Mbaruku
102. Ida Temu
103. Hamis Nassoro
104. Rose Gadieli
105. P. Muniye
106. Godfrey Lyimo
107. Christopher Dengule
108. Ibrahim Bakari
109. Pouline Rwezaure
110. P. Taipo
111. Shaban Mohamed
112. Aleda Mwamboneke
113. M. Mrisho
114. Edward Mwamboneke
115. Tabia Kimicha
116. Elizabeth Methew
117. P. Mpangala
118. Mwagurika Kalengo
119. Mkenga S.R.
120. David Kambo
121. T. K. Mrema
122. A.J. Kisanga
123. Farida Ally
124. Amina Haibu

KURASINI MINAZINI RESIDENTS - MEETING HELD ON 21st January 2005

LIST OF PARTICIPANTS

1. Joe Mboya
2. Yahaya Masangula
3. Matenga Simba
4. Easter Ntera
5. Haji Mulid
6. Judith Juma
7. Jadishi Singh
8. Mrs. Gabagambi
9. Zainabu Mbuta
10. Chrispin
11. Innocent Shirima
12. Rose Lyamuya
13. Abdikadri Ormary
14. YaaMungu elia
15. M. A. Mkango
16. Mrs. E. Munisi
17. Muna J. (WEO)
18. A. H. Dachi
19. C. Semzia
20. P. Hamisi
21. Zainabu Mderme
22. Emanuel Sangawe
23. P.K. Munisi

BONDE LA MPUNGA RESIDENTS - MSASANI WARD - MEETING HELD ON 21st January 2005

LIST OF PARTICIPANTS

1. Edward Barongo
2. George Kahama
3. Susana Msangi
4. Elizabert Lukumai
5. Leodga Tenga
6. Ramadhani Boyi
7. Abdallah Hamis
8. Mkesha Mwalimu
9. Epafro Dito Bwakea
10. Paul Mshti
11. Seif Sudi
12. Athuman Mbulia
13. Raymos Shanga
14. G. Mshti (Ag. WEO)
### UBUNGO RESIDENTS - MEETING HELD ON 22nd January 2005

