

CHAPTER 9

ENVIRONMENT

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9.1 Environmental Consideration in Tanzania

9.1.1 Environmental Administration and Legislation

(1) Environmental legislation

Tanzania has "National Environmental Policy" (see 9.1.2).

Although there is no specific environmental law, the individual ministries have established environment-related laws, including the ones shown below.

- Law relating to forests and wildlife: Ministry of Natural Resources and Tourism
- Law relating to water pollution: Ministry of Water and Livestock Development
- Law relating to food safety: Ministry of Agriculture and Food Safety

(2) Environmental administration

The Tanzanian government does not have a ministry responsible for environmental legislation; however, the President has appointed a minister who is in charge of the environment.

The minister exercises general control over two organizations responsible for environmental administration under the Vice President's Office. These are the Department of Environment and the National Environment Management Council (NEMC).

(a) Department of Environment

- The Department of Environment was separated from the Ministry of Natural Resources, Tourism and Environment and moved to the Vice President's Office in 1995.
- As a government agency equivalent to a ministry, the Department of Environment decides on environmental policies, provides technical advice on environmental issues, and coordinates environmental programs prepared by various government agencies.
- The Department of Environment has a staff of about 40 persons.

(b) National Environment Management Council

- The National Environment Management Council (NEMC) was installed in 1983.
- As an advisory organ on environmental issues, NEMC decides on technical matters involved in reinforcement of pollution control and implementation of environmental impact assessment (EIA).
- NEMC has a staff of about 80 persons.

(3) Local governments and local environmental regulations

In Tanzania, the local governments are hierarchized into regional, district, and municipal governments under the central government.

Each of the local governments is authorized to establish environmental regulations in compliance with the environment-related laws.

The contents of local environmental regulations vary from one locality to another.

9.1.2 Environmental Policy and Relevant Conventions

(1) Environmental policy

“National Environmental Action Plan” was formulated in 1994, and “National Environmental Policy” was established in 1997.

The National Environmental Policy points out six major problems. These are:

- (a) **Soil deterioration**
- (b) **Shortage of good-quality water available to urban and rural inhabitants**
- (c) **Environmental pollution**
- (d) **Loss of wildlife and biological diversity**
- (e) **Degradation of aquatic systems**
- (f) **Deforestation**

The main purpose of the National Environmental Policy in connection with electric power is to prevent environmental deterioration through thoroughgoing control of the environmental impact from the development and use of electric energy. The policy objectives are as follows.

- (a) **Reducing firewood consumption through development of alternative energy sources and using firewood energy efficiently**
- (b) **Promoting the development of renewable energy**
- (c) **Implementing assessment and control of development and use of energy**
- (d) **Improving energy efficiency and saving energy.**

(2) Environmental conventions

The present status of the Tanzanian government’s ratification and signing of the major international conventions on the environment is as follows.

(a) **UN Framework Convention on Climate Change (adopted in May 1992)**

Tanzania signed the convention on June 12, 1992 and ratified it on March 1, 1996.

(b) **Convention on the Protection of World Heritage (adopted in 1972)**

Tanzania approved the convention on November 20, 1987.

The following five places in Tanzania have been registered as world heritage.

- Selous Wildlife Sanctuary
- Kilimanjaro National Park
- Ngorongoro Nature Conservation Area
- Kilwa Kisiwani Island and Songo Mnara Island
- Serengeti National Park

(c) **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (adopted in 1973)**

Tanzania ratified the convention on November 29, 1979.

(d) **UN Convention on the Law of the Sea (adopted in 1958)**

Tanzania ratified the convention on September 30, 1985.

(e) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (adopted in 1989)

Tanzania ratified the convention on April 7, 1993.

9.1.3 Wildlife Protection

(1) One quarter of the land of Tanzania is dedicated to national parks, game reserves, and no-hunting areas.

(a) National parks and wildlife conservation area

The national parks play an important role in the conservation of biological diversity. People are permitted to enter them only when they meet specified conditions (e.g., for religious, educational, or recreational purposes). The organization named "Tanzania National Parks," founded in 1959, manages 12 national parks—Arusha, Gombe, Katavi, Kilimanjaro, Lake Manyara, Mahale, Mikumi, Ruaha, Rubondo, Serengeti, Tarangire, and Udzungwa.

There is only one wildlife conservation area—Ngorongoro. This is to maintain balance between the interests and rights of the pastoral Masai, the conservation of natural resources, and the promotion of tourism.

(b) Game reserves and wildlife sanctuaries

There are more than 15 game reserves and wildlife sanctuaries.

The game reserves are controlled by the Department of Wildlife Protection with the assistance of the heads of the regional directorates.

The game reserves have been established to protect the animals and plants living there. Only licensed persons are permitted to enter the game reserves for hunting during the period from July to December.

(c) Restricted areas

About 50 to 60 restricted areas are controlled by the Department of Wildlife Protection with the assistance of the heads of the regional directorates.

In these areas, licensed persons are permitted to hunt for animals and plants other than those of specified species.

(d) Forest reserves

There are forest reserves throughout the country. They are controlled by the Department of Forestry. With the permission of the Department of Forestry or the Department of Wildlife Protection, people can cut trees and hunt for animals in forest reserves.

(2) Protection of wild fauna and flora

(a) Article 389 of Chapter 15 of the Forest Law stipulates that no person is allowed to do any of the following acts in any of the forest reserves without permission or legal authority vested by the Law:

- Cutting, removing, occupying, burning, or otherwise causing damage to forest products
- Cutting trees for land development or any other purpose, cultivating crop, or

- plowing land
- Constructing or re-opening a tunnel or workplace
- Occupying or living on land
- Erecting a building, hut, cattle enclosure, etc.

(b) Environmental consideration should be given to the “endangered species of wild fauna and flora” that are specified in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and classed into three categories in the Red Data Book.

This is especially important for Category 1 species, such as the elephant, crocodile, cheetah, leopard, and rhinoceros.

9.1.4 National Cultural Assets

By definition, the term “cultural assets” includes assets having historic, social, and cultural values. The National Culture Policy emphasizes that all historic relics and cultural assets should be preserved to promote education and tourism.

At present, 118 of the 400 sites that are preserved in accordance with the current legislation are recorded in the official gazette.

9.1.5 Environmental Standards

The major national-level environmental standards for electric power facilities are as follows.

Each of the local governments is required to establish its own environmental regulations. Therefore, the contents of environmental regulations vary from one locality to another.

(1) Electric shock

- The amount of electric current that passes through the human body shall not exceed 2 mA and the duration of the current shall not exceed 60 seconds.
- Ground resistance shall not be greater than 10 ohms.

(2) Noise

- The level of 8-hour noise measured in the ordinary working environment shall not exceed 85 dB. When earplugs are used, the level of noise may be up to 100 dB.

