

**REPUBLIC OF KENYA  
MINISTRY OF ENERGY (MOEn)  
KENYA POWER AND LIGHTING COMPANY (KPLC)**

**PREPARATORY SURVEY  
ON  
THE PROJECT  
FOR  
THE IMPROVEMENT OF POWER DISTRIBUTION SYSTEM  
IN AND AROUND NAKURU CITY  
AND  
AROUND MOMBASA CITY  
IN  
THE REPUBLIC OF KENYA**

**PREPARATORY SURVEY REPORT**

**March 2019**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**NIPPON KOEI CO., LTD.**

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## PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to Nippon Koei Co., Ltd.

The survey team held a series of discussions with the officials concerned of the Government of the Republic of Kenya, and conducted a field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Kenya for their close cooperation extended to the survey team.

March, 2019

Toshiyuki NAKAMURA  
Director General,  
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## ***Summary***



## Summary

### 1. Country Overview

The Republic of Kenya (hereinafter Kenya) is located directly under the equator of eastern Africa facing the Indian Ocean, bordering Ethiopia in the north, South Sudan in the northwest, Somalia in the east, Tanzania in the south and Uganda in the west. The land area is approximately 580,000 km<sup>2</sup>, and it is a varied terrain that varies from the Indian Ocean coast to the plains of 152 m above sea level and the highlands above 900 m above sea level. The climate of Kenya varies greatly in the central highlands and the Rift Valley, along the coast of the Indian Ocean, in the lakeshore of the western part and in the desert regions in the north, with greatly different temperatures and rainfall.

Kenya occupies a geographically important gateway as a shipping and air transportation gateway in the East Africa region with a population of about 49.69 million people in the countries, and the gross national income (GNI) per-capita is relatively high in the region at \$1,460 (2017), leading the regional economy. It is eager to promote the peace process in Sudan, the Great Lakes region etc., and is actively contributing to the peace and stability of the region. Such economic development of the country can be a growth model within East Africa region, and the aid to that country is greatly significant. In addition, the number of Japanese enterprises operating in Kenya is the second most in sub-Saharan Africa countries. While securing Kenya's economic and social stability, supporting its infrastructure development, human resource development, etc. are expected to lead to realization of private-led sustainable economic growth through promotion of private investments including those of Japanese enterprises.

Kenya has problems such as the increase of the poor by urbanization, the unemployment problem which becomes serious, especially among the young people, and the fact that 80 % of the land is dry and semi-arid lands and natural disasters occur frequently. It is significant from the perspective of "poverty reduction" and "sustainable growth", which are key issues of the ODA Charter, that Japan will support measures to address these problems. These kinds of assistance also contribute to the achievement of the commitment of Japan in TICAD.

In 2010 Kenya revised the Constitution through a national referendum and is working on improving administrative abilities such as limiting presidential powers, strengthening the independence of the judiciary, and decentralizing the state. It is of great significance to support it through aid to each field of the country to realize stable development in both political and economic aspects.

### 2. Background of Project

Kenya has launched "Vision 2030" as a medium to long-term development plan. Vision 2030 is a long-term development strategy of the Kenyan government that was established and completed in June

2008 following the vision strategy of emerging countries in Asia. It is aiming to become a middle-income country by 2030, setting a goal of "creating a prosperous country with a worldwide competitiveness and high quality of life by 2030". This vision comprehensively depicts Kenya's future image with three interdependent economies, society and politics, and sets the respective goals as follows.

- 1) Economy: Achieving 10% average annual economic growth rate and maintaining it until 2030
- 2) Society: Fair and impartial social development in a clean and safe environment
- 3) Politics: Achievement of task-fulfillment type, people-centered, result-oriented and accountable democratic system

Even after the inauguration of the new administration in April 2013, there has been no major change in the policy side. As a medium- to long-term development plan, the new administration follows the Vision 2030 as in the past. It positions the electric power sector as one of the economic foundations and tackles secure of necessary electricity, raise of the rural electrification rate, improvement of electricity service in urban areas etc. to maintain economic growth.

The Kenyan Government aims to prioritize improvement of rural electrification rate and improvement of electricity service in urban areas and to supply electricity to all the households by 2022. To this end, it has launched LMCP with support from each donor mainly African Development Bank (AfDB) and is working as a project towards top priority issues of the nation.

As of the end of December 2018 the electrification rate nationwide has reached 74.6 %, but to achieve the target of 2022 it is necessary to supply electricity to approximately 2.36 million households. In addition, transmission and distribution losses is currently around 19%, of which the distribution losses is about 15%, and reduction of power distribution losses is an urgent issue.

Under these circumstances, the Kenyan government requested Japan to implement "The Project for Improvement of Power Distribution System in and around Nakuru City and around Mombasa City". The executing agency, Kenya Power & Lighting Co. Ltd (KPLC), estimates that it will be possible to supply electricity to unelectrified around 14,671 households in urban areas and surrounding areas through the project. Moreover, the project is considered to contribute to the reduction of distribution losses by introducing low-loss type distribution transformers.

### **3. Outline of Study Result and Contents of the Project**

The periods of this survey are as follows:

- 1<sup>st</sup> Field Survey: April 9, 2018 ~ April 27, 2018
- 2<sup>nd</sup> Field Survey: June 24, 2018 ~ July 13, 2018
- 3<sup>rd</sup> Field Survey: December 2, 2018 ~ December 7, 2018

The targeted areas of the project are Nakuru County, Nyandarua County, Kilifi County, and Kwale

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County. The coverage of facilities and materials is as follows:

- 1) Procurement and construction of new distribution transformers and relative distribution line materials for extension and maximization
  - New low-loss type distribution transformers: 109 units  
(Capacity: ①50 kVA 33 kV/433V, ②50 kVA 11 kV/433 V, ③25 kVA 33 kV/240 V, ④25 kVA 11 kV/240 V)
  - AA HD bare conductor 1,200 km, ACSR 301 km
  - 11m concrete poles 114 pieces, 12m concrete pole 738 pieces, 10m wooden pole 10,627 pieces, 11m wooden pole 29 pieces
- 2) Procurement and construction of distribution line materials of existing distribution transformers for maximization
  - Estimated existing distribution transformers 294 units
  - AA HD bare conductor 1,211 km
  - 10m wooden poles 16,040 pieces

Procurement and installation of distribution equipment is to be executed in order to supply power to unelectrified houses within a radius of 600 m from the new transformer (109 units) and the existing transformers (294 units).

#### **4. Construction Time Schedules and Project Cost Estimation**

Works such as the contract of the Consultant, preparation of tender documents, tendering and the form of contract for the Contractor are mainly included in the detailed design stage of the project. The work period for the said stage is expected to be about six months after exchange of notes (E/N) is concluded between both countries. Meanwhile, the preparation of design drawings for approval, manufacturing, transportation, installation works, commissioning and taking-over are included in the procurement and construction stages. The corresponding work period for said stages will be taken about 20 months after the permission on the contract of the Contractor.

Expenses borne by the Kenyan side is estimated 223.65 million KES.

#### **5. Project Evaluation**

It is expected that the project will contribute to the increase of the present electrification rate through the reinforcement of the distribution networks in the four counties of Nakuru, Nyandarua, Kilifi, and Kwale. Moreover, the project is also expected to contribute to the reduction of distribution losses and greenhouse gases by utilizing the low-loss type distribution transformer.

Therefore, it is expected to contribute not only to the improvement of the living conditions of inhabitants in the target area of the project, but also to the mitigation of global warming. Considering this, it is judged that the relevance of the implementation of the project is very high.

## (1) Effectiveness

The quantifiable effects from the project are shown below.

Table 0-1 Quantifiable Effects by the Project

Evaluation	Final Target	Explanation
1) Increase of New Customers	14,671 households (73,355 persons)	The purpose of the project is electrification in areas without electric power, in accordance with LMCP.
2) Increase of Electricity Sales	6,462 [MWh/year]	It is expected to increase electricity sales energy through the newly electrified customers brought by the project.
3) Reduction of Distribution Losses	157.5 [MWh/year]	Reduction of distribution losses is expected through the introduction of the low-loss type distribution transformer for the project.
4) Reduction of CO <sub>2</sub> Emission	10.7 [ton-CO <sub>2</sub> /year]	Reduction of CO <sub>2</sub> emission is expected through reduction of distribution losses.

(Source: JICA Survey Team)

## (2) Qualitative Effects

The expected qualitative effects of the project are discussed below.

### 1) Beneficial effects to general customers

Judging from the current consumption of electric energy per household of around 100 W, it is estimated that the electricity demand of a new customer will be same and new customers will first utilize electrical light, replacing the kerosene lamps currently used. Owing to this, it is expected to have improvements in the living conditions and education level by enhancing the study environment of children.

In addition, it will be possible to use radios, televisions, and computers with high demand. The information available is excellent in quantity, quality, and simultaneity, and it is expected to directly benefit the improvement of the livelihood level of households.

### 2) Beneficial effects to public facilities and commercial facilities

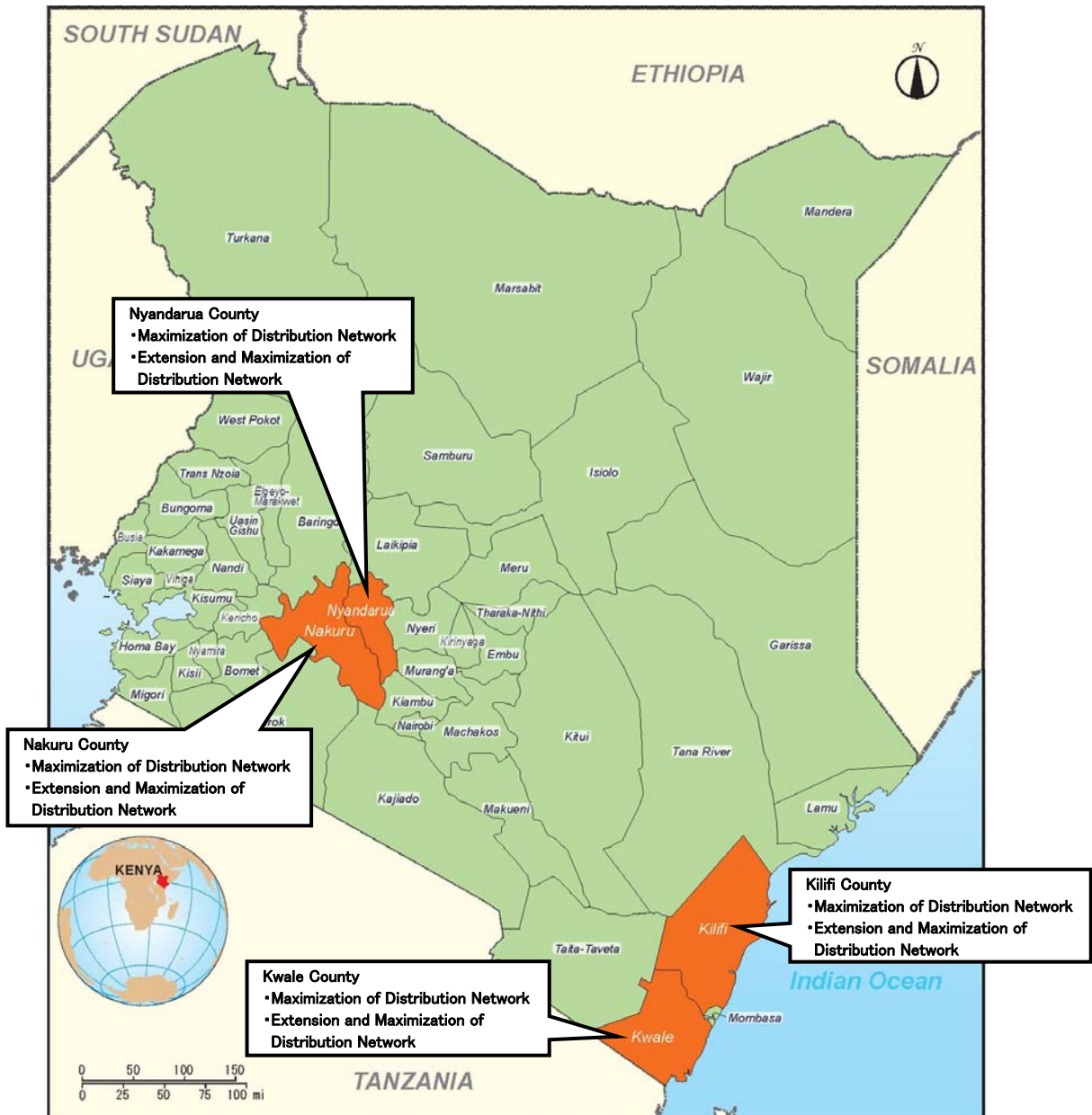
Although it seems difficult to specify clearly, it is expected that electricity would contribute to the enhancement of regional economy and accessibility to information, for example through the promotion of sales of fresh, chilled, high-value products, and digital learning using computers in schools.

In addition, electricity is expected to contribute to the decline in crime if lighting of public areas is completed. Thus, it is judged that the relevance of the project is very high.

# Location Map



The Republic of Kenya



(Source: JICA Survey Team)



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## Abbreviations

ACSR:	Aluminium Conductors Steel Reinforced
A/P:	Authorization to Pay
AFD	Agence Francaise de Developpment
AfDB:	African Development Bank
AIDS:	Acquired Immunodeficiency Syndrome
B/A:	Banking Arrangement
CO <sub>2</sub> :	Carbon Dioxide
DC:	Direct Current
D/L:	Distribution Line
EA:	Environmental Audit
E/N:	Exchange Notes
EIA:	Environmental Impact Assessment
EIB:	European Investment Bank
EMS	Energy Management System
EU:	European Union
F/S	Feasibility Study
IDA:	International Development Association
IDF:	Import Declaration Form
IEC:	International Electrotechnical Commission
IEE:	Initial Environmental Examination
IEEE:	The Institute of Electrical and Electronics Engineer
ISO:	International Organization for Standardization
G/A:	Grant Agreement
GDP:	Gross Domestic Product
GNI:	Gross National Income
GOK:	Government of Kenya
GWh:	Gigawatt hour= 10 <sup>9</sup> Wh
HIV:	Human Immunodeficiency Virus
JCS	Japanese Cable Makers' Association Standard
JEC:	Japan Electrotechnical Committee
JEM:	Japan Electric Machine Industry Association
JICA:	Japan International Cooperation Agency
JIS:	Japanese Industrial Standards
KenGen:	Kenya Electricity Generating Company
KES:	Kenyan Shilling
KETRACO:	Kenya Electricity Transmission Company
KPLC:	Kenya Power and Lighting Company
KS:	Kenya Standard
kV:	kilovolt = 10 <sup>3</sup> V
kW:	kilowatt = 10 <sup>3</sup> W
kWh:	kilowatt hour = 10 <sup>3</sup> Wh
LMCP:	Last Mile Connectivity Project
LV:	Low Voltage
MOEn:	Ministry of Energy
MV:	Medium Voltage
MW:	Megawatt = 10 <sup>6</sup> W
NEMA:	National Environment Management Authority
NOx:	Nitrogen Oxides
NT:	National Treasury
ODA:	Official Development Assistance
O&M:	Operation and Maintenance
PCB:	Poly Chlorinated Biphenyl
PF:	Power Factor
PM:	Particulate Matter
RDL:	Railway Development Levy
SCADA:	Supervisory Control And Data Acquisition

SLED:	Safety, Health and Environmental Department
S/S:	Substation
TICAD:	Tokyo International Conference on African Development
UNEP:	United Nations Environment Programme
US\$:	United State Dollar
VAT:	Value-Added Tax
WB:	The World Bank

**Chapter 1**  
***Background of the Project***



## Chapter 1 Background of the Project

### 1-1 Background of the Project

The Kenyan government is prioritizing the improvement of electrification rate in rural areas and electricity service in urban areas and is aiming to supply electricity to all households by the end of 2022. To achieve this, the Kenyan government has launched the Last Mile Connectivity Project (LMCP) as the nation's top priority project with support from several donors, mainly from the African Development Bank (AfDB) and the World Bank (WB).