**LIST OF PARTICIPANTS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pascal Ngazagu</td>
</tr>
<tr>
<td>2.</td>
<td>Tamarra Issa</td>
</tr>
<tr>
<td>3.</td>
<td>Selemani Mwinyimkuu</td>
</tr>
<tr>
<td>4.</td>
<td>Ely Sultan</td>
</tr>
<tr>
<td>5.</td>
<td>Said Chemu</td>
</tr>
<tr>
<td>6.</td>
<td>Juma Penza</td>
</tr>
<tr>
<td>7.</td>
<td>Abdul Nkwama</td>
</tr>
<tr>
<td>8.</td>
<td>Ramadhanu Abdallah</td>
</tr>
<tr>
<td>9.</td>
<td>Shaban Hassaa</td>
</tr>
<tr>
<td>10.</td>
<td>Rashid Romari</td>
</tr>
<tr>
<td>11.</td>
<td>Jafar Habib</td>
</tr>
<tr>
<td>12.</td>
<td>Halima Mohamed</td>
</tr>
<tr>
<td>13.</td>
<td>Fatuma Nasseru</td>
</tr>
<tr>
<td>14.</td>
<td>Omary Swedi</td>
</tr>
<tr>
<td>15.</td>
<td>Hassan Swidi</td>
</tr>
<tr>
<td>16.</td>
<td>Hafizani Harisi</td>
</tr>
<tr>
<td>17.</td>
<td>A. L. Mzangi</td>
</tr>
<tr>
<td>18.</td>
<td>Asha Omar</td>
</tr>
<tr>
<td>19.</td>
<td>Beth Chamila</td>
</tr>
<tr>
<td>20.</td>
<td>Honorata Mshoho</td>
</tr>
<tr>
<td>21.</td>
<td>Madina Chonjo</td>
</tr>
<tr>
<td>22.</td>
<td>Habiti Musa</td>
</tr>
<tr>
<td>23.</td>
<td>Thomas Yusta</td>
</tr>
<tr>
<td>24.</td>
<td>Sadiki Chonjo</td>
</tr>
<tr>
<td>25.</td>
<td>John Tibiir</td>
</tr>
<tr>
<td>26.</td>
<td>Ally Said</td>
</tr>
<tr>
<td>27.</td>
<td>Absalom Mashoto</td>
</tr>
<tr>
<td>28.</td>
<td>Hassan Ally</td>
</tr>
<tr>
<td>29.</td>
<td>Hemed Salim</td>
</tr>
<tr>
<td>30.</td>
<td>Abdallah Salum</td>
</tr>
<tr>
<td>31.</td>
<td>Awani Rashid</td>
</tr>
<tr>
<td>32.</td>
<td>Amoor Marwood</td>
</tr>
<tr>
<td>33.</td>
<td>Ely Mangari</td>
</tr>
<tr>
<td>34.</td>
<td>Juma Yolki</td>
</tr>
<tr>
<td>35.</td>
<td>Kitwama Kinyogoli</td>
</tr>
<tr>
<td>36.</td>
<td>Seif Msanga</td>
</tr>
<tr>
<td>37.</td>
<td>Mariam Habibu</td>
</tr>
<tr>
<td>38.</td>
<td>As Sri Atbuman</td>
</tr>
<tr>
<td>39.</td>
<td>Fatuma Kamki</td>
</tr>
<tr>
<td>40.</td>
<td>Mariam Hafisi</td>
</tr>
<tr>
<td>41.</td>
<td>Mamaashu Juma</td>
</tr>
<tr>
<td>42.</td>
<td>Halima Kondo</td>
</tr>
<tr>
<td>43.</td>
<td>Hadija Omary</td>
</tr>
<tr>
<td>44.</td>
<td>Tatu Mzanga</td>
</tr>
<tr>
<td>45.</td>
<td>Aziza Huen</td>
</tr>
<tr>
<td>46.</td>
<td>Hamad Masukila</td>
</tr>
<tr>
<td>47.</td>
<td>Hamsi Hafisi</td>
</tr>
<tr>
<td>48.</td>
<td>Said Mrisho</td>
</tr>
<tr>
<td>49.</td>
<td>Ibrahim Kindandsali</td>
</tr>
<tr>
<td>50.</td>
<td>Yusuf Sait</td>
</tr>
<tr>
<td>51.</td>
<td>Rukia Mrisho</td>
</tr>
<tr>
<td>52.</td>
<td>Zainebu Rimba</td>
</tr>
<tr>
<td>53.</td>
<td>Rukia Omary</td>
</tr>
<tr>
<td>54.</td>
<td>Fatuma Mquni</td>
</tr>
<tr>
<td>55.</td>
<td>Halima Mwinyimkuu</td>
</tr>
<tr>
<td>56.</td>
<td>Hadja Ally</td>
</tr>
<tr>
<td>57.</td>
<td>Yusuf Dhunga</td>
</tr>
<tr>
<td>58.</td>
<td>Mrisho</td>
</tr>
<tr>
<td>59.</td>
<td>Hamad Awadhi</td>
</tr>
<tr>
<td>60.</td>
<td>Abdallah Nkumba</td>
</tr>
<tr>
<td>61.</td>
<td>Omary Zahoro</td>
</tr>
<tr>
<td>62.</td>
<td>Mzee Dick</td>
</tr>
<tr>
<td>63.</td>
<td>Peter Thomas Asenga</td>
</tr>
<tr>
<td>64.</td>
<td>Mulaif Said</td>
</tr>
<tr>
<td>65.</td>
<td>Salehe Kawambwa</td>
</tr>
<tr>
<td>66.</td>
<td>Mkndawile</td>
</tr>
<tr>
<td>67.</td>
<td>Said Musa</td>
</tr>
<tr>
<td>68.</td>
<td>Chande Issa</td>
</tr>
<tr>
<td>69.</td>
<td>Hasan Ally</td>
</tr>
<tr>
<td>70.</td>
<td>Kasheba Bwila</td>
</tr>
<tr>
<td>71.</td>
<td>Salehe Bwila</td>
</tr>
<tr>
<td>72.</td>
<td>Seleman Seleman</td>
</tr>
<tr>
<td>73.</td>
<td>Most Omary</td>
</tr>
<tr>
<td>74.</td>
<td>Tobias Kambi</td>
</tr>
<tr>
<td>75.</td>
<td>Abdallah Mwinyimkuu</td>
</tr>
<tr>
<td>76.</td>
<td>Doto Mashukila</td>
</tr>
<tr>
<td>77.</td>
<td>Fatuma Zahoro</td>
</tr>
<tr>
<td>78.</td>
<td>Atumani Mwintanga</td>
</tr>
<tr>
<td>79.</td>
<td>Ally Msanga</td>
</tr>
<tr>
<td>80.</td>
<td>Halid Musa</td>
</tr>
<tr>
<td>81.</td>
<td>Majid Salim</td>
</tr>
<tr>
<td>82.</td>
<td>Hussein Ally</td>
</tr>
<tr>
<td>83.</td>
<td>Asia Kazembe</td>
</tr>
<tr>
<td>84.</td>
<td>Mwanahamisi Bilali</td>
</tr>
<tr>
<td>85.</td>
<td>Asha Mgeni</td>
</tr>
<tr>
<td>86.</td>
<td>Mwajuma Hamed</td>
</tr>
<tr>
<td>87.</td>
<td>Mwasha Ngingite</td>
</tr>
<tr>
<td>88.</td>
<td>Mustafa Bwila</td>
</tr>
<tr>
<td>89.</td>
<td>Abdallah Msoni</td>
</tr>
<tr>
<td>90.</td>
<td>Said Seif</td>
</tr>
<tr>
<td>91.</td>
<td>Zahara Jafar</td>
</tr>
<tr>
<td>92.</td>
<td>Hafizani Nastra</td>
</tr>
<tr>
<td>93.</td>
<td>Daud Paul</td>
</tr>
<tr>
<td>94.</td>
<td>Yohana Msangi</td>
</tr>
<tr>
<td>95.</td>
<td>Mirak Nsono</td>
</tr>
<tr>
<td>96.</td>
<td>Labeet Kundali</td>
</tr>
<tr>
<td>97.</td>
<td>Abdallah Shomari</td>
</tr>
<tr>
<td>98.</td>
<td>Halima Sultan</td>
</tr>
<tr>
<td>99.</td>
<td>Omary Sultan</td>
</tr>
<tr>
<td>100.</td>
<td>Donard Dickson</td>
</tr>
<tr>
<td>101.</td>
<td>Imanuel Sama</td>
</tr>
<tr>
<td>102.</td>
<td>Duma Abdallah</td>
</tr>
<tr>
<td>103.</td>
<td>Charles Thomas</td>
</tr>
<tr>
<td>104.</td>
<td>Abdul Anania</td>
</tr>
<tr>
<td>105.</td>
<td>Ally Mkopora</td>
</tr>
<tr>
<td>106.</td>
<td>Abed Zahoro</td>
</tr>
<tr>
<td>107.</td>
<td>Juma Saud</td>
</tr>
<tr>
<td>108.</td>
<td>Tumaini Msangi</td>
</tr>
<tr>
<td>109.</td>
<td>Jerard Mushi</td>
</tr>
<tr>
<td>110.</td>
<td>Abdallah Kilembe</td>
</tr>
<tr>
<td>111.</td>
<td>Nasoro Njohoka</td>
</tr>
<tr>
<td>112.</td>
<td>Abdallah Masukila</td>
</tr>
<tr>
<td>113.</td>
<td>Jerema Maro</td>
</tr>
<tr>
<td>114.</td>
<td>Said Awadhi</td>
</tr>
<tr>
<td>115.</td>
<td>Shahina Msanga</td>
</tr>
<tr>
<td>116.</td>
<td>Kimanzi Ally</td>
</tr>
</tbody>
</table>
YOMBO BUZA RESIDENTS - MEETING HELD ON 22nd January 2005