(3) Vibration

- There are no regulations.

(4) Pollution of water resources

- Water is divided into three classes: Class 1 is drinking water, Class 2 is water for feeding cattle and fish, and Class 3 is irrigation/industrial water.
- For each class of water, maximum permissible concentrations of impurities have been specified.

(5) Land utilization

- In each region, the uses of land have been specified and regulated (e.g., industrial area and residential area).

9.1.6 Environmental Impact Assessment (EIA)

(1) EIA procedure

- As the draft of Environment Act is being discussed by the government agencies concerned a draft EIA procedure has already been prepared, but the draft EIA has not been officially approved to date.
- Nevertheless, the draft EIA procedure is already in use, practically.
- A list of projects in which EIA is mandatory is attached to the draft EIA procedure. A number of projects of the energy industry are also included in the list.
- In compliance with the draft EIA procedure, TANESCO has already carried out EIA for these projects: Kihansi Hydroelectric Generation, Songo Songo Natural Gas Thermal Power Generation, Pangani Hydroelectric Redevelopment, and Zambia-Tanzania Power Transmission Line.
- The EIA procedure as described in the above draft shall be explained below.

(2) Purpose of EIA

- EIA is an official investigation of a proposed project made prior to execution of the project in order to predict the effects of the project on the environment.
- The purpose of EIA is to predict environmental problems involved in the project in question and assess the merits and demerits of the project and thereby to ensure that the problems are solved early in the planning and design stages of the project.
- EIA represents “environmentally permissible prerequisites,” and the issuance of a permit or license for development is subject to “environmental approval” of the National Environment Management Council (NEMC).

(3) EIA procedure

- The EIA procedure consists mainly of the following steps: Registration, screening, impact assessment, review approval, project execution, monitoring, auditing, and completion.
- The main persons involved in EIA are as follows:
 - Person who executes (proposes) the project
 - Person who implements the EIA (consultant)
 - Person who evaluates the merits and demerits of the proposed project and suggests a final decision
 - Interested persons who are affected directly and indirectly by the project (project undertaking group and interested group)

(4) EIA procedural flow

(a) Registration

- The person who proposes a project registers the content or outline of the project with NEMC.
- The criteria by which to examine the project and decide the level of EIA are as follows:
 - Status of environmental approval in the project area
 - Potential effects of the proposed project and reliability of predicted environmental impact
 - Environmental change brought by execution of the project

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- EIA technique used
- Presence or absence of any plan, policy, or procedure which can affect the use of land
- Public interests (concern of the general public)
- Any other important factors involved in the project

- Potential effects on the environment include the following:

- Effect on topography, soil stability, and landscape
- Effect on wastewater and water quality (surface water and ground water)
- Effect on the biota
- Effect on the access and transportation systems
- Effect on the existing public services, including electricity, water, and telephone
- Effect on the existing community facilities
- Effect on the existing plans to ensure safety and provide against emergencies
- Effect of gas, soot and dust, noise, and heat radiation
- Effect on management of the use of adjoining areas, including conservation and cultivation
- Effect of construction work and management
- Visual effect
- Social effect

(b) Screening

- Screening consists in classifying the proposed project to decide the level of EIA to be implemented.
- The level of EIA is decided by NEMC. Where necessary, NEMC consults the Technical Review Committee (TRC) that is an interdepartmental organization.
- The level of EIA is one of the following:
Full EIA required/Preliminary assessment required/EIA not required/Project rejected
- A screening report shall be prepared within 30 days after registration of the proposed project with NEMC.
- The EIA procedure to be followed when the EIA level is "full EIA required" is described in detail below.

(c) Implementation of EIA

- In order to clearly identify the major problems involved in the project, the person who proposes the project shall define the scope of the project in consultation with NEMC and with the Environmental Units (EUs) installed in the legislative departments concerned and interested parties.
- The Terms of Reference (TOR) for the EIA provide the person in charge of EIA with formal information about the problems to be solved during the EIA. The result of review of the proposed TOR shall be notified to the person who proposes the project within 30 days after receipt of the proposed TOR.
- The EIA is implemented by the person who proposes the project. The main EIA items are stated in the TOR. All information that is collected during the EIA needs to be included in "Environmental Impact Statement" (EIS).

(d) Review

- The person who proposes the project submits a draft EIS to NEMC for review. The Technical Review Committee (TRC) shall help NEMC review the draft EIS. Copies

of the draft EIS shall be submitted to the appropriate councils of the region, district, and municipality. NEMC shall make the draft EIS public for 21 days to invite opinions of the general public.

- Where necessary, NEMC shall hold a public hearing.

(e) Environmental decision

- The result of the EIS review is either "Approved" or "Disapproved."
- If the draft EIS is approved, NEMC shall issue a Provisional Environmental Permit (PEP) which is effective for two years.

(f) Monitoring

- In executing the project, the person who proposes the project shall implement a monitoring program which includes the conditions for permit. NEMC audits the implementation of the said program.

(g) Completion

- At the end of the project, the person who has carried out the project shall submit a Project Completion Report to NEMC.

9.1.7 Land Ownership System and Compensation

In Tanzania, all the land is public land. However, plots of land are allotted to individuals and institutions by the Ministry of Land, Housing, and Urban Development and the local governments.

Each land holder pays rent to the local government every year and is supposed to enhance the value of the land.

The acquisition of a plot of land is approved as long as the land is used for a building, including electrical equipment, or crop production.

A new land holder must compensate the former land holder for the land and property thereon.

- The unit amount of compensation for land and property thereon is decided by a certified appraiser.
- The unit amount of compensation for each type of crop has been set by the Ministry of Agriculture. It is subject to approval of the Parliament.

The compensation procedure is as follows:

- (1) The new land holder gives the former land holder an explanation about the compensation.
- (2) The new land holder compensates the former land holder.
- (3) The new land holder applies for change of the title to the land.

If the land is in an urban area, the application shall be submitted to the appropriate city authority or council.

If the land is in a rural area, the application shall be submitted to the Ministry of Land, Housing, and Urban Development.

9.1.8 Environment-Related Section of TANESCO

At TANESCO, the following section is in charge of environmental issues and land acquisition/compensation.

- It is the Research and Development Section that takes charge of environmental issues.
- The senior surveyor is in charge of land acquisition/compensation, including field investigation, assessment of project site, coordination of the parties concerned, and payment of compensation to the former owner of a house/property.