Under these circumstances, the Kenyan government requested Japan to implement "The Project for Improvement of Power Distribution System in and around Nakuru City and around Mombasa City" (hereinafter referred to as "the project"). The executing agency, Kenya Power & Lighting Co. Ltd (KPLC), estimates that it will be possible to supply electricity to unelectrified around 14,671 households in urban areas and surrounding areas through the project. Moreover, the project is considered to contribute to the reduction of distribution losses by introducing low-loss type distribution transformers.

The target areas of the project include four counties, namely Nakuru, Nyandarua, Kilifi, and Kwale. Nakuru County and Nyandarua County are referred to as in and around Nakuru city, while Kilifi County and Kwale County are referred to as around Mombasa city in the project. The target equipment for procurement and installation are as follows:

- 1) New transformer and distribution equipment (Extension and Maximization)
- 2) Distribution equipment related to existing transformers (Maximization)

### 1-2 Environmental and Social Considerations

#### 1-2-1 Results of the Initial Environmental Examination (IEE)

Based on the IEE, all the anticipated major negative impacts are rated B, which means the anticipated impact is not very significant but some. They are described as follows:

##### (1) Planning Stage

###### 1) Social Environment

- Land acquisition and resettlement: Anticipated activities for the project include installation work of equipment for distribution lines, such as transformers and electric poles fittings/accessories, during construction and operation and maintenance stages of the equipment. Necessary space is mostly on-, above- and below the ground. In addition, there is a need to secure a very small space for erecting electric poles mostly within road reserves. Thus, anticipated involuntary resettlement is obtained through wayleaves acquisition only, which may

cause cutting and/or removal of structures, trees, crops, etc. Thus, neither land acquisition nor resettlement is expected to occur.

## (2) Construction Stage

### 1) Social Environment

- Water use: Water used for installation work may compete with community water supply.
- Existing social infrastructures and services: (i) Installation work may give rise to temporary traffic congestion and inconvenience for accessibility to social services in a small scale. (ii) Water use for installation work may compete with community water supply.
- Public health and sanitation: There is a possibility of deterioration of public health conditions due to the generation of air and water pollutants and solid waste, if proper pollution control management is not conducted in the construction work.
- Infectious diseases such as HIV/AIDS: In many developing countries, spreading of infectious diseases, such as HIV/AIDS, has often been reported due to contact of the locals people and the migrants workers employed at the construction site. Thus, outbreak of infectious diseases is expected a little during the construction stage, if proper measures such as exclusion of migrating workers and employing local people are not conducted.
- Working condition including occupational safety: Accidents due to falling and electric shock may occur at the construction sites.
- Hazard/risk (disaster and security): The uncontrolled behavior of workers such as during demonstrations may increase hazards to public security. In addition, deterioration of equipment is somewhat anticipated due to vandalism.
- Accidents: (i) Falling and electric shock accidents may occur at the construction site and in surrounding areas. (ii) Traffic accidents may occur at the construction site, which may be caused by vehicles used to ferry materials and construction machines during the construction stage.

### 2) Natural Environment

- Groundwater condition: Groundwater use for installation work may compete with community water supply.
- Flora, fauna, ecosystem, and biodiversity: (i) In Kenya, there are many endangered plant and animal species, as well as important areas of valuable ecosystems and biodiversity. However, the power distribution lines are not located within these areas. (ii) Cutting trees and damage to crops are anticipated if they are found close to the distribution equipment.

### 3) Environmental Pollution

- Air pollution: Exhaust emissions are likely to be generated by the vehicles used to ferry

materials and construction machines during the construction stage. In addition, generation of dust from construction work is also anticipated. These emissions may cause temporary negative impact on air quality.

- Water pollution: Small-scale excavating activities for construction work will be undertaken mostly in flat and small areas within 1-m diameter for erecting electric poles. In addition, soil will be used for backfill in the same area, if not wasted, or delivered to the storage sites of KPLC. Thus, soil runoff and subsequent water pollution is hardly anticipated. However, there is a possibility of surface water and groundwater contamination in case of accidental fuel/engine oil spill from construction vehicles and machines.

- Soil contamination: Leakage of insulating oil that comes from transformers as well as construction vehicles and machines is anticipated, which may arise from errors, poor handling, and vandalism. Potential contamination of soil may not only come from leaks, but also from unsafe disposal of creosote-treated distribution poles.

- Solid waste: Generation of general waste, such as garbage, and construction solid waste, such as gravel, stone, soil, and logged trees, is expected due to construction works.

- Noise and vibration: Generation of noise and vibration is expected during the operation of construction vehicles and machines.

- At the commissioning stage: Anticipated negative impacts are similar to those encountered in the construction stage.

### (3) Operation Stage

#### 1) Social Environment

- Public health and sanitation: There is a possibility of deterioration of public health conditions due to generation of air and water pollutants and solid waste if pollution control management in the operation and maintenance stage is not conducted appropriately.

- Working condition including occupational safety: Adverse impacts on working conditions, including occupational safety, are expected due to insufficient management for workers during the operation and maintenance of power distribution equipment.

- Hazard/risk (disaster and security): Uncontrolled behaviors of workers at the operation and maintenance stage may increase risk to public security. In addition, deterioration of the equipment is somewhat anticipated due to vandalism of workers and local people, if appropriate management of workers is not conducted.

- Accidents: (i) Falling and electric shock accidents may occur during the operation and maintenance stage. (ii) Leakage of fuel oil and insulator oil, which may include hazardous

materials, may occur by accident during installation and/or replacement works.

## 2) Environmental Pollution

- Water pollution: There is a possibility of accidental leakage of creosote oil and/or insulator oil, which may result to pollution of surface water and groundwater.
- Soil contamination: Soil contamination is expected due to leakage of transformer oil and creosote-treated distribution poles.
- Solid waste: Replacement of old transformers and wooden poles to new ones may generate hazardous solid waste if they contain creosote and other toxic materials.

The project was reclassified into Category B due to reasons discussed below.

### **1-2-2 Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP)**

In order to mitigate negative impacts, EMP as well as EMoP with JICA format were prepared and are shown in Appendix 5.

### **1-2-3 Involuntary Resettlement (Land Acquisition and Resettlement)**

Anticipated involuntary resettlement is done through wayleaves acquisition only, which may cause cutting and/or removal of structures, trees, crops, etc. Thus, neither land acquisition nor resettlement is expected to occur.

Therefore, a survey on affected assets and Project Affected Persons (PAPs) due to wayleaves acquisition was conducted.

### **1-2-4 Confirmation of Environmental and Social Consideration by the JICA Environmental Checklist**

Results are shown in Appendix 5.



***Chapter 2***  
***Contents of the Project***



## Chapter 2 Contents of the Project

### 2-1 Basic Concept of the Project

#### (1) Objective of the Project

The Kenyan government plans to supply power to all households by 2022. As of December 2018, about 6.9 million customers were connected to the grid, which raised the electrification rate to 74.6%<sup>1</sup>. However, to achieve universal access by the year 2022, it needs more rapid pace of the electrification.

The project contributes to the Kenyan government's plan that aims to increase the electrification rate in the country and to improve the economic infrastructure by supplying necessary equipment and constructing distribution lines to supply electricity to unelectrified households. And the project also aims to contribute to reduce distribution losses by introducing low-loss type distribution transformers.

#### (2) Summary of the Project

The targets of the project are four counties of Nakuru, Nyandarua, Kilifi, and Kwale.

Through the project, it is expected that an additional 14,671 households will be grid connected, and distribution losses will be reduced by 157.5 MWh. (For details, please refer to Chapter 3 Project Evaluation.)

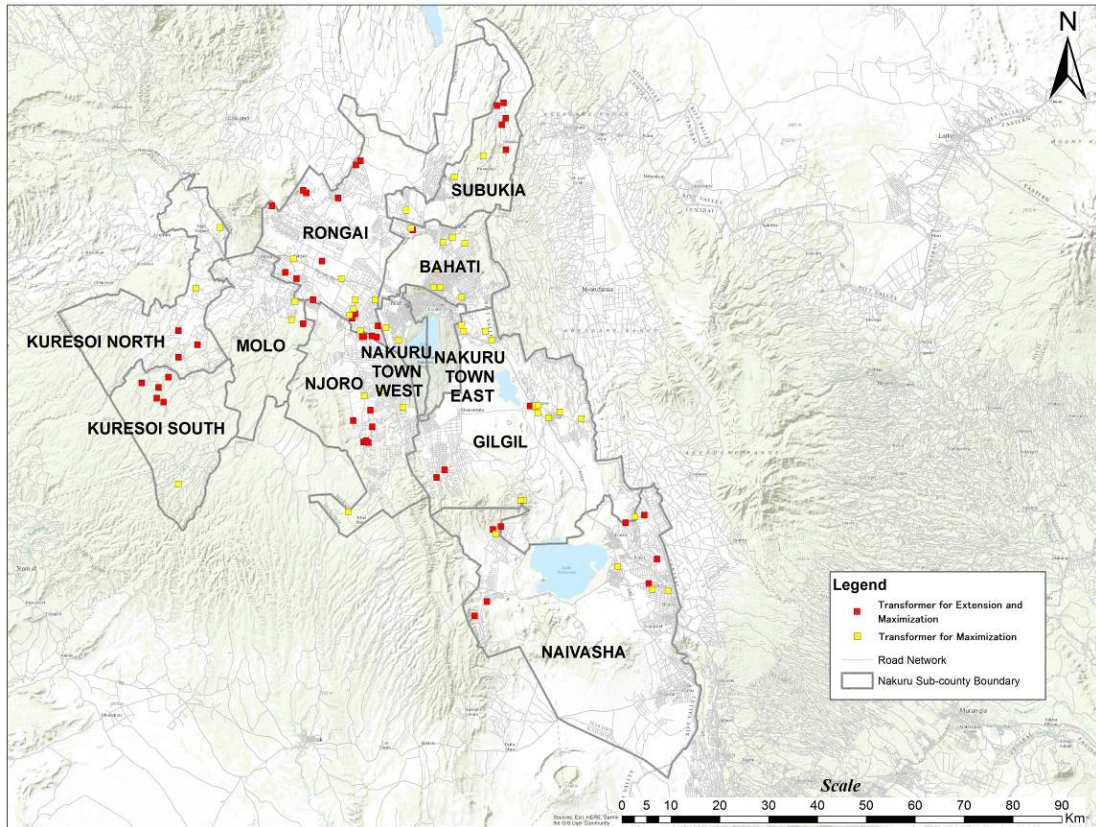
The number of related existing distribution transformers for maximization and new distribution transformers for extension and maximization are shown by county in Table 2-1-1.

Table 2.1-1 Number of Distribution Transformers

Target Area	Maximization	Extension and Maximization		Total
		50 kVA	25 kVA	
Nakuru County	47	17	32	96
Nyandarua County	50	17	18	85
Kilifi County	120	9	5	134
Kwale County	77	5	6	88
Total	294	48	61	403

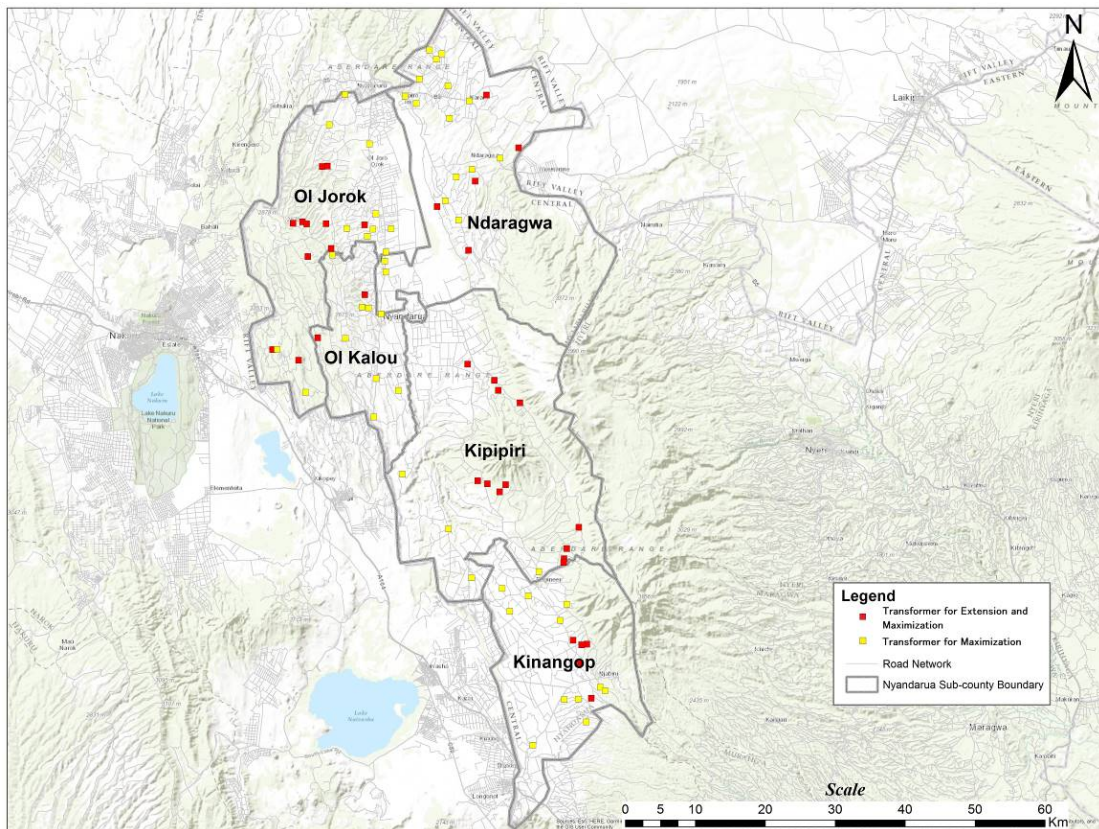
(Source: JICA Survey Team based on Request by the Kenyan side)