LIST OF PARTICIPANTS

1. Elly Kinyaha
2. Mwanahija Ally
3. Stumai Bakari
4. O.I. Kiyama
5. Said Mwambungo
6. Magareth Stephano
7. Halima Mohamed
8. Eda Somoyo
9. Habiba Ahmed
10. Breshi Mwandenge
11. Anna Samwel
12. Rehema Ally
13. Ally Bangimoto
14. Mary Bernard
15. Romana Kimario
16. Halim Abdul
17. Theodota Mrema
18. Ally Shaban
19. Abdallah Mbawala
20. Ibrahim Moshi
21. Mustafa Liaza
22. Musa Bani
23. Isi Selemani
24. Shabani Zuberi
25. Said Mohamed
26. Dickson Leschie
27. Anthory Simon
28. Charles Miolera
29. Emanuel John
30. Abdul Juma
31. Fatuma Hamis
32. Roda Kijugu
33. Asha Mwnyimkuu
34. Mwaimuna Halfani
35. Rukia Mbelenbe
36. Abdallah Mfandike
37. Grade Mioka
38. Josephene Martin
39. Jaspar Kwayu
40. Elia Shao
41. Elice Kwayu
42. Ashura Fundi
43. Zainabu Selemani
44. Perus Kapesu
45. Asia Omary
46. Esta Charles
47. Victoria Mkanuge
48. Fidelia Biabato
49. Maua Martin
50. Mama Kapange
51. Mama Hussein
52. Hadiya Mrope
53. Mwanahawa Waziri
54. Zulfia Maulidi
55. Sophia Hamis
56. Tunu Kundael
57. Juma Kisinge
58. Alexander M
59. Hemed Hemed
60. Athuman Kisinge
61. Hiadii Mhamed
62. Said Mganga
63. Athuman H
64. Mrisho Kamilisha
65. Maalim Zaid
66. Shaban Chandugu
67. Omari Mpera
68. Salehe Kilomole
69. Hamis Sultan
70. Ally M
71. Abdallah Keleso
72. Rashid Ally
73. Hilary Issa
74. Hamis Omary
75. Kasim Abdallah
76. Twalibu Hamisi
77. Hamis Ngelamija
78. Mohamed Omary
79. Abdalah Kinyogoli
80. Tememilisi Mbova
81. Buchedi Musheba
82. Airin Malinda
83. Juma sinde
84. Mohamed Mchukuchu
85. Said Mageja
86. Hamis Hassan
87. Mazoe Mohamed
88. Bashiri Hashim
89. Elimusasi Mshombozi
90. Haji ally
91. Endrew Kiranga
92. John Mdele
93. Jamanne Maganga
94. Salehe Ngakoma
95. Ray Mpelenbe
96. Bakari Mbichi
97. Mohamed Mwinyi
98. Ely Yusuufu
99. Mohamed Mkolemwa
100. Jafari Hussein
101. Mweza Mbondo
102. Mkranga Joseph
103. Hamisi Mzanga
104. Ibrahim Ngalipe
105. Hashim Husein
106. Juma Salim
107. Sostanes Kajua
108. Salma Issa
109. Augustino Ngowi
110. Sylvanos Kitamurri
111. Faraji Ngwalasa
112. Mohamed Ibope
113. Juma Ggogoyo
114. Said Issa
115. Mgeni Mwalango
116. Ramadhan Mubhi
117. Salumi Kondo
118. Rukia Saidi
119. Mwanhamisi Saidi
120. Cheka Shomari
121. Mzee Rusi
122. Martin Kaaya
123. Frances Mwalingu
124. Ina Naazael
125. Bahati Mbelukina
126. Emiliani Mlaka
127. Ernest Swigo
128. Jackson Peramila
129. Raphael Daud
130. Clemens C
131. Ismail Katanga
132. Ali Kibwana
133. Masoud Kaurata
134. Clif Samu
135. Mohamed Mwendo
136. Juma Kusanda
137. Said Nchakucha
138. Octovian Keta
139. Mkatalimunu B.
140. Julius Komba
141. Agnes Mgayo
142. Selemani Chambo
143. Rajabu Saltani
144. Mohamed Shabani
145. Must Mamba
146. Daniel Z
147. Matias Kavanga
148. Adam Mkumba
149. Juma Makanu
150. Musa Mambukwa
151. Mwajuma Faraja
152. Amina Mamba
153. Idii Athuman
154. Nassoro Juma
155. Ally Hamed
156. Amida Abdul
157. Zainabu Mikiadi
158. Sakina Mkololo
159. Shabani Dima
160. Frtery Matemu
161. Paulo Peter
162. Abdallah Mmomo
163. Zalbatai Haule
164. Rashid Kawambwa
165. Kaptain Makinda
166. E. Mwabungu
167. Jacob John
168. Maurice Mhando
169. Mariam Mustafa
170. Agripina Rashes
171. Mikiadi Kanyigile
172. Nasser Mtulia
173. S. Bakari
174. Salum Njechele
175. Shahab Ibrahim
176. Rhoda Filbert
177. William Ngaiza
178. Omari Amir
179. Herran Dzuzis
180. Stephen Mtulo
181. Lucas Mtulo
182. Said Mkuungu
183. Hamis Namkona
184. Abdallah Nasri
185. Hassan Seif
186. Benarad Ngaita
187. John Nunduma
188. Ahmad Abdul
189. Miraji Athuman
190. Hasan Chedaza
191. Yusuf Omara
192. Jumane Hassan
193. Abamed Mnubi
194. Salum Lukulo
195. Mustafa Machenge
196. Juma Mussa
197. Athuman Ngwee
198. Rajabu Mwinyinkuu
199. Shadrack Kohi
200. Mohamed Halfani
201. Maimuna Said
202. Ally Seif
203. Revocatus Joseph
204. Hamis Kazainari
205. Nuru Hamis
206. Thabit Issa
207. Estomine Kweka
208. Ally Nahovelala
209. Teresia Mvungi
210. Samii Hikika
211. Abdallah Abdallah
212. Omari M
213. S. S. Kabange
214. Robart Komba
NJIRIO - ENGUTO WARD RESIDENTS - MEETING HELD ON 25th NOVEMBER 2004