9.2 Environmental Consideration Regard to the Project

9.2.1 Policy on Study of Environmental Considerations

(1) Technique to study environmental considerations

In Tanzania, a draft environmental impact assessment procedure (hereinafter referred to as the Draft EIA Procedure) has already been prepared. This draft specifies projects for which EIA is mandatory. Projects of the energy industry are also included in them. This "Master Plan Study on the Power Sector for Major Towns in the United Republic of Tanzania" concerns power distribution, substation and transmission facilities. Therefore, we shall discuss below the environmental considerations for the projects that have been selected as "priority projects" referring to the procedure stated in the Draft EIA Procedure.

(2) Flow of study of environmental considerations

The present study focuses on the following:

- Potential environmental problems in the stages of construction and operation
- Measures to deal with their effects

Referring to the EIA procedure stated in the Draft EIA Procedure, we shall carry out the study in the following sequence:

- [A] Project overview
- [B] Level of EIA
- [C] Study of latent effects
- [E] Compilation of results of EIA
- [F] Follow-up

(3) Study items

(a) Project overview

The following matters shall be described.

- (i) Contents of work
- (ii) Project site
- (iii) Infrastructure and utilization thereof
- (iv) Impact on the environment
- (v) Other environmental problems
- (vi) Means to reduce environmental impact and improve the environment

This item corresponds to the project registration stated in the Draft EIA Procedure.

(b) Level of EIA

- With consideration given to the contents of the present project, a comprehensive EIA shall be implemented.
- This item corresponds to the screening stated in the Draft EIA Procedure.

The criteria for reviewing the project and deciding the level of EIA are as follows:

- (i) Environmental characteristics of project site
- (ii) Potential effects of proposed project and reliability of predicted environmental impact
- (iii) Environmental resilience to changes
- (iv) EIA technique used
- (v) Plans, policies, or procedures which affect the use of land
- (vi) Public interests (concern of the general public)
- (vii) Other factors involved in the project

There is some possibility that the following potential impacts on the environment may be involved in the project.

- (i) Effects on topography, soil stability, and landscape
- (ii) Effects on wastewater and water quality (surface water and ground water)
- (iii) Effect on the biota (animals and plants)
- (iv) Effects on access/transportation systems
- (v) Effects on existing public services, including electricity, water supply, and telephone
- (vi) Effects on existing community facilities
- (vii) Effects on existing plans to ensure safety and provide against emergencies
- (viii) Effects of gas, soot and dust, noise, and heat radiation
- (ix) Control of solid/liquid waste and flooding in stormy weather
- (x) Control of the uses of adjoining areas, including nature conservation areas and health resorts
- (xi) Visual effect (Aviation Act, etc.)
- (xii) Social effect (cultural assets, etc.)

(c) Study of latent effects

The following potential effects should be studied. This item corresponds to the scoping and TOR/EIA implementation stated in the Draft EIA Procedure.

(i) Electric shock

It is necessary to study the possibility of an electric shock by electrostatic and electromagnetic induction from electrical equipment. To eliminate the possibility, the following measures should be taken.

- Substations shall be so constructed as to prevent entry of unauthorized persons.
- Transmission lines shall be sufficiently high above the ground.

(ii) Noise

It is necessary to study the noise from transformers and electric cables, as well as the low-frequency, air-borne noise.

In view of the above noises, suitable measures should be taken (e.g., installing a transformer sufficiently away from the local community).

During the period of installation of electrical equipment, the applicable noise regulations must be observed at the workplace.

(iii) Water pollution

The quality of water, especially drinking water, must be examined. It is necessary to take suitable measures to conserve the water resources and prevent the entry of wastewater into drinking water.

(iv) Nature conservation

If it is necessary to fell trees or enter nature conservation/protection areas in order to secure a passage under a transmission line or construct a transmission line, its effects on nature of the locality must be studied.

In addition, all the measures required by the ordinances of the local governments and by international conventions (e.g., obtaining necessary permits and preventing landslides due to soil deterioration or heavy rain) must be implemented.

(v) National cultural assets

Concerning national heritage and cultural assets specified in the National Culture Policy, consideration should be given to preventing them from being destroyed by some development project.

If a site containing such valuable assets is indispensable as a project site, it is necessary to take every possible measure to protect its environment, including alteration of the construction process and revision of the budget.

(vi) Land utilization

With due consideration given to the land uses specified by the local government, studies must be made for optimum location and design of electrical facilities, such as transmission lines and substations.

(vii) Landscape and topography

If a transmission line is routed through a tourist resort, it is necessary to study its effects on the landscape and topography of the locality and take suitable measures to prevent adverse effects.

(viii) Existing infrastructure

It is necessary to study if a transmission line does not obstruct the passage of a microwave transmission line, road crossing, or river crossing and if it does not cause disturbance in reception of radio, TV, or portable phone. If it does, necessary measures must be taken.

(4) Priority projects requiring environmental consideration

The priority projects that require the environmental consideration are selected as follows.

(A) Dar es Salaam

A1: Installation of New Oysterbay S/S

A2: Modification of Ubungo S/S

A3: Construction of new 132 kV transmission line between Ubungo S/S and New Oysterbay S/S

(B) Moshi

B1: Renewal of Kiyungi S/S equipment

B2: Expansion of Boma Mbuzi S/S equipment

B3: Expansion of Trade School S/S

- B4: Renewal of Same S/S equipment
- (C) Arusha
 - Expansion of Njiro S/S main transformer

9.2.2 Results of Environmental Impact Assessment

(1) Summary of results of environmental impact assessment

All information collected during the environmental impact assessment (EIA) has been compiled into an Environmental Impact Statement (EIS). The EIS contains the following matters. This item corresponds to the EIS stated in the Draft EIA Procedure.

- Outline and content of baseline
- Status of progress of proposed matters
- Identification and prediction of potential effects
- Consideration for and opinions about easing of effects
- Environmental management plan

(a) Outline of study results of priority projects

The Team selected some typical projects included in expansion plan for the model study of environmental issue of the master plan study. The criteria of the selection is urgent and/or potential of environmental impact. Projects not selected but proposed also seems to have some environmental impact, however, problems shall be minimized with feasible mitigation measures. The results of studies for the priority projects are outlined below. For a detailed description of the study results, see the attached tables.

(A) Dar es Salaam

The study results for the three projects in Dar es Salaam are summarized below.

A1: Installation of New Oysterbay S/S

- Project outline: This project is intended to construct a new substation on TANESCO's ground that adjoins its Kinondoni North Branch northeast of Dar es Salaam and install 132/33 kV 45 MVA x 2, 33/11 kV 15 MVA x 2, 33 kV feeder x 4 and 11 kV feeder x 5 in the new substation.
- EIA results:
 - TANESCO has already acquired the land adjoining its Kinondoni North Branch as the project site. The acquired land has sufficient space for the project.
 - The project site has already been leveled and is free of geologic/topographic problems.
 - The site is situated in a developed area which contains neither a wildlife protection zone nor a cultural asset protection zone.
 - The site is enclosed by a fence. It adjoins a public road on one side and a wide vacant lot on two sides. Since there are no residential houses in the neighborhood, the project site is free of landscape problems and the project will not have any adverse effects on the existing communities or infrastructure.
 - Since the substation to be constructed is new, it produces no wastewater, gas, soot and dust, heat, or waste. In addition, since there are no residential houses in the neighborhood, the noise produced by the substation will not pose any difficult problem.
 - The public road running along one side of the project site provides for easy access

of construction workers and smooth transportation of construction materials.