<sup>1</sup> KPLC, Annual Report and Financial Statements for the year ended 30 June 2018



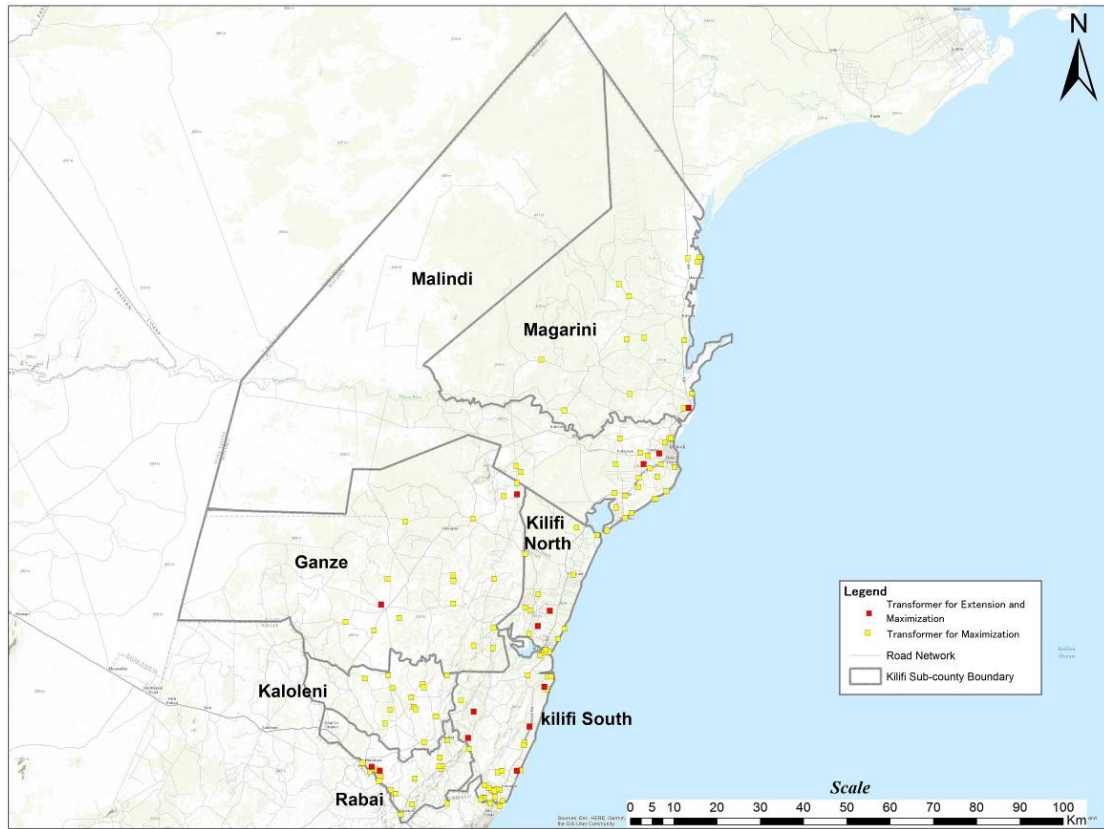
(Source: JICA Survey Team based on Request by the Kenyan side)

Fig. 2.1-1 Sites in Nakuru County



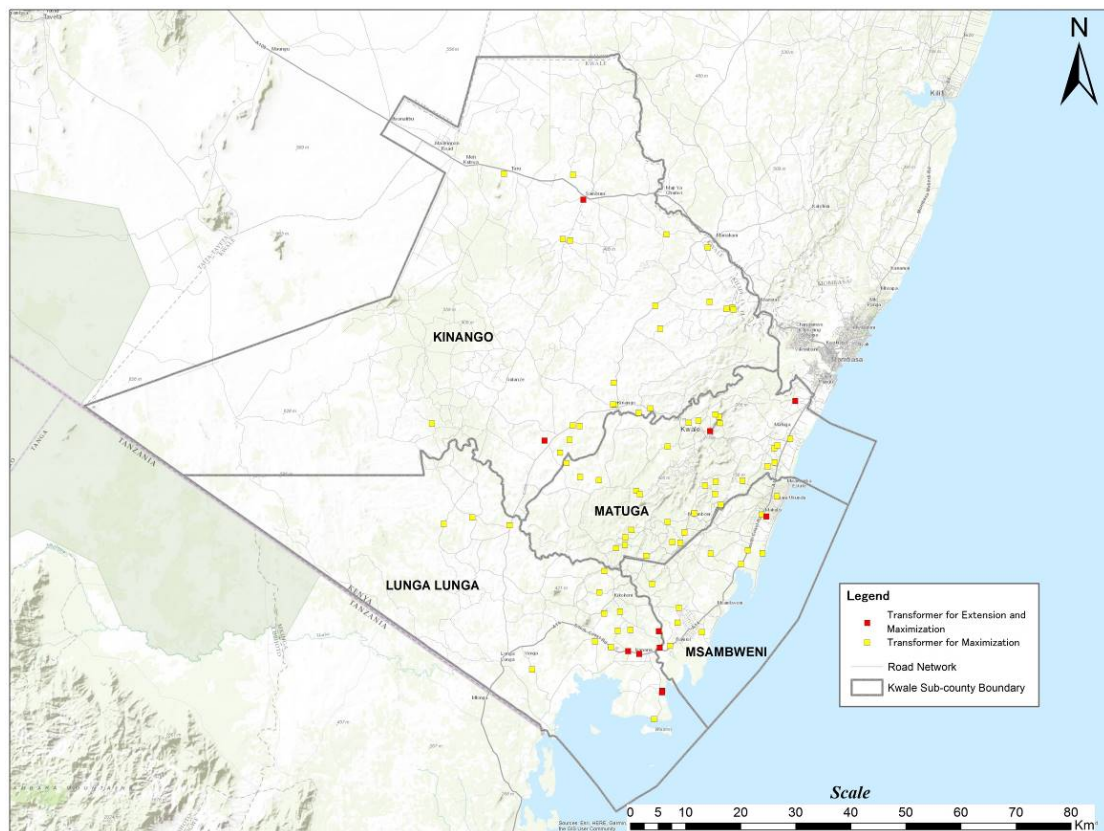
(Source: JICA Survey Team based on Request by the Kenyan side)

Fig. 2.1-2 Sites in Nyandarua County



(Source: JICA Survey Team based on Request by the Kenyan side)

Fig. 2.1-3 Sites in Kilifi County



(Source: JICA Survey Team based on Request by the Kenyan side)

Fig. 2.1-4 Sites in Kwale County

## 2-2 Outline Design of the Japanese Assistance

### 2-2-1 Design Policy

#### (1) Basic Policy

The basic policies of the project are as follows:

- 1) The application of low-loss type distribution transformers contributes to the reduction of distribution losses.
- 2) Specifications recommend that distribution transformers shall be in operation for altitudes higher than 2,200 m.
- 3) Low voltage (LV, 433 V and 240 V) circuit length shall be within 600 m from the relative distribution transformer, as stated in KPLC's design policy.
- 4) Concrete poles (11 m or 12 m high) shall be used for medium voltage (MV, 33 kV and 11 kV) lines, and wooden poles (10 m high) shall be used for LV lines.
- 5) The standard distance between MV poles and the distance between LV poles are 80 m and 50 m, respectively. The actual position of poles will be determined through a site survey during the construction period.
- 6) LV poles shall be installed at a minimum distance of 25 m from the targeted house to be electrified.
- 7) Protective Multiple Earthing (PME) shall be installed at 200-meter intervals, at every fourth LV pole or at the last LV pole of the LV circuit.
- 8) The grounding wire for LV shall be installed at the point of installation of the new distribution transformer. The grounding wire for MV shall be installed at the support structure of the new distribution transformer.
- 9) In accordance with KPLC's specification for the selection of a transformer capacity, a 50 kVA distribution transformer is installed in an area with more than 50 households. A 25 kVA distribution transformer is installed in an area with under 50 households.
- 10) Below is a summary of materials needed for the project:

#### Extension and Maximization

- Distribution transformers
- Support structures for distribution transformer
- Poles (concrete/wooden)
- Conductors (MV/LV)
- Expansion fuse
- Cutout fuse (to be used for the transformer)
- Insulators (MV/LV)

- Stay wire set
- Accessories for distribution line

#### Maximization

- Poles (wooden)
- Conductor (LV)
- Insulators (LV)
- Stay wire set
- Accessories for distribution line

## (2) Policy for Natural Condition

The targeted areas of the project are the Nakuru County and Nyandarua County around Nakuru city, and the Kilifi County and Kwale County around Mombasa city. The designated meteorological weather stations of the counties are as follows:

- Nakuru County: Nyahururu Agromet Station
- Nyandarua: County: Nakuru Meteorological Station
- Kilifi County: Mtwapa Agromet Station

However, there is no meteorological station in Kwale County. Because Kilifi County and Kwale County are both around Mombasa city, it is judged that there is not much difference in the geographical and meteorological conditions of both counties. Therefore, the observed data at the Mtwapa Agromet Station can apply to both counties.

Meteorological data (temperature, humidity, and precipitation) observed at the above stations are summarized below.

### 1) Temperature

Generally, Kenya has four climatic divisions (i.e., two rainy seasons and two dry seasons). Rainy seasons are from March to May and from November to December. Dry seasons are from June to October and from December to February.

Nakuru County and Nyandarua County has oceanic or maritime climate. There is cool and bearable weather during summer. Temperature drops near 0 °C at highland zones during winter.

Kilifi County and Kwale County has tropical dry or tropical savanna climate. The average temperature is more than 18 °C in winter and is approximately 30 °C in summer. It is hot and humid throughout the year.

Table 2.2-1 Average Monthly Temperature (Unit: °C)

		Jan.	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nyandarua	Max.	21.9	23.6	25.6	24.1	22.0	21.8	20.6	20.7	22.6	23.1	21.3	21.8
	Min.	10.2	7.8	8.9	10.2	9.3	7.1	8.7	7.3	6.0	7.3	9.0	8.4
Nakuru	Max.	26.5	28.7	30.2	27.0	25.2	25.2	24.4	24.5	26.7	26.9	25.1	26.7
	Min.	12.9	12.2	12.7	13.8	13.0	11.4	11.7	10.8	10.3	10.2	10.4	9.9
Kilifi	Max.	32.0	31.7	33.5	31.7	29.6	28.8	27.9	28.5	28.4	30.4	31.0	31.6
	Min.	24.6	23.7	25.4	25.3	23.9	23.4	21.9	22.2	21.9	23.0	24.0	23.9

(Source: Meteorological Department, Kenya, as of 2016)

## 2) Humidity

The average monthly humidity is shown in Table 2.2-2. However, there is missing data from the regional meteorological station. Humidity around Nakuru city drops to 20-60% in the afternoon. The average monthly humidity around Mombasa city is more than 70% throughout the year.

Table 2.2-2 Average Monthly Humidity (Unit: %)

		Jan.	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nyandarua (2013)	9 o'clock	70	63	71	85	85	86	85	86	77	69	80	80
	15 o'clock	45	34	42	64	58	59	60	69	57	54	66	58
Nakuru (2012)	9 o'clock	60	63	60	82	84	81	86	81	79	80	80	79
	15 o'clock	22	23	23	50	63	55	60	54	52	54	56	47
Kilifi (2015)	9 o'clock	76	76	79	81	87	83	86	84	-	76	83	79
	15 o'clock	69	68	69	72	76	71	76	76	-	71	77	73

(Source: Meteorological Department, Kenya)

## 3) Precipitation

The annual precipitation in Kenya is 700 to 1,200 mm (less than that of Tokyo which is at 1,400 mm). An average monthly precipitation of 120 mm shows that the rainy season occurs from March to April and from October to November.

Table 2.2-3 Average Monthly Precipitation (Unit: mm)

	Jan.	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nyandarua	13.8	11.7	9.4	35.3	80.8	32.3	150.5	136.8	151.3	87.3	79.8	4.4
Nakuru	3.8	14.8	4.2	35.3	92.1	36.7	148.5	90.7	150.9	130.5	44.8	5.1
Kilifi	0.0	11.7	90.3	171.5	591.5	53.9	14.0	64.8	133.1	93.7	194.1	81.9

(Source: Meteorological Department, Kenya, as of 2017)

## 4) Altitude

There is a big difference in the altitudes around Nakuru city and Mombasa city. The altitude around Mombasa city (without national reserves) is 0 to 200 m. On the other hand, the altitude around Nakuru city is 1,800 m in Nairobi and 2,200 m in Nakuru County and Nyandarua County.

## 5) KPLC's Design Criteria

KPLC's design criteria on climate are shown in Table 2.2-4.



Table 2.2-4 KPLC's Design Criteria

Item	Design Criteria	
Maximum temperature	°C	40
Minimum temperature	°C	1
Average humidity	°C	30
Average relative humidity	% rel.	95
Yearly thunderstorm (Isokeraunic level)	day	180
Altitude	m	2,200
Pollution level (in accordance with IEC 60815)	Heavy (around Nakuru city) Very heavy (around Mombasa city)	

(Source: Specification for Distribution Transformer, KPLC)

By comparing climate data and KPLC's design criteria, it is judged that KPLC's design criteria can be applied to the project.

### (3) Policy for Social Economical Condition

The gross domestic product (GDP) of Kenya in 2018 was USD 89.5 billion. The growth rate of the GDP in 2018 was 5.97%. The agriculture sector was 30% of the GDP and was 65% of the total exports of Kenya<sup>2</sup>. The agriculture sector also plays an important role in the employment of Kenyan economics. About 80% of the population have made their living from agriculture<sup>3</sup>.

Since independence in 1963 Kenya has maintained the capitalist regime and became the most economically developed country in East Africa. However, it has the problem of political unrest and political corruption / inefficiency, expansion of rich and poor gaps. The economic growth rate in 2007 was about 7%, in 2008 the growth rate was sluggish due to the domestic turmoil but in 2009-2010 it returned to 4-5% growth, in 2018 it was 5.97%.

In 2008, Kenya announced the long-term economic development strategy "Vision 2030" aiming to enter middle-income countries in 2030. Based on this strategy, it aims at (1) achievement of the average economic growth rate of over 10% every year by 2030, (2) fair social development, clean and safe environmental social improvement, and (3) sustainment of the democratic political system.

At the end of 2017, Kenya announced "BIG 4" consisting of four items: 1) manufacturing industry, 2) food and nutrition security, 3) universal health coverage, and 4) affordable housing supply as the key economic policy for the next five years.

### (4) Policy for Construction/Procurement Condition

The policies for construction/procurement conditions, including Kenyan laws and regulations, related to construction and procurement are shown below.