LIST OF PARTICIPANTS

1. Lobulu Sireeti
2. Abdul Majid Ahmed
3. Innocent Zelothe C/O Makundi Boaz
4. Elisipha Loth
5. Monika Kisiri
6. E.A. Molllel
7. Elisipha Philip
8. Paul Kamete
9. Philip Memruthi
10. Jackson John
11. Hermany Richard
12. Khalid Issa Mohamed
13. Zainabu Sindato
14. Petro Kamete
15. Lawrence Memruthi
16. Lengai Namuriri
17. Japhet Silas
18. Lubanguti Longamun
19. Felex Samkwa
20. Marko Simon
21. Stephano Merinyo
22. James Memruthi
23. Obadia Kisiri
24. Abdallah Ismail
25. Erasto Mleleji
26. John Abrahamu
27. Michael Memruthi
28. Bernadi Memruthi
29. Edward Sikon
30. Joseph Memruthi
31. Meshack Shangai
32. Mohamed Abrahama
33. Ezekiel Shangai
34. Elias Memruthi
35. Estomii Ideseya
36. Magnet Steven
37. Mrs Lukeneio R. Mbaga
38. Philiop Eliapenda
39. Coelastina Kazzara
40. Ramadhani Ibrahim Lesian
41. Stephen George Molllel (Councilor)
42. Loiti S. Kola (Chairperson Hamlet C1)
43. Elizabeth Mtowa (Chairperson Hamlet c2)
44. George K. Mkenyi (WEO Engutoto)
45. John Lazimah – Env. Engineer TANESCO HQ
46. Mansur Hamduni – Env. Engineer TANESCO HQ
47. Dr. Agnes Mwakaje – IRA UDSM - TRC Member
48. Mr. Julius Shilungushela – MLHS – TRC Member
49. Mr. Edward Kihunruwa – MLHS – TRC Member

DOLI ESTATE - MEETING HELD ON 01st February 2005

LIST OF PARTICIPANTS

1. Mr. Tony Christianakis – BCW Holdings Limited
   Manyata Estate

SANYA STATION RESIDENTS MASAMA RUNDUGAI WARD - MEETING HELD ON 01st February 2005

LIST OF PARTICIPANTS

1. Sabore Molllel (VEO – Sanya Station)
2. Lewanga Ngitori
3. Mongesh Lewanga
4. Talsila Kisiri Lewanga

NGOSERO RESIDENTS - MEETING HELD ON 01st February 2005
LIST OF PARTICIPANTS

1. Mariki Christopher
2. Ferdinand Christopher
3. Yohana Abdillah
4. Adolf Sigfried
5. Joseph Minde (Hamlet Chairman)
6. Descori Mvungi (VEO)
7. Rashid Chandeha
8. Thiniel Saidi
9. Suzan Richard

LONGOI VILLAGE RESIDENTS - MEETING HELD ON 01st February 2005

LIST OF PARTICIPANTS

1. Daniel Nguteni Mollel
2. Lewanga Kituru
3. Sengea Juma Mlacha (VEO)
4. Rafael Ireni Munishi (VC)
5. Loti Puza – Village CCM Chairman

RUNBUGAI AND CHEKIMAJI RESIDENTS MASAMA LUNBUGAI WARD - MEETING HELD ON 02nd February 2005

LIST OF PARTICIPANTS

1. Joseph Boniface (VEO - Chekimaji)
2. Abdallah Rashid (VEO - Rundugai)
3. Lucas Kirango
4. Elibariki Lucas Mbiwe (Village Chairman)
5. John Joseph
6. Felician Alphonsee
7. Habiba Omar
8. Hanzo Juma
9. Leonard King’osi
10. Skaban Omar
11. Venance Mtenga
12. Joseph Pius
13. Wenderin King’osi
14. Joseph Tumaini
15. Saigana Musa
16. Omari Saidi
17. Khadija Urasse
18. Eugenia Mandai
19. Nelson Minja

KAWAYA RESIDENTS - MEETING HELD ON 02nd February 2005

LIST OF PARTICIPANTS

1. Yassini Mwalimu (VEO - Kawawa)

KIKAFU AND MIJONGWENI RESIDENTS MOSHI RURAL DISTRICT MEETING HELD ON 02nd February 2005

LIST OF PARTICIPANTS

1. John Fidelix (VEO – Mijongweni)
2. George Gwaba**
3. Dainesi Kimaro**
4. Amina Mohammad
5. Salome Danieli
6. Josephati John
7. Mary Laurent**
8. Angelitha Raphael
9. Masumbuko Joseph
10. Bonifasi Zuberi**
11. Hassein Amani**
12. Magrethi Greene**
13. Mary Peter
14. Ambrosi Mwenda pole
15. Victoria Tadei
16. Queen Vicent
17. Gaspar Mwangi
18. Clemence Ambrosi
19. Gaspar Mwaimu
20. James Masanzula
21. Ludoviki Samdala**
22. Modei Michael**
23. Jawabu Ali
24. Juma Ramadhani**
25. Elibariki Ngowi (VEO – Kikafu)
26. Aioicy Mushu
27. Swalehe Juma (Chairman Kikafu Chini)
28. Michael Chuwa
** Did not participate in the meeting themselves but they are affected by the project

MALULA RESIDENTS IN KING'ORI WARD ARUMERU DISTRICT - MEETING HELD ON 03rd
February 2005

LIST OF PARTICIPANTS

1. Anieti Gothelfu Pallangyo
2. Obembi Matayo Isangya
3. Ezroni Matayo Isangya
4. Lais Sailepu Mollel
5. Naina Siara Laizer
6. Hasan Mursali
7. Huseni Mursali
8. Zakayo Lakinjive Mollel
9. Ismail Ndiraka Mollel
10. Ndiraka Molel Mollel
11. Paulina Anderson Nnko
12. Abrahamu Anderson Nnko
13. Eliau Anderson Nnko
14. Sabaya Tarangeli Mollel
15. Mertkino Anderson Nnko
16. Lorivi Anderson Nnko
17. Daniel Anderson Nnko
18. Lazaru Anderson Nnko
19. Labani Lazaru Nnko
20. Richard Ndosy
21. Sumayani Mevaleri Laizer
22. Julias Ndikala Mollel
23. Yona Lazaru Nnko
24. Lirunde Lodondere Lukumay
25. Losana Kimbele Mollel
26. Martin Kimbele Mollel (Village Chairman)
27. Sumel Nkikaka Mollel
28. Naisilragi Anderson Nnko
29. Lea Anderson Nnko
30. Karankira Nkirwa Mbios
31. Amirieli Elisa
32. Zakaria A. Nnko
33. Joseph Hosih Mwaissiga
34. Simon Anderson Nnko
35. Loianguwaki Anderson Nnko
36. Losetani Loloita Mollel
37. Pendaali Lazaru Nnko
38. Daniel A. Pallangyo (VC)
39. Afraeli M. Majie – Village Committee Member