A2: Modification of Ubungo S/S

- Project outline: Expansion of 132 kV outgoing transmission line
- EIA results:
 - Since the project is intended to install additional equipment on the existing ground of Ubungo S/S, there is no need to acquire an extra plot of land. The site is level and sufficiently wide for the project, and the project will pose no problems of geology, topography, landscape, or land acquisition.
 - The project site is situated in a developed area which contains neither a wildlife protection zone nor a cultural assets protection zone.
 - The site is enclosed by a fence. It faces a public road on two sides and a factory zone on the other two sides. Since there are no residential houses in the neighborhood, it is very unlikely that the project will have adverse effects on the existing communities or infrastructure.
 - Since the project is expansion of outgoing transmission line equipment, it produces no wastewater, gas, soot and dust, heat, or waste. In addition, since there are no residential houses in the neighborhood, the noise produced at the construction site will not pose any difficult problem.
 - The public road running along two sides of the project site provides for easy access of construction workers and smooth transportation of construction materials.
 - The existing substation is surrounded by a wall to protect the equipment. In addition, guards are posted on the grounds.

A3: Construction of new 132 kV transmission line between Ubungo S/S and New Oysterbay S/S

- Project outline: Installation of a new 132 kV transmission line about 8.5 km in length between the two substations.
- EIA results:
 - As mentioned above, the Ubungo S/S has already been established, hence there is no need to acquire an extra plot of land for the project. In addition, the site for the New Oysterbay S/S has already been secured. Both sites are level and free of geologic problems.
 - As the site for each of the steel towers for the transmission line, it is necessary to select a place which is topographically stable. It is also necessary to make proper compensation for the steel tower sites and the land under the transmission line.
 - The transmission line is planned to be routed through a suburb of Dar es Salaam. It is very unlikely that the suburb contains a wildlife protection area and/or a natural asset protection area.
 - Since construction of the steel towers for the transmission line will change the landscape of the locality, it is to be desired that due consideration should be given to the local landscape and existing communities (e.g., bypassing residential areas, community facilities, health resorts, etc. as far as possible).
 - Where installation of airplane warning lights, etc. is required by the Aviation Act, etc., it is necessary to take suitable measures.
 - Construction of the transmission line does not produce wastewater, gas, soot and dust, heat, or waste. When a strong wind is blowing, however, there is the

- possibility that the local inhabitants may be annoyed by a hissing sound.
- In order to prevent electrostatic and electromagnetic induction, it is necessary to secure a sufficient clearance between the ground and the transmission line as required by Tanzania's standards.
 - If the transmission line is to be constructed across a road or river, it is necessary to make sure that construction of the transmission line does not interfere with the road traffic or river flow.
 - If there are military installations along the route of the transmission line, it is necessary to have thoroughgoing talks with the parties concerned before starting the construction work and obtain permits, etc. required.
 - If there is a complaint about radio disturbance which is apparently ascribable to construction of the transmission line, it is to be desired to discuss corrective measures (e.g., adjusting the antenna).
 - In constructing the transmission line, consideration should be given to the following:

Use care not to interfere with the road traffic during access to the construction site and transportation of construction materials.

In order to carry out the work smoothly, secure grounds for temporary works, such as yards for temporary storage of construction materials and heavy construction machines.

(B) Moshi

The study results for the four projects in Moshi are summarized below.

B1: Renewal of Kiyungi S/S equipment

- Project outline: Renewal of 33 kV feeder protection (8 units)
- EIA results:
 - Since this project involves expansion of equipment within the grounds of an existing substation, there is no need to acquire an extra plot of land. The site has sufficient space for the project and has already been leveled. It has no problems of landscape, land acquisition, and geologic/topographic stability.
 - The project site is in a developed area, which contains neither a wildlife protection zone nor a cultural asset protection zone.
 - Since there are no residential houses/communities in the neighborhood of the existing substation, it is unlikely that the project will have adverse effects on the existing communities or infrastructure.
 - The expansion of equipment does not pose any problems of wastewater, water quality, gas, soot and dust, heat radiation, or waste.
 - The transformer noise does not pose any real problems since there are no residential houses in the neighborhood.
 - The existing substation is surrounded by a wire mesh fence to protect the equipment and has guards posted on the premises.
 - In carrying out the project, it is necessary to pay attention to the following:
 - Since there is a village a little away from the project site, it is to be desired that the village people should be informed of the construction work.
 - Since the public road that leads to the accessway to the substation has a rough surface, due care must be exercised when transporting heavy objects and fragile things to the site.

B2: Expansion of Boma Mbuzi S/S equipment

- Project outline: Installation of main transformer protection (2 units), Rombo transmission line protection (1 unit), and Kiyungi transmission line protection (1 unit).
- EIA results:
 - Since this project involves expansion of equipment on the grounds of an existing substation, there is no need to acquire an extra plot of land. The site has sufficient space for the project and has already been leveled. It poses no problems of landscape, land acquisition, or geologic/topographic stability.
 - The site is in a developed area, which contains neither a wildlife protection zone nor a cultural asset protection zone.
 - Since there are no residential houses/communities in the neighborhood of the existing substation, it is unlikely that the project will have adverse effects on the existing communities or infrastructure.
 - The expansion of equipment does not pose any problems of wastewater, water quality, gas, soot and dust, heat radiation, or waste.
 - The transformer noise does not pose any real problems since there are no residential houses in the neighborhood.
 - In carrying out the project, it is necessary to pay attention to the following:
 - Since the project site faces a comparatively busy public road, care should be exercised not to interfere with the road traffic.
 - Since the public road in front of the substation has a rough surface, due care should be exercised when transporting heavy objects and fragile things to the site.
 - The existing equipment protection is insufficient. After the operation is started, it is necessary to provide the equipment with additional protection (e.g., erecting a wall, stretching barbed wire, and posting guards).