#### 1) Standards/Related Laws and Regulations

<sup>2</sup> International Monetary Fund, World Economic Outlook Database, October 2018

<sup>3</sup> FAOSTAT(Food and Agriculture Organization)

The Kenyan Industrial Standard, or the Kenya Standard (KS), is established and issued by the Kenya Bureau of Standards (KEBS) under the Ministry of Industry, Trade, and Cooperatives (MOITC).

KPLC has developed its own standards, Equipment and Facility Standards, compliant with KS and international standards, such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) standards. Therefore, it is possible to keep enough quality control by applying KPLC's Equipment and Facility Standards for equipment and facility design, method of construction works, and construction management. KS compliant materials, such as concrete poles and general distribution line materials, are available in the Kenyan local market.

## 2) Environmental Laws and Regulations

The Environmental Management and Co-ordination Act (EMCA) was enacted in 1999 and was enforced in 2000. The Act established, among others, the National Environment Council (NEC) as supervising agency, and the National Environment Management Authority (NEMA) as executive agency.

As in the executive detailed rules of EMCA, Environmental Impact Assessment (EIA), Environmental Audit (EA), and various regulations for prevention of pollution (e.g., aerial pollution, water pollution, waste materials, and noise) have been laid out and enforced. There are also various regulations for wildlife conservation, forestry management, water resources conservation, and worker's health management.

EIA, in accordance with EMCA, shall be attached to the application of permission for development project/natural resources utilization.

## 3) Land Decrees and Laws

By enforcing the National Land Policy in 2007, government land owned by ministries and related public corporations, trust land owned by local administrations, and private land have been realigned as public land, community land, and private land, respectively.

Other than land acquisition and resettlement issues, necessary procedures for acquiring wayleaves under transmission and distribution lines and entering to and usage of land for installation of public utilities such as sewer, pipelines, and cables are stipulated in the Wayleaves Act and the Energy Act. The project entails installation and operation of power distribution equipment such as transformers, electric poles and wires through, over or under the land. Therefore, the above Acts should be applied to the project.

## 4) Local Construction Companies

There are many local construction companies serving as prime contractor and subcontractor that have had experiences implementing KPLC's project. Through field investigation, it was

discovered that there is poor quality of finishing of works in some sites, such as disarrangement of insulators and inclined poles. This may be caused by inexperience or skill gaps in the contractor's capability. And there are some local construction companies with weak financial foundation who has made poor progress due to default on payment to the supplier of materials.

To avoid those trouble, experiences of similar work, technical and commercial capabilities shall be dully examined at the bid evaluation of selection of local contractors.

#### 5) Local Consultant

In Phase I and II of LMCP, KPLC already concluded projects with many local consultant firms. According to hearing of a KPLC engineer, local consultant engineers have adequate knowledge and experience on distribution line construction work and also have high capabilities for project supervision.

#### (5) Policy for Local Construction Company/Consultant

Since KPLC has much experience through contracts with local construction companies for distribution line construction projects of LMCP Phase I and Phase II in many areas of the country, many local construction companies are conversant with KPLC's logistics on the distribution line construction projects. The construction period of the project is rather short and the Government of Kenya aims to supply electric power to all households in the country by 2022. Therefore, it is recommended that the contractor of the project tap into experienced local sub-contractors who have involvement in KPLC's LMCP. Also, during the construction period, the contractor shall hire a well-experienced technical supervisor from Japan or the third countries for management and technical guidance for the project.

#### (6) Policy for Management, Operation, and Maintenance

As the implementation agency of the project, it is the responsibility of KPLC to manage, operate, and maintain the materials and equipment procured in the project. As of June 2018, 520 employees (including 230 engineers) are assigned to KPLC's 15 station offices which manage, operate, and maintain the distribution network in Kenya.

Because KPLC has enough experience on distribution network development projects under the finance of many donors, it seems that KPLC has well-trained staff for management, operation, and maintenance of the distribution network.

Table 2.2-5 Number of Distribution Transformers to be installed in the Project

Target Area	Existing Transformers (no.)	New Transformers (no.)	Growth Rate of New Transformers (%)
Nakuru County	3,832	49	1.3
Nyandarua County	1,985	35	1.8
Kilifi County	1,817	14	0.9
Kwale County	1,254	11	0.8

(Source: JICA Survey Team)

As per Table 2.2-5, growth rate of new transformers to be installed in each target area remain only 0.8 to 1.8% compared with the number of existing transformers, so it is considered that addition of personnel for the operation and maintenance is not necessary.

#### (7) Policy for Grade Selection of Materials and Equipment

Materials procured in the project shall satisfy KPLC's standards. Moreover, insulators used around Mombasa city shall be corrosion resistant (i.e., resistant to salt corrosion).

#### (8) Policy for Procurement and Construction Methods and Construction Schedule

Basically, a technically difficult construction method is not needed for distribution line work. However, due to the other ongoing phases of the LMCP under different financiers, the Japanese contractor will face the challenge of finding good local contractors with high technical and financial capabilities. For this purpose, it is recommended to request KPLC to disclose KPLC's evaluation result of good performance of contractors in the past projects.

### 2-2-2 Basic Plan (Construction Plan/Equipment Plan)

#### (1) Overall Plan

The targeted areas of the project are Nakuru County, Nyandarua County, Kilifi County, and Kwale County. The coverage of materials and equipment is as follows:

- 1) Procurement and construction of new distribution transformers and relative distribution line materials for extension and maximization
  - New low-loss type distribution transformers: 109 units  
(Capacity: ①50 kVA 33 kV/433 V, ②50 kVA 11 kV/433 V, ③25 kVA 33 kV/240 V, ④25 kVA 11 kV/240 V)
  - AA HD bare conductor 1,200 km, ACSR 301 km
  - 11m concrete poles 114 pieces, 12m concrete pole 738 pieces, 10m wooden pole 10,627 pieces, 11m wooden pole 29 pieces
- 2) Procurement and construction of distribution line materials of existing distribution transformers for maximization
  - Estimated existing distribution transformers 294 units
  - AA HD bare conductor 1,211 km
  - 10m wooden poles 16,040 pieces

Procurement and installation of distribution equipment is to be executed in order to supply power to unelectrified houses within a radius of 600 m from the new transformer (109 units) and the existing transformers (294 units).

#### (2) Material Procurement Plan

##### 1) Design Standard

The design standard for the project is shown in Chapter 2-2-1 Design Policy Clause (1).

## 2) Major Materials

Major materials (description, specifications, and quantity) needed for the project are shown in Table 2.2-5.

Table 2.2-6 List of Major Materials

No.	Description	Specification	Qty.	Remark
1.	PVC cable single-phase for service cable	PVC insulated single-phase concentric aluminum cable 10 mm <sup>2</sup>	275,540 m	Out of scope
2	Conductor 50 mm <sup>2</sup> AA HD bare	AAC hard drawn bare 50 mm <sup>2</sup>	2,411,414 m	
3-1	House service cut-out	1 phase 60/80A (double) + neutral	13,932 no.	Out of scope
3-2	Overhead service cut-out	1 phase 400A (for LV line)	327 no.	
4-1	11 kV expulsion fuse cut-out	Rated voltage 36 kV, drop-out type, altitude 2,200 m above, fuse 10A (for 11 kV line)	6 no.	To be included in 11 kV fittings
4-2	33 kV expulsion fuse cut-out	Rated voltage 36 kV, drop-out type, altitude above 2,200 m, fuse 15A (for 33 kV line)	28 no.	To be included in 33 kV fittings
5-1	Fittings for LV line (straight/terminal)	LV insulator, fixing hardware, etc.	19,082 sets	
5-2	Fittings for LV line (angle point)	LV insulator, fixing hardware, etc.	3,863 sets	
5-3	Fittings for LV line (branch point)	LV insulator, fixing hardware, etc.	3,683 sets	
6-1	Fittings for 11 kV line (straight)	11 kV pin insulator, fixing hardware, etc.	78 sets	
6-2	Fittings for 11 kV line (angle point)	11 kV pin insulator, fixing hardware, etc.	46 sets	
6-3	Fittings for 11 kV line (terminal)	11 kV pin insulator, fixing hardware, etc.	13 sets	
6-4	Fittings for 11 kV line (branch point)	11 kV tension insulator, fixing hardware, 11 kV protection cut-out, etc.	6 sets	
7-1	Fittings for 33 kV line (straight)	33 kV pin insulator, fixing hardware, etc.	1,097 sets	
7-2	Fittings for 33 kV line (angle point)	33 kV tension insulator, fixing hardware, etc.	173 sets	
7-3	Fittings for 33 kV line (terminal)	33 kV tension insulator, fixing hardware, etc.	119 sets	
7-4	Fittings for 33 kV line (branch point)	33 kV tension insulator, fixing hardware, 33 kV protection cut-out, etc.	57 sets	
8	Service cable fittings	Service cable insulator, fixing hardware	41,796 sets	Out of scope
9-1	Wooden pole 10 m (for LV)	For 433 V, upper outer diameter 160 mm, maximum loading 5.67 kN, creosote preservation, with upper color paint (green)	26,667 no.	
9-3	Wooden pole 11 m (for 11 kV)	For 11 kV, upper outer diameter 180 mm, maximum loading 7.13 kN, creosote preservation, with upper color paint (dark blue)	29 no.	
9-4	Concrete pole 11 m (for 11 kV)	For 11 kV, upper outer diameter 190 mm, maximum loading 8.3 kN, with upper color paint (dark blue)	114 no.	
9-6	Concrete pole 12 m (for 33 kV)	For 33 kV, upper outer diameter 190 mm, maximum loading 9.0 kN, with upper color paint (yellow)	738 no.	
10	Protective Multiple Earth	Bare aluminum wire 50 mm <sup>2</sup> , PVC cable, PVC	14,709 sets	

	(PME)	protection pipe, grounding rod		
11-1	Low-loss type distribution transformer 50 kVA 33/0.433 kV	$\Delta$ -Y, oil natural air natural, altitude 2,200 m above, lightning arrester mount type, service life 25 years, full load loss 1210 W	40 no.	
11-2	Low-loss type distribution transformer 50 kVA 11/0.433 kV	$\Delta$ -Y, oil natural air natural, altitude 2,200 m above, lightning arrester mount type, service life 25 years, full load loss 840 W	8 no.	
11-3	Low-loss type distribution transformer 25 kVA 33/0.240 kV	Oil natural air natural, altitude 2,200 m above, lightning arrester mount type, service life 25 years, full load loss 436 W	52 no.	
11-4	Low-loss type distribution transformer 25 kVA 11/0.240 kV	Oil natural air natural, altitude 2,200 m above, lightning arrester mount type, service life 25 years, full load loss 436 W	9 no.	
12	75 mm <sup>2</sup> ACSR conductor for MV line	Aluminum conductors steel reinforced (ACSR) 75 mm <sup>2</sup>	301,407 m	
13-1	H-pole structure	Concrete pole 12 m, fitting hardware for transformer, protection cut-out	48 sets	
13-2	Single-pole structure	Concrete pole 12 m, fitting hardware for transformer, protection cut-out	61 sets	
14-1	LV normal stay	Stay wire, stay block, fixing hardware, etc.	13,394 sets	
15-1	MV normal stay (for 11 kV)	Stay wire, stay block, fixing hardware, etc.	43 sets	
16-1	MV normal stay (for 33 kV)	Stay wire, stay block, fixing hardware, etc.	254 sets	
16-2	MV normal stay (for 33 kV, flying)	Stay wire, stay block, fixing hardware, etc.	7 sets	
17-1	MV earthing	Bare aluminum wire for earthing 50 mm <sup>2</sup> , PVC cable protection pipe, earthing rod	107 sets	
17-2	LV earthing	Bare aluminum wire for earthing 50 mm <sup>2</sup> , PVC cable protection pipe, earthing rod	214 sets	
18-1	Substation leads for MV	Bare copper wire 50 mm <sup>2</sup>	2180 m	
18-2	Substation leads for LV	AAC soft drawn PVC covered 70 mm <sup>2</sup>	3,270 m	

(Source: JICA Survey Team)

### 3) Basic Design

#### i) Distribution Transformer

Outdoor-type distribution transformers integrated with lightning arresters are to be installed.

These shall conform to IEC 60076. Other requirements on individual transformers are as follows:

Table 2.2-7 Specifications for Distribution Transformer

Description	Specification	
Rated output (kVA)	50	25
Type	Outdoor, oil-immersed self-cooling type	
Primary/secondary voltage	11, 33 kV/0.433 kV	11, 33 kV/0.240 kV
Connection	$\Delta$ -Y, 3-phase 3-wire / 3-phase, 4-wire	$\Delta$ -V, single-phase

(Source: JICA Survey Team based on KPLC standard)

#### ii) Conductors

Aluminum Conductor Steel Reinforced (ACSR) for MV line (33 kV and 11 kV) and AA HD Bare (all aluminum hard drawn bare conductors) for LV line are applied accordingly.

Table 2.2-8 Specifications for MV Line

Description	Specification
Rated voltage (kV)	11, 33
Type	ACSR
Sectional area (mm <sup>2</sup> )	75

(Source: JICA Survey Team based on KPLC standard)

Table 2.2-9 Specifications for LV Line

Description	Specification
Rated voltage (kV)	0.6/1.0
Type	AA HD Bare
Sectional area (mm <sup>2</sup> )	50

(Source: JICA Survey Team based on KPLC standard)

iii) Insulators

Pin type, disc type, and shackle insulators are applied for supporting conductors.

iv) Fuse

Cartridge type fuse is applied for transformer protection.

v) Arresters

Stand-alone type arrester is not applicable because integrated arresters with the distribution transformer are applied.

vi) Overhead Grounding Wire

Overhead grounding wire is not applicable.

vii) Poles

Poles for the distribution line shall be reinforced concrete or chemically-treated wood. The height of MV line poles shall be 11 m or 12 m, while the height of LV line poles shall be 10 m.

Table 2.2-10 Specifications of Distribution Line Poles (a)

Description	Type of Material
33 kV lines	Steel reinforced concrete
11 kV lines	Steel reinforced concrete
LV lines	Wooden pole Note: In case the lines have three phases, the steel reinforced concrete pole is considered.

(Source: JICA Survey Team based on KPLC standard)

Table 2.2-11 Specifications of Distribution Line Poles (b)

	33 kV line	11 kV line	LV line
Span	80 m	80 m	50 m
Distance from lower cross arm to the top of pole	0 m	0 m	-
Maximum sag of conductor	1.0 m	1.2 m	1.4 m
Minimum height of conductor above ground	9 m	8 m	7 m
Clearance (phase to phase)	0.92 m	0.77 m	0.31 m
Depth of pole	2.0 m	1.8 m	1.6 m
Pole height	12 m	11 m	10 m

(Source: JICA Survey Team based on KPLC standard)

### 2-2-3 Outline Design Drawing

The outline design drawings of the project are listed below and are attached as Appendix 6.