SAMARIA RESIDENTS - MEETING HELD ON 03rd February 2005

LIST OF PARTICIPANTS

1. Geoffrey J. Pallangyo
2. Gadieli M. Pallangyo
3. Daniel N. Akyoo
4. Yohana A. Molel
5. Elisai M. Laizer
6. John A. Pallangyo
7. Samwel E. Sikawa
8. Denis Ndokai
9. Joseph L. Laizer
10. Mesiai Andrea Mollel
11. Sifael Talala Mollel
12. Anna Wilson Pallangyo
13. Rogathie Elirehema Akyoo
14. Nos Long’oa
15. Mborso L. Laizer
16. Daudi Emanuel Pallangyo
17. Ndebera Samosi
18. Emanueli Luka

MARORONI RESIDENTS IN MARORONI WARD ARUMERU DISTRICT MEETING HELD ON 03rd
February 2005

LIST OF PARTICIPANTS

1. Abrahamu Kaaya (Village Chairman)
2. Jorance N. Nassary (Chairman Kitongoji K/Moja)
3. Abrahamu Ole Senga (Village Committee member)
4. Samwel Mbiise
5. Unambawa Essau (Village Committee Member)
6. Emanuel L. Nnko
7. Sangito T. Kitumary
8. Sarikaely A. Kaaya
9. Saulo Essau Urio
10. Mwirj Lazaru Essau
11. Fida Elisesa
12. Elia Michaeli
13. Yohana E. Akyoo
14. Ataulfa Andreas
15. Akirwa Andrea
16. Kanangira Petro

OLKEREYANI RESIDENTS IN MOSHONO WARD ARUMERU DISTRICT MEETING HELD ON 04th
February 2005
LIST OF PARTICIPANTS

1. Robert Sikon 7. Maiko Lawasare
2. Ev. Gabriel Silas 8. Nassira Kaleku
3. Felix Sikon 9. Sangayoh Kaleku
4. Edward Sikon 10. Lazaro Luboo
5. Japhet Silas 11. Elnest Lesimango (VEO)
6. Onekwe Kiwelu

MLANGARINI RESIDENTS IN MLANGARINI WARD ARUMERU DISTRICT MEETING HELD ON 04th February 2005

LIST OF PARTICIPANTS

1. Ndossi N. E. - Public Relation Officer Gomba Estate
2. Solomon Tumaini - I/C Electrical L.F.D.A. Flowers
3. Rev. Patrick Maanda - A. G. T Church
4. Justin Molel - WEO - Mlangarini
5. George Molel - Chairperson Chekereni Hamlet
6. Peter Sakooni - Farmer
7. Michael Izraeli
8. John Izraeli
9. Ezekiel Izraeli
10. Paulo Izraeli
11. Ayahu Michaeli
12. Meagi Lotunu
13. Zephan Izraeli
14. Loningo Lemeitei
15. Junanne Juma
16. Geoffrey Lemeitei
17. Meshaki Lemeitei
18. Andrea Lemeitei
19. Boniface John
20. Fenieli Saikon
21. Oseya Lemeitei
22. Mitishile Mifia
23. Israel Lemeitei
24. Frank Lemeitei
25. Stephen John
26. Netuvaek Saikon
27. Anna Loi
28. Georjii Logidare
29. Evarist Logidare

KIKWE WARD RESIDENTS IN ARUMERU DISTRICT MEETING HELD ON 04th February 2005

LIST OF PARTICIPANTS

1. Julietta Moses
2. Adam Uri (Village Chairman)
3. William Kitomany (VEO)
4. Abasii Mohamadi
5. Peter Anaeli
6. Adamson Moses
7. Naomi Anaely
8. Keneldi Anaely
9. Jonathan Masinde
10. Felix Kasua
11. Philipo Afriwa
12. Omboi Kansya
13. Assery Njoke
14. Edward Mboya
15. Eliona Sibhaely
16. Anaely Ruben
17. Kamanya Elissa
18. Wilfredi Zakaria
19. Elibariki Asery
20. Wilson Lekweli
21. Gerson Polikarepo Mwaisha
22. Merry Erasto
23. Witness David
24. Moses Mbusse
25. Evarist Nkoh
26. Hamadi Juma
27. Merry Edumeni
28. Jeremia Kaaya
29. Afrasion Moses
30. Richard Jeremia
31. Ansosi Pallango
32. Elina Obodi
33. Woriafo Ndosiy
34. Paulo Maturo

BONDE LA MPUNGA RESIDENTS - MSASANI WARD - MEETING HELD ON 06th February 2005

LIST OF PARTICIPANTS

1. Godfrey Musi (Ag. WEO)
2. Soud Seif Soud
3. Teddys Ikusa (Julius Nyerere)
4. Veronica Igotao
5. Francesca Kajumulo
6. Diana Kajumulo
7. Bosco Kajumulo  
8. M. M. Hussein  
9. Mufadlal Haji  
10. Salima Nzani  
11. Eustadius Selestin  
12. C. B. S. Luumba  
13. Mwita M. Chogoro  
14. Elizabeth Lukunay  
15. Irene Temu  
16. Mariam Taibstantos  
17. Ramadhani Boy  
18. Abdul Hamisi  
19. Mary Wilson Chacha  
20. Rosemary Tseha Tenga  
21. Hanza Aziz  
22. Joseph Kahama  
23. Pius Kisaangali  
24. Veronica Igoke (Kinondoni Municipal Town Planner)  
25. Julius Shirungushela (Land Use Commission - MLHS)