B3: Expansion of Trade School S/S

- Project outline: Expansion of main transformer 33/11 kV, 10 MVA (1 unit), installation of 33 kV circuit breaker for main transformer protection (1 unit), installation of 33 kV circuit breaker for Machame transmission line protection (1 unit) and replacement of 11 kV feeder outgoing cable.
- EIA results:
 - This project involves installation of additional equipment on the grounds of an existing substation. It is necessary to acquire an some neighborhood plot of land, however the project does not pose any problems of landscape or land acquisition.
 - The site has already been leveled and is stable geologically and topographically. However, since it has an inclined surface, care should be exercised during execution of the project.
 - The site is in a developed area, which contains neither a wildlife protection zone nor a cultural asset protection zone.
 - Since there are no residential houses/communities in the neighborhood of the existing substation, it is unlikely that the project will have adverse effects on the existing communities or infrastructure.
 - The expansion of equipment does not pose any problems of wastewater, water quality, gas, soot and dust, heat radiation, or waste.
 - The transformer noise does not pose any real problems since there are no

residential houses in the neighborhood.

- In carrying out the project, it is necessary to pay attention to the following:

Since the public roads around the project site are comparatively busy, care should be exercised not to interfere with the road traffic during execution of the project.

Since the road in front of the substation is rough and inclined, due care should be exercised when transporting heavy objects and fragile things to the site.

There is a village a little away from the project site. It is to be desired that the village people should be informed of the construction work.

The existing equipment protection is insufficient. After the operation is started, it is necessary to provide the equipment with additional protection (e.g., erecting a wall, stretching barbed wire, and posting guards).

B4: Renewal of Same S/S equipment

- Project outline: 33 kV circuit protection (1 unit).

- EIA results:

- Since this project only involves expansion of equipment on the grounds of an existing substation, there is no need to acquire an extra plot of land. The site that has already been leveled has sufficient space for the project. The project does not pose any problems of landscape or land acquisition.

- The site is situated in a developed area, which contains neither a wildlife protection zone nor a cultural asset protection zone.

- Since there are no residential houses/communities in the neighborhood of the existing substation, it is unlikely that the project will have adverse effects on the existing communities or infrastructure.

- The expansion of equipment does not pose any problems of wastewater, water quality, gas, soot and dust, heat radiation, or waste.

- The transformer noise does not pose any real problems since there are no residential houses in the neighborhood.

- In carrying out the project, it is necessary to pay attention to the following:

Since the public roads around the project site are comparatively busy, care should be exercised not to interfere with the road traffic during execution of the project.

The existing substation is surrounded by a wall to protect the equipment. In addition, guards are posted on the premises of the substation.

(C) Arusha

Expansion of Njiro S/S main transformer

- Project outline: Installation of 132/33 kV, 45 MVA transformer (1 unit).

- EIA results:

- Since this project only involves installation of an additional transformer on the grounds of an existing substation, there is no need to acquire an extra plot of land. The site that has already been leveled has sufficient space for the project. The project does not pose any problems of landscape or land acquisition.

- The site is situated in a developed area, which contains neither a wildlife protection zone nor a cultural asset protection zone.

- Since there are no residential houses/communities in the neighborhood of the existing substation, it is unlikely that the project will have adverse effects on the existing communities or infrastructure.
- The installation of an additional transformer does not pose any problems of wastewater, water quality, gas, soot and dust, heat radiation, or waste.
- The transformer noise does not pose any real problems since there are no residential houses in the neighborhood.
- The existing substation is surrounded by a wall and barbed wire to protect the equipment. In addition, guards are posted on the premises of the substation.

(b) Environmental considerations during project execution

In executing substation/transmission line construction work, consideration must be given to the following matters:

- Noise from construction machines
- Scattering of dust and dirt
- Vibration caused by construction materials and heavy machines during transportation
- Treatment of waste/wastewater and removal of surplus soil, etc. (e.g., treatment of turbid water produced during foundation work)
- Control of access to the construction site
- Stretching of overhead cable at suitable height to prevent traffic congestion

(c) Environmental considerations during project operation

(i) Periodical inspection

- In order to prevent destruction of the electrical equipment, it is important to patrol the site periodically, erect a wall for equipment protection, post guards, and so on.
- Crop cultivation and bonfires under a transmission line must be prohibited. The crop can cause a power stoppage by making contact with the transmission line, and a bonfire can spread to destroy wooden poles which support the transmission line.

(ii) Oil leak from transformer

- If the transformer insulating oil leaks, it can contaminate the soil within and outside the premises of the substation. In order to prevent this, it is necessary to provide each transformer with an oil pan and check the transformer for oil leak periodically.

(iii) Other considerations

- It is extremely important to teach in school that “intentionally destroying public facilities, including electric power facilities, is a totally mean act which causes a power stoppage and impedes economic growth and prosperity.”

(d) Land acquisition and compensation

- In order for TANESCO to carry out the projects successfully, it is an essential prerequisite to acquire the project sites smoothly and make proper compensation for the loss of private properties (houses, etc.) caused by the evacuation.
- It is also necessary that the land leased for temporary work, etc. should be restored and returned to the land owner(s) after completion of the project.

(2) Follow-up

During execution of each of the projects, the contractor shall execute a suitable monitoring program which includes the following. This item corresponds to the monitoring stated in the Draft EIA Procedure.

- Monitoring of environmental disruption
- Evaluation of measures to reduce environmental impact
- Validity of approved environmental management plan
- Observance of environmental management and assessment

(A1) Dar es Salaam – Installation of New Oysterbay S/S (1)

Environmental characteristic affected	Potential environmental impact	Environmental restoration	EIA technique used	Plan, policy, and procedure	Public interest	Other relevant factor	Remarks
(1) Geological features	Subsoil is not poor. Ground has been leveled.	_____	_____	_____	_____	_____	Installation of new substation on leveled ground. No need for acquisition of extra land.
Topographic stability	Ground is level. No problems.	_____	_____	_____	_____	_____	No steep slopes.
Landscape	Land has been acquired. There are no residential houses nearby. No problems.	_____	Visual confirmation	_____	Landscape of S/S viewed from outside will change.	_____	No change in landscape outside S/S.
(2) Wastewater	No problem.	_____	_____	_____	_____	_____	Wastewater not produced.
Water quality	No problem.	_____	_____	_____	Oil leak might adversely affect ground water.	Periodical inspection is important to prevent oil leak.	_____
(3) Biota	No problem because new S/S is to be installed on developed land.	_____	_____	_____	_____	_____	Site is not situated in national park, nature protection zone, etc.
(4) Access to site	There is accessway from public road to site.	_____	_____	_____	_____	_____	Care must be exercised to prevent traffic accidents at point of access from public road.
Transportation system	Above existing accessway is used to transport construction materials and machines.	_____	_____	_____	_____	_____	Public road has much traffic.
(5) Existing infrastructure	No impact on existing electric power, water, and telephone facilities.	_____	_____	_____	_____	_____	_____
(6) Existing community facilities	There are no residential houses/community facilities nearby.	_____	Visual confirmation.	_____	_____	_____	No residential houses/community facilities nearby.
(7) Existing security/emergency plans	No problems.	_____	_____	_____	_____	_____	No existing plans.
(8) Gas	No problems.	_____	_____	_____	_____	_____	_____
Soot and dust	No problems.	_____	_____	_____	_____	_____	_____
Noise	Transformer operating sound/corona sound.	_____	_____	No real problems because no houses nearby.	_____	_____	_____
Heat	No problems.	_____	_____	_____	_____	_____	_____
(9) Waste	No problems.	_____	_____	_____	_____	_____	_____
Flood	No problem.	_____	_____	_____	_____	_____	_____
(10) Use of nearby land	No special problems.	_____	_____	_____	_____	_____	There are no nature protection zones/health resorts nearby.
(11) Visual	No problem.	_____	_____	_____	_____	_____	_____
(12) Social	New S/S is to be installed on leveled ground. Site is not situated in buried cultural asset protection area.	_____	_____	_____	_____	_____	_____
(13) Other	Site adjoins TANESCO's Kinondoni North Office.	_____	_____	_____	_____	_____	_____