Table 2.2-12 List of Outline Design Drawings

No.	Drawing No.	Title
1	DWG No. NKR-MA-1~61	Nakuru County Maximization
2	DWG No. NKR-EX-1~50	Nakuru County Extension and Maximization
3	DWG No. NYA-MA-1~58	Nyandarua County Maximization
4	DWG No. NYA-EX-1~35	Nyandarua County Extension and Maximization
5	DWG No. KLF-MA-6~139	Kilifi County Maximization
6	DWG No. KLF-EX-1~14	Kilifi County Extension and Maximization
7	DWG No. KWL-MA-1~87	Kwale County Maximization
8	DWG No. KWL-EX-1~11	Kwale County Extension and Maximization
9	DWG No. TD-01~10	Typical Drawing

(Source: JICA Survey Team)

## 2-2-4 Implementation Plan

### 2-2-4-1 Implementation Policy

The project is to be implemented using a framework of a grant aid program from the Government of Japan (GoJ). After project approval of the project by GoJ, an Exchange of Note (E/N) between the two governments will be signed. The Grant Agreement (G/A) will be signed between JICA and the Kenyan side, and the Bank Arrangement (B/A) and Authorization to Payment (A/P) will be issued subsequently. After that, the Kenyan side will conclude the Consultant Contract, and the preparation of tender documents will commence through the consultant. Procurement and installation of equipment will be carried out by the Japanese contractor which is decided based on the outcome of tender evaluation.

#### (1) Implementation Agency of the Kenyan Side

In the project, the responsible organization and the executing organization for the Kenyan side are as follows:

- Responsible organization: Ministry of Energy (MOEn)
- Implementing organization: Kenya Power and Lighting Company (KPLC)

#### (2) Consultant

Based on the results of the preparatory survey and discussions with the Kenyan side, the consultant shall complete the tender documents in conformance with the requirements of the grant aid rules of Japan. The process includes request for proposals, clarifications to tender queries, attendance to tender closing and opening, tender evaluation, assistance during tender negotiations, and conclusion of the implementation contracts.

This process involves meetings among concerned parties before commencing site works, approval process for design drawings, factory inspection before shipment, supervision of site erection works, preparation of progress report during site construction, issuance of interim certificates, and attendance to site tests before taking over. The consultant reports the progress of the project to GoJ accordingly during



implementation.

After completion of the project, the consultant will issue a completion certificate, handle processes for taking over, prepare a completion report, and initiate defects liability tests to be carried out one year after the taking over.

### (3) Contractor

A Japanese contractor, which is selected through the tendering process, shall carry out the procurement and installation work for the project in accordance with the grant aid rules of Japan.

In accordance with the specifications prepared by the consultant, the Japanese contractor will carry out manufacturing factory inspection, packing for export, transport to site, erection, site tests, and taking over of all equipment related to the project. The Japanese contractor will have the overall responsibility of executing all the works, which includes ensuring quality, guarantee of equipment, defects liability, schedule management, etc.

## 2-2-4-2 Implementation Conditions

### (1) Consideration during Construction

The target area of the project spread a wide range of around Nakuru city (Nakuru County, Nyandarua County) and Mombasa city (Kilifi County, Kwale County). The construction shall be carried out separately for the 1<sup>st</sup> phase (around Nakuru city) and the 2<sup>nd</sup> phase (around Mombasa city). And the construction of 2<sup>nd</sup> phase (around Mombasa city) will be executed after the completion of 1<sup>st</sup> phase (around Nakuru city). Due to the security situation around Mombasa city, it is recommended for Japanese engineers not to stay in the area for more than one week. Instead, locally hired engineers should be assigned to carry out works around Mombasa city. However, Japanese engineers will monitor the progress of the project remotely.

Where construction machinery cannot be used to deliver the materials and equipment (e.g., poles) due to poor conditions, such as hilly and rugged terrains which are common around Nakuru city, the transport and installation of poles will be executed manually. Also, since installation works will be negatively affected during the rainy season (March to May and November to December), a well-planned and realistic schedule management will be necessary.

It is necessary to properly select a storage yard to prevent loss of equipment. And it is important to give attention to the safety of local residents and traffic vehicles.

### (2) Consideration on Procurement

It is necessary to procure and dispatch equipment according to the construction schedule in order to execute the construction smoothly. The contractor in the project will be required to manage procurement to be carried out, which includes procurement, manufacturing, transportation, and timely unloading.

In the target areas, there are unpaved, very narrow, rough earth roads. This may cause damage to the distribution poles and other equipment while being transported. Therefore, it is necessary to conduct a site survey of the road in advance to check its width, its shoulder, and the rough segments prior to transportation of distribution poles and other equipment. Furthermore, it is necessary to pay attention to the road conditions along slopes after rains due to the dangers of slipping, burying, slope collapse, etc.

### 2-2-4-3 Scope of Works

#### (1) Demarcation of Construction Works

The demarcation of construction works of the project between the Japanese side and the Kenyan side is shown in Table 2.2-13.

Table 2.2-13 Demarcation of Construction Works

No.	Item to be Undertaken	Japanese Side	Kenyan Side
1	Installation of distribution pole (MV line and , LV line)	✓	
2	Installation of distribution line (MV line and , LV line)	✓	
3	Installation of new transformer	✓	
4	Installation and connection of the service cable from LV line to the households, including fuse cut-out and meter box		✓
5	Provision of temporary storage yard with gate and fence for all project sites		✓
6	Nomination and allocation of responsible person from KPLC for coordination of power shutdown works for the project		✓

(Source: JICA Survey Team)

#### (2) Demarcation of Procurement and Installation

The demarcation of procurement and installation works of the project between the Japanese side and Kenyan side is shown in Table 2.2-14.

Table 2.2-14 Demarcations of Procurement and Installation Works

No.	Item to be Undertaken	Japanese Side	Kenyan Side
1	Low loss type distribution transformer	✓	
2	Wooden pole/concrete pole	✓	
3	Conductor, fittings, insulator, etc.	✓	
4	Fuse cut-out and meter box		✓
5	Service cable		✓

(Source: JICA Survey Team)

### 2-2-4-4 Consultant Supervision

In executing the project supervision, the consultant will pay attention to the following:

- a) Background of the project implementation
- b) Contents of the preparatory survey
- c) Framework of the grant aid assistance from Japan

- d) Contents of the E/N agreed between the two governments
- e) Site working conditions
- f) Stakeholders concerns on the project including sustainability

For smooth execution of the project, the senior engineer to be nominated as the project manager is required to have ample experience in similar types of services and enough understanding on the contents of the project. Moreover, it is necessary to establish an efficient organization consisting of engineers for detailed design, tendering, review and approval of design, factory inspection, and site supervision.

The following engineers will be assigned in the project to ensure work progress:

- Project Manager: In-charge of coordination of the project and instruction to the contractor
- Electrical Engineer (for site supervision): In-charge of supervision of schedule, quality, and procurement
- Inspection Engineer: In-charge of testing of equipment

#### (1) Basic Policies of Construction Supervision

The consultant shall manage and supervise the whole phase of works of the contractor so that the project works will be surely and safely executed on schedule, while taking into account the following items:

##### 1) Schedule management

- a) The progress of works on the Kenyan side shall be confirmed before commencing works of the contractor.
- b) Construction works of the Japanese contractor and the Kenyan side shall be confirmed and coordinated.
- c) Schedule coordination meetings shall be held at appropriate times for overall schedule management and shall be adjusted if necessary.

##### 2) Safety management

- a) The details of the work and the safety measures shall be explained to the executing agency.
- b) A meeting regarding the safety measures shall be held daily before commencement of works, and a safety patrol shall be carried out periodically.
- c) In case many works are executed at the same place, necessary safety measures shall be taken to avoid accidents by confirming works and schedules of concerned parties.
- d) Working at high places and near high-voltage distribution lines/charging sections are permitted under the supervision of safety personnel.
- e) Appropriate countermeasures shall be taken for surrounding areas that have pits or charging sections (e.g., isolation of rope).

##### 3) Quality control

- a) The contractor shall submit drawings, specifications, and calculation data for approval of the consultant who will review the submitted documents to confirm conformity to standards and quality to contract specifications.
- b) The consultant attends factory inspections before the shipment of major equipment to

confirm whether equipment have been manufactured according to approved drawings and contract specifications.

- c) The completion of construction works shall be tested at the site before project takeover.

## (2) Procurement Management Plan

### 1) Transport supervision

In order to be carry out site works smoothly according to the coordinated schedule, it is important to transport equipment and material procured for the project to the site without delay. The contractor in the project shall pay attention to timely arrangement, procurement, and manufacturing of equipment and materials so as not to delay customs clearance procedures, etc., and not to affect the progress of the project. The consultant instructs and supervises the contractor to ensure that the tax exemption process is implemented sufficiently and smoothly.

### 2-2-4-5 Quality Control Plan

Quality management of equipment and materials to be supplied under the project will be carried out through the following steps:

#### 1) Review of design drawings and specifications

After conclusion of the contract, the consultant will review drawings, specifications, and calculations submitted for approval by the contractor to confirm conformity to applied standards, contract specifications, etc. Manufacturing will start after approval by the consultant. This review will be performed in Japan.

For the distribution route map, technical confirmation, such as separation from obstacles according to profile (longitudinal section) data and sagging, is necessary; therefore, review of the drawings will be carried out at the site.

#### 2) Factory inspection

After equipment is manufactured, factory inspection through visual inspection and function tests will be carried out by the consultant before delivery to the site to confirm that the equipment is produced in accordance with applied standards and contract specifications.

#### 3) Site supervision and commissioning test

The consultant will carry out construction supervision with cooperation of KPLC engineers so that site construction and installation works are performed in accordance with the contract specifications and approved drawings. Commissioning tests are to be performed before taking over to confirm whether or not the works are completed in accordance with the specifications.

## 2-2-4-6 Procurement Plan

### (1) Purchasing Sources

The eligible source countries for the procurement of equipment and materials in Japanese grand aid generally include Japan or a recipient county (Kenya). It was confirmed in this survey that low-loss transformers cannot be procured in Kenya. Therefore, low-loss type transformers will be procured from Japan. However, in recent years many Japanese manufacturers are producing the products abroad for price competition. Considering this situation, low-loss type transformers shall also be procured from third counties as the eligible source countries. In this case, the manufacturer of the third country shall be its head quarter or parent company to be located in Japan.

The eligible source countries of each equipment and material to be procured for the project are shown in Table 2.2-15. And other points to be noted are as follows.

- 1) The low-loss type transformer will be procured from Japan (including production from third country by Japanese companies).
- 2) Concrete poles will be procured from Kenya because it has been confirmed that they have sufficient quality.
- 3) Conductors, fittings, insulators, and fuses will be procured from Kenya because there are many companies that provide them to KPLC.
- 4) These equipment of this table were requested by the Kenyan side. As a result of discussion with the Kenyan side, installation and connection of the service cable will be undertaken by the Kenyan side.

Table 2.2-15 Eligible Source Countries of Equipment and Materials

No.	Item	Procured in Kenya	Eligible Source Countries		Remark
			Japan or Kenya	Third countries	
1	10 mm <sup>2</sup> PVC insulated single phase concentric aluminum cable	✓	✓	-	To be undertaken by Kenyan side
2	Conductor 50 mm <sup>2</sup> AA HD bare	✓	✓	-	
3	Cutout service 1P+N 60/80 A (double)	✓	✓	-	To be undertaken by Kenyan side
4	LV wooden pole fitting	✓	✓	-	
5	LV concrete pole fitting	✓	✓	-	
6	MV wooden pole fittings	✓	✓	-	
7	MV concrete pole fittings	✓	✓	-	
8	Service cable wooden fittings	✓	✓	-	To be undertaken by Kenya side
9	Service cable concrete fittings	✓	✓	-	To be undertaken by Kenya side
10	Pole wood treated 10.0 m	✓	✓	-	
11	Pole concrete 10.0 m	✓	✓	-	
12	Pole wood treated 11.0 m	✓	✓	-	
13	Pole concrete 11.0 m	✓	✓	-	
14	Pole wood treated 12.0 m	✓	✓	-	
15	Pole concrete 12.0 m	✓	✓	-	

16	Protective Multiple Earthing (PME)	✓	✓	-	
17	Transformer 50 kVA 33/0.433 kV (low-loss type)	-	✓	✓	Eligible source countries of third countries will be India and Myanmar
18	Transformer 50 kVA 11/0.433 kV (low-loss type)	-	✓	✓	Eligible source countries of third countries will be India and Myanmar
19	Transformer 25 kVA 33/0.240 kV (low-loss type)	-	✓	✓	Eligible source countries of third countries will be India and Myanmar
20	Transformer 25 kVA 11/0.240 kV (low-loss type)	-	✓	✓	Eligible source countries of third countries will be India and Myanmar
21	75 mm <sup>2</sup> ACSR conductor	✓	✓	-	
22	H-Pole wooden structures 33 kV 50 kVA	✓	✓	-	
23	H-Pole concrete structures 33 kV 50 kVA	✓	✓	-	
24	H-Pole wooden structures 11 kV 50 kVA	✓	✓	-	
25	H-Pole concrete structures 11 kV 50 kVA	✓	✓	-	
26	H-Pole wooden structures 33 kV 25 kVA	✓	✓	-	
27	H-Pole concrete structures 33 kV 25 kVA	✓	✓	-	
28	Single-pole wooden structures 11 kV 25 kVA	✓	✓	-	
29	Single-pole concrete structures 11 kV 25 kVA	✓	✓	-	
30	11 kV normal stay wooden	✓	✓	-	
31	11 kV normal stay concrete	✓	✓	-	
32	33 kV normal stay wooden	✓	✓	-	
33	33 kV normal stay concrete	✓	✓	-	
34	11 kV flying stay wooden	✓	✓	-	
35	11 kV flying stay concrete	✓	✓	-	
36	33 kV flying stay wooden	✓	✓	-	
37	33 kV flying stay concrete	✓	✓	-	
38	MV earthing	✓	✓	-	
39	Substation leads	✓	✓	-	

(Source: JICA Survey Team based on Request by the Kenyan side)

## (2) Transportation Plan

Distribution transformers procured in Japan will be shipped to the Mombasa Port and custom clearance will be done at Mombasa port or Inland Container Dept. (ICD) and the process need 14 days. After the custom clearance, they will be transported by trailer from Mombasa Port to the storage yards in Nakuru city or Mombasa city which are prepared by KPLC. The travel distance from Mombasa Port to the storage yard site in Nakuru city is about 630 km. Mombasa Road is a main highway and a major route for trailers, so there is no traffic problem. The transportation period from the shipping country to the storage yards is considered to be about 3 months.

Local procurement items are transported by inland transportation from each factory in Kenya to the storage yards. Local procurement items are transported and procured through multiple steps according to the work progress.