CHARAMBWE WARD: NZASA AND KURASINI MJJ MPYA RESIDENTS - MEETING HELD ON 19th February 2005

LIST OF PARTICIPANTS

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mrisho Salum Matimbwa</td>
<td>Chairperson for NZasa A</td>
</tr>
<tr>
<td>2</td>
<td>Mwambi Mirongia</td>
<td>Chairperson for Kurasini MJJ MPya</td>
</tr>
<tr>
<td>3</td>
<td>Mohamed Omari Segea</td>
<td>Member for NZasa A</td>
</tr>
<tr>
<td>4</td>
<td>Mohamed K. Pongolani</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Islam Chinyanya</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Salum Abdullah Nyanga</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Sultan Ally Mganza</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Clement B. Mwambite</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Mabruki M. Lichaiwi</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Ali Kaisi</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Rashid Mesha</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Nuru M. Kaule</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Rashid Abdallah Mnemwa</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Shabani Abdtu Kimburaga</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Masudi Abdallah Nanga</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Muhamedy Musa Kambangwa</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Abdallah Ramadhani</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Ally Musa Njanike</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Issa Mohamed Libubulu</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Ahmad Musa Libubulu</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Hamisi Musa Mnuta</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Jafari Saidi Katundo</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Khalifa A. Mwaasha</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Salehe Nassoro Katundo</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Thabitii M. Mbegu</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Gaspar M. Mbugi</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Salum S. Mateenga</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Hassan Saidi Machela</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Yusuphu Moshi Mrawa</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Abdulaahamani M. Mnuru</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Selemani Mtitu Magandi</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Zainatu Ayunta</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Musa Kanyoli</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Ramadhani Nassoro Ngulangwa</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Zena Hukasta</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Paul P. Munishi</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Musa Hamisi</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Bakari Saidi Ndibale</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Sefu Saidi Ndibale</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Salum Bakari Njigale</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Saidi Hasani Hupunda</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Rashid Mohamed Habal Habali</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Ahamad Yahaya Bram</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Mashi Saidi</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Ashura Shabani</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Zahura Mpondi</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Salima Ally</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Mohamedl Mlanzi</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Zauidi Mohamed</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Zaitun Mohamed Mchili</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Hadiya Ismaili Msham</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Maiko Madullu</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Adrian Mbuyani</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Jackson Lyapu</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Mohamed M. Mmungoyo</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>Angelina Daudzi</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Salum Nassoro</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Juma Lileko</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Bashiri Juma</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Hamza Ally</td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Onani Selemani</td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Mohamed Kalyeyele</td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>Is Haamisi Isaa</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Esau Mlgo (Mpima Ardhi)</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>A. M. Sakia (Tony Garden Bar)</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Mbegu Nassoro Katundo</td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Zukeri Salehe</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Mohamedi Hassan Abdalla</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Ramani Nassoro Mpadula</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Juma Nassoro Mpadula</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Hana Masu</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>Hemedi Ally Selemari</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Selemani Mengi Lugomba</td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Abdali Sadi Mbendo</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>Yusuphu Habalalla Mbakakuli</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Hassani Huzi</td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>Saidi Mbwana Kitambuiro</td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>Julius Shirungushela</td>
<td></td>
</tr>
</tbody>
</table>

CHARAMBWE WARD: RANGI TATU RESIDENTS - MEETING HELD ON 20th February 2005
LIST OF PARTICIPANTS

1. Mohamede Saidi Chapyla
2. Saidi Selemani
3. Abdu Shego
4. Theophil Ngambeki
5. Rajabu Mzuzuri
6. Matayo Macha
7. J. Z. Ngolengo
8. Amini Malendeka
9. Ramadhani Mpili
10. Ely Ngolengo
11. Jumanne Ally
12. Amiri Ally
13. Fred Mushi
14. Ashumani Ally
15. Abdallah Rashidi Makolelo
16. Musa Thomas
17. Rajabu Omari
18. Simba W. Simba
19. Zena Abdallah
20. Zena Inza
21. Kulwa Hanna
22. Rehema Melito
23. Asia Mzee
24. Elizabeti Mushingo
25. Ally A Mgagi
26. Kibola Mustapha
27. Musa Abdallah
28. Mshamu Bakari
29. Rojaizi Abasi
30. Selemani Laimu
31. Zainabu Sebastian
32. Fatuma Mohamedi
33. Rehema Jumanne
34. Selemani Yusuphu Tengo
35. Juma Mpili
36. Iddi Omari Mkambaku - Chairperson Rangi Tatu Hamlet
37. Mrisho Juma - Member Rangi Tatu Hamlet
38. Hamidra Matali - Member Rangi Tatu Hamlet
39. Julius Shilungu Chifala (Land Use Commission - MLHS)
40. Athumani Simba - Member Rangi Tatu Hamlet
### Consultation with Government Authorities and TANESCO Regional Offices in Dar es Salaam project area

<table>
<thead>
<tr>
<th>Level</th>
<th>Stakeholders</th>
<th>Issues of Concern</th>
<th>Issues Analysis and Proposed Mitigation</th>
</tr>
</thead>
</table>
| NEMC                | Ester Kirario (Director of Environmental Impact Assessment) | - Courtesy call and information about the study.  
- She suggested that the valve study should start in line with the social study  
- The excises is going to be very sensitive since it touches people's properties livelihood. | Sensitization, open valuation process and ensuring fair and prompt compensation.                         |
| Ilala Municipal     | John Lubuva (Ilala Municipal Director) | - Courtesy call and information about the study.  
- He suggested the use of underground cable, which is the technology, used in modern days as the best option to avoid costs and disturbance of community members.  
- People will be disturbed  
- People should be assured about compensation | - Sensitization, open valuation process and ensuring fair and prompt compensation.  
- Exhaust all alternatives available to avoid mass relocation. |
|                     | Peter Bitwale (Municipal Planning and Coordination Officer) MPCO | - Moving people to the location attached to them with all social service available mainly schools for their children  
- People are established near to their jobs, and other social amenities  
- Kipawa residents are waiting their compensation from the Airport Authorities –  
- TANESCO has to be very specific about the compensation  
- The plots for the replacement to be prepared early  
- Consider public opinions which is environmentally friendly such as using underground cables | - Prepare RAP  
- Meet with TAA  
- Sensitization, open valuation process and ensuring fair and prompt compensation  
- Exhaust all alternatives available to avoid mass relocation. |
| Temeseke Municipal | Exaund Dumihi (Municipal Planning and Coordination Officer) MPCO (Town Planner) | - Courtesy call and information about the study.  
- He thinks the project will boost the development of Temeseke especially Kivukoni area by bringing more industries / factories and tourist hotels and attractions.  
- Also the project is potential economically and will encourage more investors in the new surveyed area  
- The Project will make the Temeseke Municipality expand towards south-east where they are facing a serious shortage of electricity.  
- People should be compensated  
- Farmers will loose their land.  
- People will be disturbed  
- People to be provided with plots with social services, like schools, transport etc. in hand. | - Prepare acceptable RAP  
- Implement the project  
- Sensitization, open valuation process and ensuring fair and prompt compensation  
- Exhaust all alternatives available to avoid mass relocation. |
| Kinondoni Municipal | Edgar H Berege (Municipal Director) | - Courtesy call and information about the study.  
- He suggested that the local leaders should attend the meetings with affected residents. | - Involve the local leaders in every step of the project. |
| TANESCO Ilala Region | Kaali Ephraim (Ag. Regional Manager) | - Courtesy call and information about the study.  
- After the compensation usually no monitoring to see the impact of the project to the affected people | - Need to change the altitude  
- Prepare monitoring programs |
| TANESCO Temeseke   | Nsajigwa J. Mwaikisa | - Courtesy call and information about the study.  
- Kurasini route is very expensive area due to the | - Sensitization, open valuation |
<table>
<thead>
<tr>
<th>Level</th>
<th>Stakeholders</th>
<th>Issues of Concern</th>
<th>Issues Analysis and Proposed Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td>(Regional Manager)</td>
<td>congestion of houses</td>
<td>process and ensuring fair and prompt compensation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lack of cooperation with Land planers when it comes to expansion of the city to their stakeholders</td>
<td>- Exhaust all alternatives available to avoid mass relocation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Experience of low voltage in the area</td>
<td>- Land Planners should involve all stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- People might not cooperate during the compensation</td>
<td></td>
</tr>
<tr>
<td>TANESCO</td>
<td>Eva Fumbuka (Regional</td>
<td>- Courtesy call and information about the study.</td>
<td>- Sensitization, open valuation process and ensuring fair and prompt compensation</td>
</tr>
<tr>
<td>Kinondoni</td>
<td>Manager)</td>
<td>- Malakaa is a complex area and is going to be expensive</td>
<td>- Exhaust all alternatives available to avoid mass relocation</td>
</tr>
<tr>
<td>North</td>
<td></td>
<td>- Policy state affected people should be compensated</td>
<td></td>
</tr>
</tbody>
</table>
Distribution and Transmission Rehabilitation Project
Environmental and Social Impact Assessment (ESIA) and Resettlement
Action Plan (RAP)