(A2) Dar es Salaam – Modification of Ubungo S/S (2)

Environmental characteristic affected	Potential environmental impact	Environmental restoration	EIA technique used	Plan, policy, and procedure	Public interest	Other relevant factor	Remarks
(1) Geological features	Subsoil is not poor. Ground has been leveled within existing substation..	_____	_____	_____	_____	_____	Modification of new substation on leveled ground. No need for acquisition of extra land.
Topographic stability	Ground is level. No problems.	_____	_____	_____	_____	_____	No steep slopes.
Landscape	Land has been acquired. There are no residential houses nearby. No problems.	_____	Visual confirmation	_____	Landscape of S/S viewed from outside will change.	_____	No change in landscape outside S/S.
(2) Wastewater	No problem.	_____	_____	_____	_____	_____	Wastewater not produced.
Water quality	No problem.	_____	_____	_____	_____	_____	_____
(3) Biota	No problem because equipment is to be installed on developed land.	_____	_____	_____	_____	_____	Site is not situated in national park, nature protection zone, etc.
(4) Access to site	There is accessway from public road to site.	_____	_____	_____	_____	_____	Care must be exercised to prevent traffic accidents at point of access from public road.
Transportation system	Above existing accessway is used to transport construction materials and machines.	_____	_____	_____	_____	_____	Public road has much traffic.
(5) Existing infrastructure	No impact on existing electric power, water, and telephone facilities.	_____	_____	_____	_____	_____	_____
(6) Existing community facilities	There are roads and factories nearby, but not residential houses/community facilities.	_____	Visual confirmation.	_____	_____	_____	No residential houses/community facilities nearby.
(7) Existing security/emergency plans	No problems.	_____	_____	_____	_____	_____	No existing plans.
(8) Gas	No problems.	_____	_____	_____	_____	_____	_____
Soot and dust	No problems.	_____	_____	_____	_____	_____	_____
Noise	Transformer operating sound/corona sound.	_____	_____	No real problems because no houses nearby.	_____	_____	_____
Heat	No problems.	_____	_____	_____	_____	_____	_____
(9) Waste	No problems.	_____	_____	_____	_____	_____	_____
Flood	No problem.	_____	_____	_____	_____	_____	_____
(10) Use of nearby land	No special problems.	_____	_____	_____	_____	_____	There are no nature protection zones/health resorts nearby.
(11) Visual	No problem..	_____	_____	_____	_____	_____	_____
(12) Social	Modification of S/S on existing ground which is not included in buried cultural asset protection zone..	_____	_____	_____	_____	_____	_____
(13) Other	_____	_____	_____	_____	_____	_____	Measures to protect equipment have been taken (wall, barbed wire, guards).

(A3) Dar es Salaam – Construction of 132 kV transmission line between Ubungo S/S and New Oysterbay S/S (evaluation of sites of steel towers for transmission line and ground route under transmission line) (3)

Environmental characteristic affected	Potential environmental impact	Environmental restoration	ELA technique used	Plan, policy, and procedure	Public interest	Other relevant factor	Remarks
(1) Geological features	Poor subsoil shall be avoided for construction of steel towers.	_____	_____	_____	_____	_____	Poor subsoil must be consolidated.
Topographic stability	Level ground shall be selected.	_____	_____	_____	_____	_____	Ground having steep slope must be leveled.
Landscape	Steel towers affect landscape.	_____	Visual confirmation	_____	Landscape will change.	_____	Residential areas must be bypassed as far as possible.
(2) Wastewater	No problem.	_____	_____	_____	_____	_____	Wastewater not produced.
Water quality	No problem.	_____	_____	_____	_____	_____	_____
(3) Biota	Transmission line passes over suburb of Dar es Salaam.	_____	_____	_____	_____	_____	Site is not situated in national park, nature protection zone, etc.
(4) Access to site	Accessway shall be constructed as required.	_____	_____	_____	_____	_____	_____
Transportation system	If transmission line crosses over existing road, it must not interfere with road traffic.	_____	Transmission line shall be stretched high above ground, etc.	_____	There is possibility of electrostatic induction.	_____	Same applies to transmission line which crosses over river.
(5) Existing infrastructure	No adverse effects on electric power/water supply. Radio and TV reception might be affected.	_____	_____	_____	TV reception and radio communications might be affected.	_____	_____
(6) Existing community facilities	Transmission route should bypass residential area as far as possible.	_____	_____	_____	_____	_____	_____
(7) Existing security/emergency plans	(There are no existing plans.)	_____	_____	_____	_____	_____	_____
(8) Gas	Not produced.	_____	_____	_____	_____	_____	_____
Soot and dust	Not produced.	_____	_____	_____	_____	_____	_____
Noise	Might be produced.	_____	_____	_____	Noise might be produced when wind is strong.	_____	Hissing sound.
Heat	Not produced.	_____	_____	_____	_____	_____	_____
(9) Waste	Not produced.	_____	_____	_____	_____	_____	_____
Flood	No fear of floods.	_____	_____	_____	_____	_____	_____
(10) Use of nearby land	Health resorts should be bypassed as far as possible.	_____	_____	_____	_____	_____	_____
(11) Visual	Flights might be adversely affected.	_____	Installation of airplane warning lights, etc.	_____	Flights might be adversely affected.	_____	Attention should be paid to Aviation Act, etc.
(12) Social	Site is not included in buried cultural asset protection zone.	_____	_____	_____	_____	_____	_____
(13) Other	Proper compensation should be made for land acquired for construction of steel towers and transmission line. Attention should be paid to military installations.	_____	_____	_____	_____	_____	_____