### 2-2-4-7 Operational Guidance Plan

In the survey, maintenance work of the failed transformer was carried out at the workshop of KPLC and

each equipment has a company code and painted at the storage yard, and they were managed by the inventory system of KPLC. In addition, overhead traveling crane in the warehouse are properly maintained without any rust or deterioration, it is judged that sufficient maintenance are carried out.

Since distribution equipment and materials supplied under the project are same at technical level and category as the equipment used in KPLC's existing distribution system, new technology and new structure are not necessary for operation and maintenance of the equipment of the project. It is judged that technology transfer and special budget planning will not be necessary.

**2-2-4-8 Soft Component (Technical Assistance) Plan**

Soft component (technical assistance) will not be necessary as mentioned in Chapter 2-2-4-7.

**2-2-4-9 Implementation Schedule**

The implementation schedule for the project is shown in Table 2.2-16.

Table 2.2-16 Implementation Schedule

Year		2019												2020												2021											
Month		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Contract	Exchange of Note (E/N)	▼																																			
	Grant Agreement (G/A)	▼																																			
	Consultant Contract	▼																																			
	Tendering Works	Review of Equipment Specification		■																																	
		Preparation of Tender Document			■																																
		Approval of Tender Document				■																															
		Tender Announcement					▼																														
		Tender						▼																													
Tender Evaluation							■																														
Contractor Contract								▼																													
Procurement Works	<b>Procurement of Equipment</b>																																				
	- Design								■	■																											
	- Manufacturing																																				
	- Factory Inspection, Sea and Inland Transportation																																				
	<b>Construction of Facilities</b>																																				
	<b>Nakuru County</b>																																				
	(1) Route survey																																				
	(2) Construction of Wooden Poles																																				
	(3) Construction of Concrete Poles																																				
	(4) Construction of Distribution Line																																				
	(5) Installation of Transformer																																				
	<b>Nyandarua County</b>																																				
	(1) Route survey																																				
	(2) Construction of Wooden Poles																																				
	(3) Construction of Concrete Poles																																				
	(4) Construction of Distribution Line																																				
	(5) Installation of Transformer																																				
	<b>Kilifi County</b>																																				
	(1) Route survey																																				
	(2) Construction of Wooden Poles																																				
	(3) Construction of Concrete Poles																																				
(4) Construction of Distribution Line																																					
(5) Installation of Transformer																																					
<b>Kwale County</b>																																					
(1) Route survey																																					
(2) Construction of Wooden Poles																																					
(3) Construction of Concrete Poles																																					
(4) Construction of Distribution Line																																					
(5) Installation of Transformer																																					
<b>Inspections and Taking over</b>																																					

(Source: JICA Survey Team)

**2-3 Obligations of Recipient Country**

Items to be arranged by the Kenyan side for the project are as follows:

- (1) Items to be arranged by the Kenyan side
  - 1) Arrangement on Tax Exemption
    - Arrangements shall be made to ensure quick and timely customs clearance and tax exemption

for procured equipment/materials, as well as exemption from value-added tax, personal income tax, corporate tax or related taxes imposed on services tendered by Japanese people or any corporate bodies engaged under the project. For imported goods and materials, tax will be exempted for the following items: Railway Development Levy (RDL<sup>4</sup>), Import Declaration Fee (IDF<sup>5</sup>), Customs Duty and Value Added Tax (VAT). For locally purchased goods, Value Added Tax (VAT) will be exempted. Income tax, corporate tax, local taxes, or related taxes imposed on services tendered by Japanese people or any corporate bodies engaged under the project shall be exempt subject to approval by the National Treasury (NT).

The procedure and items for tax exemption are described based on the information obtained so far as follows provided to be confirmed by Kenyan side.

#### (a) Procedure for Tax Exemption

There are mainly two steps in the procedure for tax exemption as shown in Fig 2-3-1. The first step is approval of the Master List, and second step is approval of tax exemption of specific consignment rendered for the project.

In the first step, Consultant and Contractor shall submit a Master List that covers all items related to the project such as equipment, installation work and consultancy Services to KPLC's Project Implementation Unit (PIU). KPLC will then make Application for Master List to the Cabinet Secretary of NT through the Ministry of Energy. NT will make decision for approval to the Application for Master List with consulting Kenya Revenue Authority (KRA) upon requested form KPLC. After that, approved Master List will be submitted to Consultant and Contractor through MOEn and KPLC as illustrated in Fig 2-3-1.

The above approval process for the Master List takes about 3 to 4 months.

In the second step, Consultant and Contractor shall submit application to KPLC for tax exemption of specific consignment of imported goods and materials, locally purchased goods and materials, constructions work of the equipment and consultancy services rendered. KPLC will make application for tax exemption of specific consignment rendered for the project to NT through MOEn.

Although the procedure from application for tax exemption to approval is same to the procedure of approval procedure of the Master List mentioned above, the approval process for tax Exemption of specific consignment takes about 3 weeks (21 days).

Therefore, the Consultant and Contractor should apply for tax exemption with official form attaching the approved Master List to KPLC at the appropriate time in advance taking the

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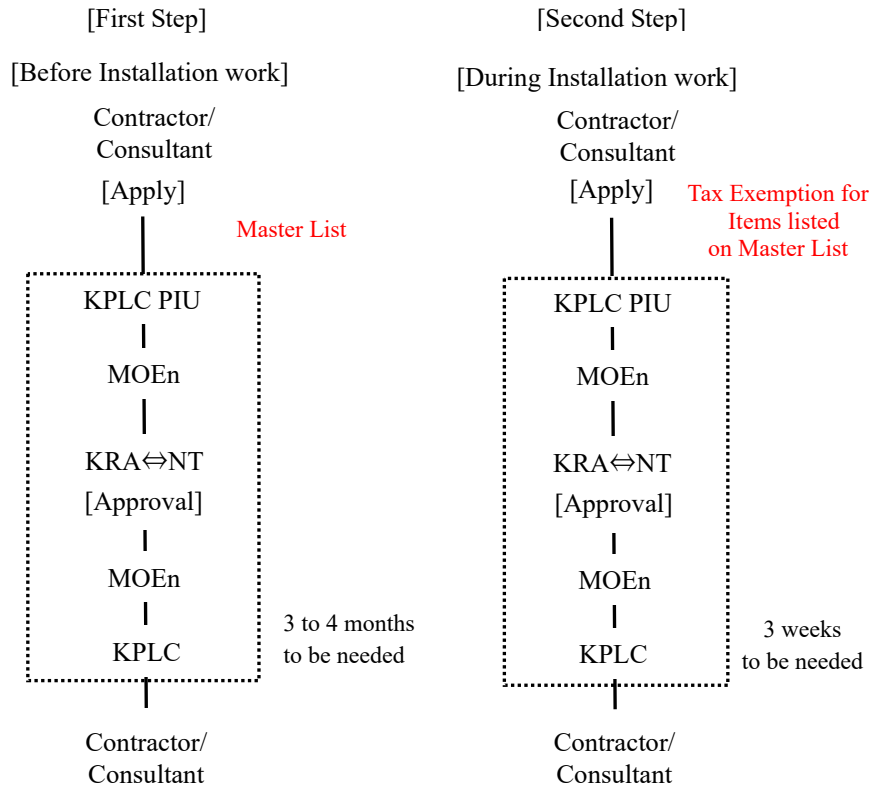
<sup>4</sup> RDL is utilized for development of new railway infrastructure

<sup>5</sup> IDF is utilized for importing process such as approval of imported goods and development of related documents etc.

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duration of approval process of about 3 weeks (21 days) into consideration under the management of the Consultant.



(Source: JICA Survey Team based on NT, other donors hearing)

Fig. 2.3-1 Application for Tax Procedure

(b) Target Items for Tax Exemption

Basically, related tax imposed by recipient country for rendering the service for the project should be target items for tax exemption as shown in Table 2.3-1.

As mentioned in Table 2.3.1, Consultant should apply for tax exemption of all possible items in accordance with their service of tendering and supervise of execution works rendered for the project. On the other hand, Contractor should apply for tax exemption of all possible items in accordance with their service of procurement and installation works as mentioned in Table 2.3.1 as well.

The explanation of each Tax for possible exemption is as follows.

- Railway Development Levy (RDL) : 1.5 %

Railway Development Levy (RDL) is imposed to all imported goods for raising the fund for new railway infrastructure. The tax rate is 1.5%.

- Import Declaration Form (IDF) : 2.25 %

Import Declaration Form (IDF) is imposed to all shipments for approval of imported goods and arranging the related document. The tax rate is 2.25% of CIF (Cost, Insurance & Freight) value with a minimum of 5,000 KES.

- Customs Duty : 0~100 %

Customs duty is calculated based on the applicable principles of customs valuation, tariff classification and rules of origin etc. Generally, the tax rate is varied from 0% to 100% with average value of around 25%. Regarding to the electric materials and equipment, the tax rate is relatively low, and it is considered the tax rate is varied from 0% to 35% with average value of around 10%. It is needed to identify the definite value of custom duty for imported goods case by case. For example, the tax rate for imported transformer is 0%.

- Withholding Tax : 3 or 5 %

Withholding Tax is imposed to the targeted service for remuneration of business operation or expert etc. The applicable tax rate is 3% for subcontractors and 5% for consultants respectively.

- Personal Income Tax : 5~30 %

The personal income tax is imposed to all benefits from work or service provided in Kenya based on the residence conditions. The personal income tax is applied gradually in the range of 5% to 30% according to the hierarchy of taxable income.

- Corporate Tax : 30% or 37.5 %

The corporate tax is imposed to the business income which are considered to have been raised in Kenya.

Corporate Tax for target companies is as follows;

- Corporate tax for Japanese company: 37.5 %

- Corporate tax for Local Company: 30 %

- Value Added Tax (VAT) : 16 %

The scope and coverage of VAT is broad since it applies to all imports, supplies, manufactured goods and services (labor) provided in Kenya.

The targets for Value Added Tax (VAT) are as follows;

- Normal goods and services etc. provided in Kenya except for ones which are exempted

- Imported goods and services

The tax rate is applied to 16% for normal supplies such as imported goods, construction equipment etc.

Table 2.3-1 Target items for tax exemption

	[Tax Rate]	Railway Construction Levy [RDL] [1.5%]	Import Declaration Fee [IDF] [2.25%]	Customs Duty [0~35%]	Withholding Tax [3~5%]	Personal Income Tax [5~30%]	Corporate Tax [30~37.5%]	Value Added Tax [VAT] [16%]
Materials and Equipment	Imported goods	A	-	A	-	-	-	A
	Locally purchased goods	A	-	A	-	-	-	A
Construction and Consultancy services	Japanese Company (Japanese Contractor /Consultant)	-	-	-	B	-	B	-
	Third Country Company (Third Country Contractor /Consultant)	-	-	-	C	-	C	-
	Local Company (Local Contractor /Consultant)	-	-	-	C	-	C	-
	Japanese	-	-	-	-	B	-	-
	Foreigner	-	-	-	-	C	-	-
	Local people	-	-	-	-	C	-	-

A: Tax exemption is applicable.

B: In general, Tax is not exempted generally. However, tax may be exempted upon request.

C: Tax exemption is not applicable.

-: No target

(Source: JICA Survey Team based on NT, other donors hearing)

Classification mentioned in Table 2.3.1 is prepared based on the general information obtained during this study. However, both Kenyan and Japanese side have confirmed in the M/D that all possible taxes imposed in the project should be exempted.

## 2) Expedient provision

Obtaining entry and stay permits for Japanese people or corporate bodies engaged in the project shall be arranged.

## 3) Documentation of banking arrangement and authorization to payment

The processing of B/A, issuance of A/P, and payment of charges under the project shall be arranged.

## (2) Undertaking of the Recipient Country

### 1) Before the project execution

a) Provision of a temporary storage yard with gate and fence for all project sites

### 2) During the project execution

a) Nomination and allocation of responsible persons from KPLC for coordination of power shutdown

b) Provision of adequate security by KPLC for Japanese engineers when working around Mombasa city

c) Installation and connection of the service cable from LV line to the households, including fuse cut-out and meter box

- d) Explanation and consensus from the resident when wayleaves acquisition (damage or removal to personal trees, crops, structures etc.) occurs
- 3) After the project execution
  - a) Securing budget and staff to operate appropriately and efficiently and maintain the subject materials and equipment provided under the grant aid

## 2-4 Project Operation Plan

After completion of the project, the distribution facilities will be operated by the Network Management Department in KPLC. The O&M for the distribution networks around Nakuru city and around Mombasa city will be managed by the Nakuru Station and the Mombasa Station respectively.

Regarding the present situation of O&M for the existing distribution facilities by KPLC, it can be confirmed that proper maintenance has been implemented without any particular problems or occurrences of any accidents and troubles.

The main tasks of O&M are as follows:

- a) Response to incidents of power failure and restoration of powers
- b) Maintenance and inspection work: routine maintenance and inspection required for equipment

General maintenance/inspection work consists of patrol within a period of about one month and periodic inspections performed within a period of about six months. Patrols and inspection items are shown in Table 2.4-1 below. We assume that KPLC will do similar work after the project.

Table 2.4-1 Items of Daily Patrol and Periodic Inspection

Items	Daily Patrol (One month interval)	Periodic Inspection (Six months interval)
Transformer	(Visual Inspection) • Abnormal noise/vibration • Temperature rise • Oil leakage	(in addition to visual inspection) • Insulation oil pressure test (sampling inspection) • Cleaning
Other distribution equipment	(Visual Inspection) • Inspection of damage	(in addition to visual inspection) • Loose check or tightening adjustment of stay wire • Inspection of meter box • Clearance check of distribution lines to trees etc. • Cleaning

(Source: JICA Survey Team based on KPLC Hearing)

## 2-5 Project Cost Estimation

### 2-5-1 Initial Cost Estimation

#### (1) Expenses Borne by the Kenyan Side

In case the project is executed under a grant aid, expenses to be borne by the Kenyan side are shown in

Table 2.5-1.

Table 2.5-1 Expenses Borne by the Kenyan Side

Item	Cost [million KES]	Remark
1) Execution of environmental screening	0.60	
2) Execution of environmental monitoring	0.60	
3) Provision of a temporary storage yard with gate and fence for all project sites	1.9	Property of KPLC to be used
4) Dispatch of armed police officers when a Japanese engineer stays around Mombasa city	0.55	Personnel of KPLC to be used
5) Installation and connection of the service cable from LV line to the households, including fuse cut-out and meter box	220.0	Connecting fee of service cable to be paid by recipient
Total	223.65	

(Source: JICA Survey Team based on KPLC hearing)

In addition to the above, expenditures for the B/A and A/P to obtain an import permit from the government will be arranged. For smooth execution of such duties, the Kenyan side needs to secure the required budget in advance.

## 2-5-2 Operation and Maintenance Cost

### (1) Assignment Plan for O&M Staff

The assignment plan of the O&M staff for equipment of the project is estimated as shown in Table 2.5-2. It is necessary to ask KPLC to allocate O&M personnel for the project.