Terms of Reference (TOR)

Background
TANESCO and the International Development Association are preparing a distribution rehabilitation project component as part of the Songo Songo Gas Development and Power Generation Project (Credit 3569-TA). This component aims to improve the reliability and the quality of power supply to the consumer. The project will achieve the following objectives:
- Reducing the duration and frequency of power interruptions
- Improving voltage conditions at consumers’ premises
- Reduction of power system losses

The proposed project will consist of the following project components:
1. Construction of a 7 km 132kV transmission line from Ubungo Main substation to a New Oysterbay bay substation. The new Oysterbay substation will be located in the premises of TANESCO’s Regional Office Mikocheni
2. Construction of about 10 km 132kV transmission line from Ilala Substation to New Kurasini Substation
3. Construction of about 12 km 132kV transmission line from new Kurasini Substation to a New Mbagala substation
4. Construction of about 10 km 132kV transmission line from New Mbagala Substation to Yombo substation. New Yombo substation will be located at TANESCO’s plot already acquired
5. Construction of about 7 km 132kV transmission line from New Yombo substation to an existing Factory Zone III substation at Kipawa
6. Construction of about 80 km 132kV transmission line from Kiyungi substation at Moshi to Njiro substation at Arusha
7. Construction of eight 33/11kV new substations at Muhimbili, Temeke, Tanzania Oxygen Limited (TOL), Kinondoni, Kawe, Oysterbay, University of Dar es Salaam and Kurasini

Item 1-4 above will include supply and installation of 2x50MVA 132/33kV transformers complete with 3x132 kV 1500 MVA circuit breakers and 8x33kV 500MVA breakers and

---

1 See the attached Maps showing these proposed transmission lines

Page 1 of 6
33kV line gantries and busbars, control and protection with a switchboard rooms at New Oysterbay, New Kurasini, New Mbagala and Yombo substations.

**Objectives of the TOR**
The objective of this TOR is to assist a project proponent or consultant to carry out a comprehensive Environmental and Social Economic Impact Assessment (EIA) and prepare a Resettlement Action Plan as per country laws and the World Bank requirement as well as bringing more project benefits to the society.

**Guiding Principles**
The project proponent or consultant will prepare an EIA and a Resettlement Action plan to the World Bank policy standards and according to the existing Tanzanian laws, regulations and guidelines. The EIA and RAP will be prepared in accordance with and be fully responsive to IDA’s “safeguard” operational policies, notably OP 4.01 (Environmental Assessment), OP 4.04 (Natural Habitat) OP 4.11 (Cultural property) and OP 4.12 (Involuntary Resettlement)\(^2\), Land Act (1999), NEMC’s Environmental Impact Assessment guidelines (2002) and other relevant applicable laws and policies.

**Scope of Work**
The Environmental Impact Assessment and Social Economic Impact Assessment will focus on new facilities to be financed under the project. The tasks include the following:

- Review of Tanzania’s relevant existing and pending environmental legislation, land acquisition legislation and any other relevant legislation pertaining to this project
- Review the relevant World Bank policies (OP 4.01 and OP 4.12) and guidelines including the pollution Prevention and Abatement Handbook (Electric Power Transmission and Distribution)
- Meetings and consultations with TANESCO’s facility management and relevant staff in respective regions, relevant government and municipal/town authorities, environmental experts, project’s affected people and other bodies deemed necessary. The Public Consultation should be a separate chapter in the EA report, while minutes of the public consultation meetings need to be presented in an Annex (when were meetings held, who attended, major concerns, how addressed in documentation, etc.)
- Establish an appropriate baseline for environmental, socio - economic, health and safety issues
- To identify potential impacts of the project on aspects of the environment (social, biological, physical, health and safety)
- Prepare an analysis of alternatives (consideration of alternatives) e.g. various routes considered for the new transmission line, different design (e.g. underground cables, compact design) and including the no project alternative and provide a brief cost and benefit analysis. The selected route should take economic, technical, social and environmental parameters into consideration (propose and fully justify optimal choices that would minimize or avoid potential impacts)

\(^2\)These policies are found at the World Bank website, [www.worldbank.org](http://www.worldbank.org)
To design an environmental and social management plan (ESMP) to address and mitigate impacts that cannot be avoided. The ESMP should describe in detail the mitigation measures to be carried out, the costing, monitoring process, scheduling and organizational capacity required to implement such measures.

To identify measures for environmental enhancement and sustainability that may be desirable to be put into place.

To identify any social and environmental management capacity building and institutional strengthening support that may be required within or outside TANESCO for the departments or institutions involved in the project.

To prepare a Resettlement Action Plan (RAP) following the identification of the need for land acquisition, displacement of families or businesses (including squatters), compensation for crops or other income-generating assets and loss of access to income-producing resources.