(B1) Moshi – Renewal of Kiyungi S/S equipment (4)

Environmental characteristic affected	Potential environmental impact	Environmental restoration	EIA technique used	Plan, policy, and procedure	Public interest	Other relevant factor	Remarks
(1) Geological features	Subsoil is not poor. Ground has been leveled within existing substation..	_____	_____	_____	_____	_____	No need for acquisition of extra land.
Topographic stability	Ground is level. No problems.	_____	_____	_____	_____	_____	No steep slopes.
Landscape	Renewal of equipment on existing ground poses no problems.	_____	Visual confirmation	_____	Landscape of S/S viewed from outside will change.	_____	No change in landscape outside S/S.
(2) Wastewater	No problem.	_____	_____	_____	_____	_____	Wastewater not produced.
Water quality	No problem.	_____	_____	_____	Oil leak might adversely affect ground water.	Periodical inspection is important to prevent oil leak.	_____
(3) Biota	Renewal of equipment on existing developed ground poses no problems.	_____	_____	_____	_____	_____	Site is not situated in national park, nature protection zone, etc.
(4) Access to site	There is accessway from public road to site.	_____	_____	_____	_____	_____	Care must be exercised to prevent traffic accidents at point of access from public road.
Transportation system	Above existing accessway is used to transport construction materials and machines.	_____	_____	_____	_____	_____	Public road has not much traffic.
(5) Existing infrastructure	No impact on existing electric power, water, and telephone facilities.	_____	_____	_____	_____	_____	_____
(6) Existing community facilities	There are no residential houses/community facilities nearby.	_____	Visual confirmation.	_____	_____	_____	Local communities shall be informed of construction plan as required.
(7) Existing security/emergency plans	No problems.	_____	_____	_____	_____	_____	No existing plans.
(8) Gas	No problems.	_____	_____	_____	_____	_____	_____
Soot and dust	No problems.	_____	_____	_____	_____	_____	_____
Noise	Transformer operating sound/corona sound.	_____	_____	No real problems because no houses nearby.	_____	_____	_____
Heat	No problems.	_____	_____	_____	_____	_____	_____
(9) Waste	No problems.	_____	_____	_____	_____	_____	_____
Flood	No problem.	_____	_____	_____	_____	_____	_____
(10) Use of nearby land	There are no nature protection zones/health resorts nearby.	_____	_____	_____	_____	_____	_____
(11) Visual	No problem..	_____	_____	_____	_____	_____	Site not subject to Aviation Act.
(12) Social	Site is not situated in buried cultural asset protection area.	_____	_____	_____	_____	_____	_____
(13) Other	_____	_____	_____	_____	_____	_____	Measures to protect equipment have been taken (wall, barbed wire, guards).

(B2) Moshi – Replacement of Boma Mbuzi S/S equipment (5)

Environmental characteristic affected	Potential environmental impact	Environmental restoration	EIA technique used	Plan, policy, and procedure	Public interest	Other relevant factor	Remarks
(1) Geological features	Subsoil is not poor. Ground has been leveled within existing substation..	_____	_____	_____	_____	_____	No need for acquisition of extra land.
Topographic stability	Ground is level. No problems.	_____	_____	_____	_____	_____	No steep slopes.
Landscape	Renewal of equipment on existing ground poses no problems.	_____	Visual confirmation	_____	Landscape of S/S viewed from outside will change.	_____	No change in landscape outside S/S.
(2) Wastewater	No problem.	_____	_____	_____	_____	_____	Wastewater not produced.
Water quality	No problem.	_____	_____	_____	Oil leak might adversely affect ground water.	Periodical inspection is important to prevent oil leak.	_____
(3) Biota	Renewal of equipment on existing developed ground poses no problems.	_____	_____	_____	_____	_____	Site is not situated in national park, nature protection zone, etc.
(4) Access to site	Site faces public road. No need for construction of new road for project.	_____	_____	_____	_____	_____	No need to build new access road for construction.
Transportation system	Traffic congestion of public road during vehicle access to/from site.	_____	Traffic control.	Traffic control.	Traffic congestion caused by construction vehicles.	Road in front of site has comparatively busy traffic.	_____
(5) Existing infrastructure	No impact on existing electric power, water, and telephone facilities.	_____	_____	_____	_____	_____	_____
(6) Existing community facilities	There are no residential houses/community facilities nearby.	_____	Visual confirmation.	_____	_____	_____	_____
(7) Existing security/emergency plans	No problems.	_____	_____	_____	_____	_____	No existing plans.
(8) Gas	No problems.	_____	_____	_____	_____	_____	_____
Soot and dust	No problems.	_____	_____	_____	_____	_____	_____
Noise	Transformer operating sound/corona sound.	_____	_____	No real problems because no houses nearby.	_____	_____	_____
Heat	No problems.	_____	_____	_____	_____	_____	_____
(9) Waste	No problems.	_____	_____	_____	_____	_____	_____
Flood	No problem.	_____	_____	_____	_____	_____	_____
(10) Use of nearby land	No special problems.	_____	_____	_____	_____	_____	_____
(11) Visual	No problem..	_____	_____	_____	_____	_____	_____
(12) Social	Site is not situated in buried cultural asset protection area.	_____	_____	_____	_____	_____	_____
(13) Other	Destruction of public facilities.	_____	_____	_____	Destruction of public facilities can cause power stoppage.	_____	Measures to protect equipment need to be taken (wall, barbed wire, guards).

(B3) Moshi – Expansion of Trade School S/S (6)