Table 2.5-2 Assignment Plan for O&amp;M Staff

Project Site	Person in-charge	Number	Remark
Around Nakuru City (Nakuru County/Nyandarua County)	- Engineer	2	Each county
	- Technician	13	
Around Mombasa City (Kilifi County/Kwale County)	- Engineer	2	Each county
	- Technician	7	
Total		24	

(Source: JICA Survey Team based on KPLC hearing)

### (2) Operation and Maintenance Cost

The annual maintenance cost for subject distribution facilities is estimated as shown in Table 2.5-3.

Table 2.5-3 O&amp;M Cost

Items		Cost
Around Nakuru City (Nakuru County/Nyandarua County)	1) Personnel expenses	KES 7.2 million
	2) Equipment maintenance fee	KES 0.7 million
Around Mombasa City (Kilifi County/Kwale County)	1) Personnel expenses	KES 10.1 million
	2) Equipment maintenance fee	KES 2.4 million
Total		KES 20.4 million

(Source: JICA Survey Team based on KPLC hearing)

The estimated total annual maintenance cost is KES 20.4 million. Considering that KPLC's distribution facilities are maintained without any problems, the JICA Survey Team considered that KPLC is capable of securing sufficient annual O&M cost for subject distribution facilities.

**Chapter 3**  
**Project Evaluation**





## Chapter 3 Project Evaluation

### 3-1 Preconditions

In implementing the project, the Kenyan side is required to undertake the following administrative matters and arrangements securely and timely:

- 1) KPLC shall get permission for conducting EIA from National Environment Management Authority (NEMA) prior to the commencement of the project.
- 2) Compensation to the Project Affected Persons (PAPs) should be conducted prior to the commencement of the project.
- 3) Securing land for wayleaves in the distribution network project for the four counties.
- 4) Provision of temporary storage yard for all project sites.
- 5) Nomination and allocation of responsible person from KPLC for the power shutdown works.
- 6) Overall coordination of the project.

### 3-2 Necessary Inputs by Recipient Country

Currently, KPLC is capable of conducting the O&M of existing facilities without any problem. However, it seems necessary to arrange the following due to the rapid enhancement and expansion of the distribution power system through LMCP, which is targeting 100% accessibility of electricity by the end of 2022 as specified by the Kenyan government policy.

- 1) Arrangement of additional staff and securing of proper budget for the O&M with the enhancement of the distribution network.
- 2) Installation and connection of the service cable from LV line to the households during the project execution.
- 3) Explanation and consensus from the resident when wayleaves acquisition (damage or removal to personal trees, crops, structures etc.) occurs

### 3-3 Project Evaluation

#### 3-3-1 Relevance

It is expected that the project will contribute to the increase of the present electrification rate through the reinforcement of the distribution networks in the four counties of Nakuru, Nyandarua, Kilifi, and Kwale. Moreover, the project is also expected to contribute to the reduction of distribution losses and greenhouse gases by utilizing the low-loss type distribution transformer.

Therefore, it is expected to contribute not only to the improvement of the living conditions of inhabitants in the target area of the project, but also to the mitigation of global warming. Considering this, it is judged that the relevance of the implementation of the project is very high.

### 3-3-2 Effectiveness

The beneficial effects (i.e., quantifiable effects and qualitative effects) expected from the project are as follows:

#### (1) Quantifiable Effects

The quantifiable effects from the project are shown in Table 3.3-1. These will bring about an increase of electricity sales of KPLC and it is expected to contribute improvement of income of KPLC.

Table 3.3-1 Quantifiable Effects by the Project

Evaluation	Final Target	Explanation
1) Increase of New Customers	14,671 households (73,355 persons)	The purpose of the project is electrification in areas without electric power, in accordance with LMCP.
2) Increase of Electricity Sales	6,462 [MWh/year]	It is expected to increase electricity sales energy through the newly electrified customers brought by the project.
3) Reduction of Distribution Losses	157.5 [MWh/year]	Reduction of distribution losses is expected through the introduction of the low-loss type distribution transformer for the project.
4) Reduction of CO <sub>2</sub> Emission	10.7 [ton-CO <sub>2</sub> /year]	Reduction of CO <sub>2</sub> emission is expected through reduction of distribution losses.

(Source: JICA Survey Team)

The calculation method for the above quantifiable effects is mentioned below.

#### 1) Increase of new customers due to the expansion of the distribution network

New customers, i.e., 14,671 households or 73,355 persons, are expected to be provided with power services through the project. The number of households in each county is shown in Table 3.3-2.

Table 3.3-2 Number of New Customers by Each County

	Nakuru	Nyandarua	Kilifi	Kwale	Total	Remarks
Households	3,656	3,386	5,042	2,587	14,671	From the result of the survey
Persons	18,280	16,930	25,210	12,935	73,355	Assume 5 persons per household

(Source: JICA Survey Team)

The number of households seems to gradually increase toward the target number; however, it is assumed that the actual number of households would be around 70% of the target number (i.e., 14,671 households) at the project completion stage based on the actual progress of Phase I of LMCP as mentioned in Table 3.3-3.

Table 3.3-3 Actual Progress of LMCP [Phase I]

	Number of Customers [house]	Length of Conductors [km]	Number of Poles [pole]	Remark
Target	224,952	11,767	265,313	About 70% progress
Actual Progress	103,667	9,147	209,424	

(Source: JICA Survey Team)

The actual progress of the project should be monitored through progress reports conducted by KPLC.

## 2) Increase of electricity sales

The following increase in electricity sales of KPLC is expected in accordance with the increase of new customers mentioned previously. The increase in electricity energy is assumed to be 6,462 MWh per year, which is estimated based on the average power consumption of new customers and existing customers from each county mentioned in Table 3.3-4.

The contribution to increase of sales electric energy in Nyandarua County seems to be relatively high compared with other counties.

Table 3.3-4 Increase of Annual Electric Demand and Contribution Rates to Power Demand

		Nakuru	Nyandarua	Kilifi	Kwale	Total	Remarks
New customers [households]		3,656	3,386	5,042	2,587	14,671	From the result of survey
Power Demand	As of 2017 [GWh/year]	550.24	47.04	444.92	192.70	1,234.9	Data from KPLC
	Growth Rate [%]	4.82	7.43	6.28	6.14	-	
	Average Power Consumption of Customer [kWh/year]	440.44				-	Data from KPLC load factor about 60%
Increase of Sales Energy [GWh/year]		1.610	1.491	2.221	1.139	6.462	
Contribution Rates to Power Demand Increase [%]		0.29	3.17	0.50	0.59	0.52	

(Source: JICA Survey Team)

## 3) Reduction of distribution losses

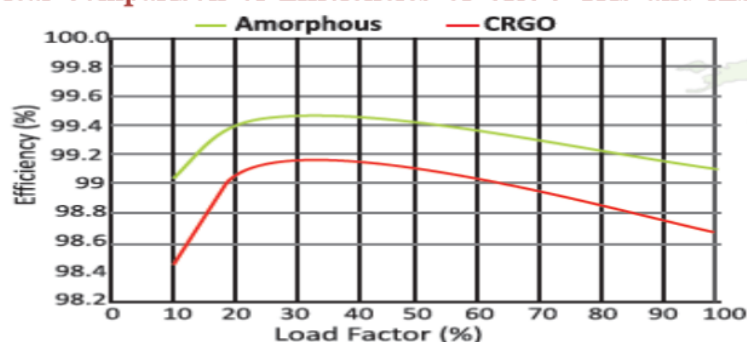
Low-loss type distribution transformers are planned to be introduced in the project. The benefit of KPLC would be expected through the reduction of the distribution losses in each county. However, it is difficult to evaluate the effect of distribution losses by actual measurement due to the small number of installations of low-loss type distribution transformers compared with the total existing distribution network. So, the effect is estimated using the following steps.

### Step 1: Introduction effect per low-loss type distribution transformer

It is expected that the effect is the reduction of loss of around 1,445 kWh per year through the

introduction of one low-loss type distribution transformer due to high efficiency (0.28%), compared with the conventional type transformer as shown in Table 3.3-5 and Table 3.3-6.

### Typical Comparison of Efficiencies of CRGO Trfs and AMDTs



(Source: Document of Transformer Maker)

Figure 3.3-1 Specification of Low-loss Type Transformer

Table 3.3-5 Comparison of Distribution Transformers

			Distribution Transformer (50 kVA)	
			Low-loss type	Conventional type
Specification	Efficiency [%]	At load factor 100% (8 hours)	99.10	98.67
		At load factor 60% (16 hours)	99.33	99.05
	Power loss	[kWh/day]	8.96	12.92
	Difference	[kWh/day]	3.96	
			[kWh/year]	
			1,445	
Cost	Unit	[Ksh/unit]	300,000	250,000
	Difference	[Ksh/unit]	50,000	

(Source: JICA Survey Team)

Step 2: The number of low-loss type distribution transformers introduced through the project and reduction of power loss per year

Low-loss type distribution transformers are planned to be introduced in the project. It is expected to reduce the distribution losses by 157.5 MWh per year as shown in Table 3.3-7.

Table 3.3-6 Introduction of Low-loss Type Distribution Transformers and Reduction of Power Loss Per Year

	Nakuru	Nyandarua	Kilifi	Kwale	Total	Remark
Number of low-loss type transformers introduced [no.]	49	35	14	11	109	From the result of the survey
Reduction of power loss per year [MWh/year]	70.8	50.6	20.2	15.9	157.5	

(Source: JICA Survey Team)

#### 4) Reduction of CO<sub>2</sub> emission due to the reduction of distribution losses

One of the benefits of the project is the reduction of distribution losses. Therefore, the reduction of CO<sub>2</sub> emission due to the project is estimated through the following steps based on the reduction of distribution losses resulting from the introduction of low-loss type distribution transformers.

The effect of reduction of distribution losses is expected to be around 1,57.5 MWh per year due to the introduction of low-loss type distribution transformers in the project, as mentioned previously. CO<sub>2</sub> emissions with this amount of electric power from the existing power plant are reduced through the low-loss type distribution transformer in the project.

#### Step 1 : Generated power energy by generator type of power grid in Kenya

The CO<sub>2</sub> emission factor for KPLC's power grid is not clear; therefore, the CO<sub>2</sub> emission factor for power grids in Kenya is assumed based on the current power generation amount and the general CO<sub>2</sub> emission factor by generator type as mentioned in Table 3.3-6.

Table 3.3-7 Generated Power Energy by Generator Type of Power Grid in Kenya [2017]

Generator type	Hydro	Thermal		Geo Thermal	Wind	Total
		Diesel	Gas			
Annual generated energy [GWh]	3,339	723	108	3279	63	7,512
Emission factor [ton-CO <sub>2</sub> /MWh]	-	0.66	0.43	-	-	

(Source: JICA survey team based on the data issued by the Ministry of the Environment in Japan)

#### Step 2 : Emission factor of power grid in Kenya

The emission factor of the power grid in Kenya is estimated by average weight, utilizing the generated energy and emission factor by the generator type mentioned above.

The emission factor of the power grid in Kenya is 0.0679 [ton-CO<sub>2</sub>/MWh], which is calculated as follows:

$$=(0.66 \text{ [ton-CO}_2\text{/MWh]} \times 723 \text{ [GWh]} + 0.43 \text{ [ton-CO}_2\text{/MWh]} \times 108 \text{ [GWh]}) / 7,512 \text{ [GWh]}$$

Using this emission factor, the estimated reduction in CO<sub>2</sub> emission resulting from the project is 10.7 ton-CO<sub>2</sub> per year (=157.5 [MWh/year] × 0.0679 [ton-CO<sub>2</sub>/MWh]).

The reason for the low reduction effect of CO<sub>2</sub> emission in the project is the small number of low-loss type distribution transformers introduced. The low CO<sub>2</sub> emission factor of the power grid in Kenya due to the large amount of power energy is generated by hydro generators and geothermal generators. The electricity demand in Kenya is increasing rapidly, so if the number of low-loss type distribution transformers introduced is increased up to around 10% of the total distribution transformers within around 10 years hereafter subject to the introduction policy of low-loss type distribution transformers in Kenya. The reduction of CO<sub>2</sub> emission is estimated to

be around 70 ton-CO<sub>2</sub> per year, as mentioned in Table 3.3-8.

Therefore, it is strongly recommended to introduce low-loss type distribution transformers hereafter from the viewpoint of less environmental impact and economic side.

Table 3.3-8 Estimated Reduction of CO<sub>2</sub> Emission in the Future

	Nakuru	Nyandarua	Kilifi	Kwale	Total	Remark
Number of existing transformers [no.]	3,311	1,588	1,301	885	7,085	From the result of the survey
Number of low-loss type transformers introduced [no.]	49	35	14	11	109	
Number of low-loss type distribution transformer to be introduced in the future [no.]	719 (=(7085 [no.] + 109 [no.]) × 0.1)					In case of increase of low-loss type distribution transformers up to around 10% of total distribution transformers
Reduction of CO <sub>2</sub> Emission [ton-CO <sub>2</sub> /year]	70.5 (=1.445 [MWh/unit·year] × 719 [unit] × 0.0679 [ton-CO <sub>2</sub> /MWh])					

(Source: JICA Survey Team)

## (2) Qualitative Effects

The expected qualitative effects of the project are discussed below.

### 1) Beneficial effects to general customers

Judging from the current consumption of electric energy per household of around 100 W, it is estimated that the electricity demand of a new customer will be same and new customers will first utilize electrical light, replacing the kerosene lamps currently used. Owing to this, it is expected to have improvements in the living conditions and education level by enhancing the study environment of children.

In addition, it will be possible to use radios, televisions, and computers with high demand. The information available is excellent in quantity, quality, and simultaneity, and it is expected to directly benefit the improvement of the livelihood level of households.

### 2) Beneficial effects to public facilities and commercial facilities

Although it seems difficult to specify clearly, it is expected that electricity would contribute to the enhancement of regional economy and accessibility to information, for example through the promotion of sales of fresh, chilled, high-value products, and digital learning using computers in schools.

In addition, electricity is expected to contribute to the decline in crime if lighting of public areas is completed. Thus, it is judged that the relevance of the project is very high.