**Reporting Requirements**
The draft Environmental Impact Assessment report should be prepared within 10 weeks from the commencement date (i.e. receiving the approved ToR from NEMC). The draft report shall be submitted to NEMC and the World Bank for review and comments. The comments shall be received within 6 weeks from the date when the draft reports were submitted. The final report, which includes the comments from NEMC and the World Bank, should be finished after one week from the date when the final comments are received. The report should be written in English, and should include an Executive Summary and should contain relevant maps. The final draft report will be final only after the acceptance and approval by the Government of Tanzania (NEMC) and the World Bank.

**Environmental Assessment and Social and Resettlement Team Skills**
Environmental and social assessment specialists/consultants should have sufficient and relevant competence in preparing environmental impact assessments. The environmental team should possess the necessary assessment skills as well as in depth knowledge of the environmental aspects of the electricity and water sectors. The team should also include at least one social scientist with at least 10 years of experience in the preparation of resettlement action plans, Property Valuers as well necessary numerator.

**Budget and Timetable**
This assignment should be accomplished within 6 weeks after the acceptance of the ToR and mobilization of the consultants.

---

3 The requirement of Resettlement Action Plan report is detailed in attachment 1
ATTACHMENT 1

RESETTLEMENT ACTION PLAN

Report Requirement

The resettlement action plan (RAP) is the instrument by which people, who lose land, physical assets, or rights of access to resources necessary for their income, whether temporarily or permanently, are compensated for their losses and afforded realistic opportunities to increase or at least to restore their incomes and standards of living. It includes both the background information and analyses necessary for designing an action plan to achieve these goals and the action plan itself. RAP report will include the following sections:

I. PROJECT INTRODUCTION. This will provide the project description and the overall context and justification for the project. In particular, it will describe each part of the project "footprint," that is, each separate facility, or construction site, including any access roads, quarries or borrow sites, work camp areas, or any other location needed for the project, whether temporary or permanent.

II. MEASURES TO MINIMIZE LAND ACQUISITION AND LOSSES. This section is the "alternatives analysis" for the resettlement plan. It will set out any alternatives that were considered that would reduce or eliminate social impacts, and show how the alternatives chosen minimize the acquisition of property and other assets that people will suffer.

III. LEGAL BACKGROUND. This section will review the national legal background to land taking and resettlement, and current practices, including any standard organizational frameworks that are relevant to this sector or project. It will compare laws, entitlements, eligibility and practices of the government with those required under the World Bank Operational Policy on Involuntary Resettlement. It will review any gaps perceived between the national policies and those of the Bank, and it will show how both national and Bank policies can be implemented within the project. It will recommend resolution methods for any contradictions that may be seen to be significant.

IV. CENSUS AND SOCIAL-ECONOMIC SURVEYS. This section will provide the results of ethnographic information, enumerations and socio-economic surveys carried out to establish the baseline data against which both impacts and the eventual adequacy of compensation, and recovery of incomes and restoration of living standards and improvement, can be measured.

V. PROJECT IMPACTS. This section will describe the types and durations of project activities during both construction and operation, and will specify the
types, seriousness of potential positive, negative and cumulative impacts on the affected people, at each site of project activities.

VI. RESETTLEMENT POLICIES AND ENTITLEDMENTS. Here the policies to be applied on two major issues will be set out. A section on eligibility will discuss what types of people will or will not qualify for measures under the project. It will discuss the "cut-off date" set up, after which new arrivals in the project area will be deemed not to be eligible for project benefits. A section on entitlements will describe possibly different types of compensation based on market value and replacement cost for loss of assets. A matrix format, showing people and forms of compensation, will summarize the eligibility and types of compensation that will be included in the implementation plan. A section on how inventories of losses will be done, and how assets lost will be evaluated, will also be included, establishing a system of valuation and compensation with World Bank procedures, policies and standards.

VII. RESTORATION OF INCOMES AND STANDARDS OF LIVING. This section will demonstrate how the policies to be applied, and the resettlement and other compensatory measures to be implemented, will meet the objective of the plan and the policy. If such measures include any plans to provide training, investment resources, outreach programs, or other special activities as means toward restoring incomes and standards of living, they will be described in this section. The plans to provide alternative sites and/or house construction will also be in this section.

VIII. INSTITUTIONAL ARRANGEMENTS. This section will include descriptions of the organizations and interaction by which the resettlement plan will be carried out. It will fully describe the process by which implementation will take place.

IX. PUBLIC CONSULTATION AND PARTICIPATION. This section will show how affected people have been consulted in the overall process of planning for their displacement, resettlement and restoration of sustainable livelihood and how they will participate in the future to improve their life. It will describe any committees or other bodies in which they have participated or will participate. Communication strategy should be developed as part of methodology. An annex will give the details of consultations held before and during RAP planning, including dates of meetings and attendance at each. It will demonstrate that people were fully involved and understood the actions that would be taken during implementation.

X. COMPLAINTS AND GRIEVANCES. This part will describe mechanisms, at institutional and community level by which people can register objections to activities undertaken during the planning and implementation of the project,
and the mechanisms for redressing grievances. It will show how these actions will be accessible to ordinary affected people, and will ensure a process that is fair and equitable, with an option for recourse to formal judicial systems if project mechanisms fail.

XI. MONITORING AND EVALUATION. Set out the plans for monitoring performance of the Resettlement Action Plan and evaluating its effectiveness. Name the institutions, which will be involved in this process.

XII. BUDGET. Give a detailed budget for the implementation of the resettlement activities, with notes on the control and flow of funds. Identify the sources of different categories of funds, as the World Bank cannot pay for land or for cash transfers, including compensation.

XIII. TIMETABLE. Using standard formats, set out the timetable for resettlement implementation. Show how it is integrated into the timetable of physical works, so that no one loses assets or is forced to move before he or she has been compensated and, if relevant, is able to move to the permanent new site.

XIV. ANNEXES. Possible annexes may include those on: legal review (law by law); detailed description of the occupation of lands traversed and to be affected;; statistics on those affected; inventories of losses, or templates for inventories to be carried out later; statistics on temporary land occupation; statistics on permanent land acquisition; affected structures; the record of consultation meetings; a list of reports and people seen or involved in the preparation of the RAP; and a map of the sites involved and the project area.

XV. Review and agreement on inception report and methodology.