Environmental characteristic affected	Potential environmental impact	Environmental restoration	EIA technique used	Plan, policy, and procedure	Public interest	Other relevant factor	Remarks
(1) Geological features	Subsoil is not poor. Ground has been leveled within existing substation.	_____	_____	_____	_____	_____	No need for acquisition of extra land.
Topographic stability	Site is topographically stable but has slope.	_____	_____	_____	_____	_____	Due care must be exercised during construction work.
Landscape	Renewal of equipment on existing ground poses no problems.	_____	Visual confirmation	_____	_____	_____	No change in landscape outside S/S.
(2) Wastewater	No problem.	_____	_____	_____	_____	_____	Wastewater not produced.
Water quality	No problem.	_____	_____	_____	Oil leak might adversely affect ground water.	Periodical inspection is important to prevent oil leak.	_____
(3) Biota	Renewal of equipment on existing developed ground poses no problems.	_____	_____	_____	_____	_____	Site is not situated in national park, nature protection zone, etc.
(4) Access to site	Existing accessway from public road to site has rough surface.	_____	_____	_____	_____	_____	Care must be exercised to prevent traffic accidents at point of access to/from public road.
Transportation system	Above existing accessway is used to transport construction materials and machines.	_____	_____	_____	_____	_____	Care must be exercised during transportation of heavy objects/fragile materials.
(5) Existing infrastructure	No impact on existing electric power, water, and telephone facilities.	_____	_____	_____	_____	_____	_____
(6) Existing community facilities	There are no residential houses/community facilities nearby.	_____	Visual confirmation.	_____	_____	_____	Communities should be informed of construction work as required.
(7) Existing security/emergency plans	No problems.	_____	_____	_____	_____	_____	No existing plans.
(8) Gas	No problems.	_____	_____	_____	_____	_____	_____
Soot and dust	No problems.	_____	_____	_____	_____	_____	_____
Noise	Transformer operating sound/corona sound.	_____	_____	No real problems because no houses nearby.	_____	_____	_____
Heat	No problems.	_____	_____	_____	_____	_____	_____
(9) Waste	No problems.	_____	_____	_____	_____	_____	_____
Flood	No problem.	_____	_____	_____	_____	_____	_____
(10) Use of nearby land	No special problems.	_____	_____	_____	_____	_____	There are no nature protection zones/health resorts nearby.
(11) Visual	No problem.	_____	_____	_____	_____	_____	_____
(12) Social	Site is not situated in buried cultural asset protection area.	_____	_____	_____	_____	_____	_____
(13) Other	Destruction of public facilities.	_____	_____	_____	Destruction of public facilities can cause power stoppage.	_____	Measures to protect equipment need to be taken (wall, barbed wire, guards).

(B4) Moshi – Renewal of Same S/S equipment (7)

Environmental characteristic affected	Potential environmental impact	Environmental restoration	EIA technique used	Plan, policy, and procedure	Public interest	Other relevant factor	Remarks
(1) Geological features	Subsoil is not poor. Ground has been leveled within existing substation..	_____	_____	_____	_____	_____	No need for acquisition of extra land.
Topographic stability	Ground is level. No problems.	_____	_____	_____	_____	_____	No steep slopes.
Landscape	Renewal of equipment on existing ground poses no problems.	_____	Visual confirmation	_____	Landscape of S/S viewed from outside will change.	_____	No change in landscape outside S/S.
(2) Wastewater	No problem.	_____	_____	_____	_____	_____	Wastewater not produced.
Water quality	No problem.	_____	_____	_____	Oil leak might adversely affect ground water.	Periodical inspection is important to prevent oil leak.	_____
(3) Biota	Renewal of equipment on existing developed ground poses no problems.	_____	_____	_____	_____	_____	Site is not situated in national park, nature protection zone, etc.
(4) Access to site	There is accessway from public road to site.	_____	_____	_____	_____	_____	Care must be exercised to prevent traffic accidents at point of access from public road.
Transportation system	Above existing accessway is used to transport construction materials and machines.	_____	_____	_____	_____	_____	_____
(5) Existing infrastructure	No impact on existing electric power, water, and telephone facilities.	_____	_____	_____	_____	_____	_____
(6) Existing community facilities	There are no residential houses/community facilities nearby.	_____	Visual confirmation.	_____	_____	_____	No residential houses/community facilities nearby.
(7) Existing security/emergency plans	No problems.	_____	_____	_____	_____	_____	No existing plans.
(8) Gas	No problems.	_____	_____	_____	_____	_____	_____
Soot and dust	No problems.	_____	_____	_____	_____	_____	_____
Noise	Transformer operating sound/corona sound.	_____	_____	No real problems because no houses nearby.	_____	_____	_____
Heat	No problems.	_____	_____	_____	_____	_____	_____
(9) Waste	No problems.	_____	_____	_____	_____	_____	_____
Flood	No problem.	_____	_____	_____	_____	_____	_____
(10) Use of nearby land	No special problems.	_____	_____	_____	_____	_____	There are no nature protection zones/health resorts nearby.
(11) Visual	No problem..	_____	_____	_____	_____	_____	_____
(12) Social	Site is not situated in buried cultural asset protection area.	_____	_____	_____	_____	_____	_____
(13) Other	_____	_____	_____	_____	_____	_____	Measures to protect equipment have been taken (wall, barbed wire, guards).

(C) Arusha – Expansion of Njiro S/S transformer capacity (8)

Environmental characteristic affected	Potential environmental impact	Environmental restoration	EIA technique used	Plan, policy, and procedure	Public interest	Other relevant factor	Remarks
(1) Geological features	Subsoil is not poor. Ground has been leveled within existing substation.	_____	_____	_____	_____	_____	No need for acquisition of extra land.
Topographic stability	Ground is level. No problems.	_____	_____	_____	_____	_____	No steep slopes.
Landscape	Renewal of equipment on existing ground poses no problems.	_____	Visual confirmation	_____	Landscape of S/S viewed from outside will change.	_____	No change in landscape outside S/S.
(2) Wastewater	No problem.	_____	_____	_____	_____	_____	Wastewater not produced.
Water quality	No problem.	_____	_____	_____	Oil leak might adversely affect ground water.	Periodical inspection is important to prevent oil leak.	_____
(3) Biota	Expansion of equipment on existing developed ground poses no problems.	_____	_____	_____	_____	_____	Site is not situated in national park, nature protection zone, etc.
(4) Access to site	There is accessway from public road to site.	_____	_____	_____	_____	_____	Care must be exercised to prevent traffic accidents at point of access from public road.
Transportation system	Above existing accessway is used to transport construction materials and machines.	_____	_____	_____	_____	_____	Public road has not much traffic.
(5) Existing infrastructure	No impact on existing electric power, water, and telephone facilities.	_____	_____	_____	_____	_____	_____
(6) Existing community facilities	There are no residential houses/community facilities nearby.	_____	Visual confirmation.	_____	_____	_____	No residential houses/community facilities nearby.
(7) Existing security/emergency plans	No problems.	_____	_____	_____	_____	_____	No existing plans.
(8) Gas	No problems.	_____	_____	_____	_____	_____	_____
Soot and dust	No problems.	_____	_____	_____	_____	_____	_____
Noise	Transformer operating sound/corona sound.	_____	_____	No real problems because no houses nearby.	_____	_____	_____
Heat	No problems.	_____	_____	_____	_____	_____	_____
(9) Waste	No problems.	_____	_____	_____	_____	_____	_____
Flood	No problem.	_____	_____	_____	_____	_____	_____
(10) Use of nearby land	No special problems.	_____	_____	_____	_____	_____	There are no nature protection zones/health resorts nearby.
(11) Visual	No problem..	_____	_____	_____	_____	_____	Site not subject to Aviation Act.
(12) Social	Site is not situated in buried cultural asset protection area.	_____	_____	_____	_____	_____	_____
(13) Other	_____	_____	_____	_____	_____	_____	Measures to protect equipment have been taken (wall, barbed wire, guards).