## **Appendices**

- 1. Member List of the Study Team**
- 2. Study Schedule**
- 3. List of Parties Concerned in the Recipient Country**
- 4. Minutes of Discussions**
- 5. Environmental and Social Considerations**
- 6. Drawings**





***Appendix-1***

***Member List of the Study Team***



Member List of the Study Team

1. Mr. Eiji WAKAMATSU (1<sup>st</sup> and 3<sup>rd</sup> Field Survey)  
Team Leader  
(Deputy Director, Team 2, Energy and Mining Group, Industrial Development and Public Policy Department, JICA)
2. Mr. Takayoshi MIYAZAKI (1<sup>st</sup> & 3<sup>rd</sup> Field Survey)  
Planning Management  
(Special Advisor, Team 2, Energy and Mining Group, Industrial Development and Public Policy Department, JICA)
3. Mr. Yukao TANAKA (1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> Field Survey)  
Chief Consultant / Power Distribution System Planning  
(NIPPON KOEI Co., Ltd.)
4. Mr. Toshinari UEMURA (1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> Field Survey)  
Power Distribution System 1  
(NIPPON KOEI Co., Ltd.)
5. Mr. Shinya MAETA (1<sup>st</sup> & 2<sup>nd</sup> Field Survey)  
Power Distribution System 2  
(NIPPON KOEI Co., Ltd.)
6. Mr. Yusuke KOMASAKI (1<sup>st</sup> & 2<sup>nd</sup> Field Survey)  
Equipment Procurement Planning / Cost Estimation  
(NIPPON KOEI Co., Ltd.)
7. Mr. Shinjiro OKUZAWA (1<sup>st</sup> & 2<sup>nd</sup> Field Survey)  
Environmental and Social Consideration  
(A.S. ENGINEERING Co., Ltd.)



***Appendix-2***  
***Study Schedule***



## Schedule for 1st Field Survey

No.	Date	Day	JICA		Consultants						
			Eiji WAKAMATSU Team Leader	Takayoshi MIYAZAKI Study Planning	Yukao TANAKA Chief Consultant / Power Distribution System Planning	Toshinari UEMURA Power Distribution System 1	Shinya MAETA Power Distribution System 2	Yusuke KOMASAKI Equipment Procurement Planning / Cost Estimation	Shinjiro OKUZAWA Environmental and Social Consideration		
1	9-Apr	Mon			<b>Departure from Japan</b>						
2	10-Apr	Tue			<b>Arrival in Nairobi</b>						
3	11-Apr	Wed			Arrival report (JICA Kenya office), Courtesy call (National Treasury) Explanation of Survey Outline and Coordinating meeting (MOEn, Kenya Power)			Discussion with procurement department (Kenya Power)	Discussion with environmental department (Kenya Power)		
4	12-Apr	Thu			Discussion with procurement department (Kenya Power)	Discussion with technical department (Kenya Power)		Discussion with procurement department (Kenya Power)	Discussion with environmental department (Kenya Power)		
5	13-Apr	Fri			Hearing for donors (WB, AfDB, etc.)	Meeting with local assistant		Hearing for donors (WB, AfDB, etc.)	Explanation of TOR and estimation of local reconignment		
6	14-Apr	Sat		<b>Departure from Japan</b>	Internal meeting, Preparation of field survey						
7	15-Apr	Sun		<b>Arrival in Nairobi</b>	Preparation of field survey		<b>Travel (Nairobi → Mombasa)</b>	Preparation of field survey	<b>Travel (Nairobi → Mombasa)</b>		
8	16-Apr	Mon		JICA Kenya office <b>Travel (Nairobi → Mombasa)</b>	Preparation of field survey <b>Travel (Nairobi → Mombasa)*</b> accompany JICA	Field survey (Contents of project, Demand, Customer, Supply reliability, etc. in Nakuru County)	Field survey (Contents of project, Demand, Customer, Supply reliability, etc. in Kwale County)	Estimation for local materials and labor cost (at least 3 contractor)	Field survey (Kwale, Kilifi County)		
9	17-Apr	Tue		Field survey (Kwale County)	Field survey (Kwale County) * accompany JICA	Field survey (Distribution network Distribution facility, Scope of work, Substation in Nakuru County)	Field survey (Distribution network Distribution facility, Scope of work, Substation in Kwale County)				
10	18-Apr	Wed		<b>Departure from Japan</b>	Field survey (Kilifi County)	Field survey (Kilifi County) * accompany JICA	Field survey (Contents of project, Demand, Customer, Supply reliability, etc. in Kilifi County)	Estimation for local inland cost (at least 3 transport company)	<b>Travel (Mombasa → Nairobi)</b>		
11	19-Apr	Thu		<b>Arrival in Nairobi</b> JICA Kenya office	<b>Travel (Mombasa → Nairobi)</b>	<b>Travel (Mombasa → Nairobi)*</b> accompany JICA	Field survey (Contents of project, Demand, Customer, Supply reliability, etc. in Nyandarua County)	Field survey (Distribution network Distribution facility, Scope of work, Substation in Kilifi County)	Field survey (Nakuru, Nyandarua County)		
12	20-Apr	Fri		Call, Meeting (Other project) Call, Meeting (KPLC)	Preparing field survey report Call, Meeting (KPLC)	Field survey (Distribution network Distribution facility, Scope of work, Substation in Nyandarua County)					
13	21-Apr	Sat			Organizing field survey results/data, Preparing reports		<b>Travel (Mombasa → Nairobi)</b> Organizing field survey results/data, Preparing reports	Organizing field survey results/data, Preparing reports, Discussion with local consultants			
14	22-Apr	Sun			Organizing field survey results/data, Preparing reports, Follow up meetings (project scope, environment, procurement, etc.)						
15	23-Apr	Mon		Meeting (Other project) Signature of M/D, Courtesy call and Report (Embassy), Departure from Nairobi	Report results of field survey (MOEn, Kenya Power) Signature of M/D, Courtesy call and Report (Embassy)		<b>Arrival in Japan</b>				
16	24-Apr	Tue		<b>Arrival in Japan</b>	Additional survey for following up the M/D of the meeting Remaining survey such as hearing for donors and Local assistance						
17	25-Apr	Wed			Supplement Meeting with related organization for completing the questioners and so on. Discussion with the local assistants and Instruction to the local assistants during the absent of the study team Preparing field survey report and report the survey result to Kenya JICA office						
18	26-Apr	Thu			<b>Departure from Nairobi</b>						
19	27-Apr	Fri			<b>Arrival in Japan</b>						

## Schedule for 2nd Field Survey

No.	Date	Day	JICA		Consultants				
			Eiji WAKAMATSU Team Leader	Takayoshi MIYAZAKI Study Planning	Yukao TANAKA Chief Consultant / Power Distribution System Planning	Toshinari UEMURA Power Distribution System 1	Shinya MAETA Power Distribution System 2	Yusuke KOMASAKI Equipment Procurement Planning / Cost Estimation	Shinjiro OKUZAWA Environmental and Social Consideration
1	24-Jun	Sun			<b>Departure from Japan</b>				
2	25-Jun	Mon			<b>Arrival in Nairobi</b>				
3	26-Jun	Tue			8:30-Safety Briefing, Arrival report (JICA Nairobi office), 11:30-Meeting (Kenya Power) ----- 15:00- Meeting (MOEn)				
4	27-Jun	Wed			Internal meeting, Preparation of field survey, Meeting with Local assistance etc. ----- 14:00- Technical meeting (Kenya Power)			Hearing on procurement (tax exemption etc.)	
5	28-Jun	Thu			Internal meeting, Joint discussion with Local assistants and Local reconignment			Estimation for local materials and labor cost (at least 3 contractor)	
6	29-Jun	Fri			Preparation of field survey, Meeting with Local assistance etc.		10:00- Technical meeting (Kenya Power)	Estimation for local materials and labor cost (at least 3 contractor)	<b>Departure from Japan</b>
7	30-Jun	Sat			Correction of survey documents and data			Organizing field survey results/data, Preparing reports	<b>Arrival in Nairobi</b>
8	1-Jul	Sun			Correction of survey documents and data		<b>Travel (Nairobi → Mombasa)</b>	Organizing field survey results/data, Preparing reports	Meeting with Local assistants and distribution design team
9	2-Jul	Mon			Discussion about pending issue etc. with related department ----- Hearing on procurement (tax exemption etc.)(JICA Nairobi office)	<b>Move (Nairobi → Nakuru)</b> ----- Field survey in Nakuru County(Planned project site)	Field survey in Kilifi County(Planned project site, AFD site, Meeting with KPLC Engineer)	Hearing on procurement (tax exemption etc.)(JICA Nairobi office)	Discussion for tentative result of IEE with related department
10	3-Jul	Tue			Preparation of the revised draft MD. Contact with related persones about Tax Ezemtion etc	Field survey in Nakuru County (Meeting with KPLC Engineer) ----- Field survey in Nyandarua County (Meeting with KPLC Engineer)	Field survey in Kwale County(Planned project site, AFD site, Meeting with KPLC Engineer)	Discussion for product cost etc with related department ----- Estimation for local procurement cost (at least 3 company)	Discussion for tentative result of IEE with related department ----- Discussion for Environmental Report with Local Consultant
11	4-Jul	Wed			Preparation of the revised draft MD. Contact with related persones about Tax Ezemtion etc	Field survey in Nakuru County ----- Meeting with KPLC Engineer in Nyandarua County	Meeting with KPLC GIS Engineer & Contractor, Visit central warehouse	Estimation for local procurement cost (at least 3 company)	Hearing about compensation for Wayleave with related department
12	5-Jul	Thu			Discussion about Pending issues with EIB ----- Discussion for the MD with KPLC Discussion for the MD with MOEn	Field survey in Nyandarua County (Planned site & Completed site by other donor)	Meeting with Contractor and Sub-contractor, Visit site storage	Discussion for product cost etc with related department ----- <b>Departure from Nairobi</b>	Discussion for Environmental Issues with related department and Local Consultant
13	6-Jul	Fri			Discussion with the Japanes company about Tax Exemption ----- Discussion with Local persones about pending issues Data collection&preparation of the RT	Field survey in Nyandarua County (Completed site by other Donor, Meeting with KPLC Engineer)	<b>Travel (Mombasa → Nairobi)</b>	<b>Arrival in Japan</b>	Data collection and preparation of the report ----- <b>Departure from Nairobi</b>
14	7-Jul	Sat			Organizing field survey results/data, Preparing reports	<b>Move (Nakuru → Nairobi)</b> ----- Organizing field survey results/data, Preparing reports	Organizing field survey results/data, Preparing reports		<b>Arrival in Japan</b>
15	8-Jul	Sun			Organizing field survey results/data, Preparing reports				
16	9-Jul	Mon			Meeting with related counterpart for project configuration/scope and MD etc. ----- Organizing field survey results/data, Preparing reports and Bringing final MD to JICA Kenya Office				
17	10-Jul	Tue			Report results of field survey (MOEn, Kenya Power) ----- 10:30 ~ Signature of MD				
18	11-Jul	Wed			Preparing field survey report, Follow up and Supplement meetings with local assistants				
19	12-Jul	Thu			10:30-Reporting the outcome of the mission to JICA Kenya Office ----- <b>Departure from Nairobi</b>				
20	13-Jul	Fri			<b>Arrival in Japan</b>				



## Schedule for 3rd Field Survey

No.	Date	Day	JICA		Consultants	
			Eiji WAKAMATSU Team Leader	Takayoshi MIYAZAKI Study Planning	Yukao TANAKA Chief Consultant / Power Distribution System Planning	Toshinari UEMURA Power Distribution System 1
1	1-Dec	Sat	Departure from Japan			
2	2-Dec	Sun	Arrival in Nairobi		Departure from Japan	
3	3-Dec	Mon	Arrival report and Courtesy call (JICA Kenya office)		Arrival in Nairobi	
			Coordination with concerned parties (KPLC, MOEn)		Arrival report and Courtesy call (JICA Kenya office)	
4	4-Dec	Tue	Discussion and explanation regarding M/D (Kenya Power)		Discussion and explanation regarding M/D (Kenya Power)	
5	5-Dec	Wed	Discussion and Signature regarding M/D (KPLC, MOEn)		Discussion and Signature regarding M/D (KPLC, MOEn)	
					Revision of Draft final report (NK office)	
6	6-Dec	Thu	Attendance of Kenya National Electrification Strategy		Revision of Draft final report and rganizing field survey results (NK office)	
7	7-Dec	Fri	Attendance of Kenya National Electrification Strategy (17:00 closing)		Arrival in Japan	
			Departure from Nairobi			
8	8-Dec	Sat	Arrival in Japan			



## **Appendix-3**

### ***List of Parties Concerned in the Recipient Country***



List of Parties Concerned in the Recipient Country

**Ministry of Energy(MOE)**

1. Dr. Joseph NJOROGE –Principal Secretary(PS)
2. Eng. Richard MUIRU – Senior Advisor/Consultant
3. Eng. Julius MWATHANI - Head of Electrical Power Development
4. Eng. Richard MUIRU – Senior Advisor/Consultant
5. Eng. Isaac KIVA - Secretary Renewable Energy

**Ministry of Finance**

1. Mr. Jackson KINYANJUI – Director of External Resources
2. Mr. Charles MUTISO – Senior Assistant Director/ Head Asia & Pacific Division
3. Mr. Albert GITONGA

**Kenya Power & Lighting Company Ltd.(KPLC)**

1. Dr. Kenneth TARUS (Phd)- Managing Director (MD) and Chief Executive Officer (CEO)
2. Eng. Daniel TARE- General Manager Network Management and Acting General Manager Infrastructure Development
3. Eng. Nicholas BUNDOTICH- Engineer Last Mile Project
4. Eng. Mary KIRUI, Contract Manager, Last Mile Project -World Bank (IDA) Funded Component
5. Eng. John NJIHIA, Contract Manager, Last Mile Project – European Union(EU), European Investment Bank (EIB), French Development Agency (AFD) Funded Component
6. Mr. Nicholas BUNDOTICH – Project Engineer, Last Mile Project
7. Mr. Albert Ogetto MOGIRE – Design Engineer, Last Mile Project
8. Eng. Eraustu KITUJA – Power System Planning Manager
9. Mr. Wilfred KOECH - Environmental and Social Specialist, Safety, Health and Environment Department (SHED)
10. Mr. Simon Nguta MWANGANGI - Environmental and Social Specialist, Environmental and Social Section, SHED
11. Ms. Roseline - Socio-economist, SHED
12. Mr. Julius MARETE - Chief Wayleave Officer
13. Mr. Julius SACHO - Wayleave Officer

**World Bank (WB)**

1. Ms. Laurencia Karimi NJAGI– Senior Energy Specialist
2. Eng. Stanley MUTWIIRI- Consultant

**European Investment Bank (EIB)**

1. Mr. Kiragu MUGWE – Energy Sector Engineer

**African Development Bank (AfDB)**

1. Mr. Alemayehu WUBUSHET – Chief Regional Power System Officer
2. Mr. Seungsoo (Jason) JIN – Regional Power Sector Expert



***Appendix-4***

***Minutes of Discussions***

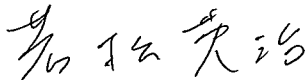




**Minutes of Discussions  
for the Preparatory Survey  
of the Project for Improvement of Power Distribution System around Nairobi City  
in the Republic of Kenya**

In response to the request from the Government of the Republic of Kenya (hereinafter referred to as “Kenya”), Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as “the Team”) for the Project for Improvement of Power Distribution System around Nairobi City (hereinafter referred to as “the Project”) to Kenya. The Team held a series of discussions with the officials of the Government of Kenya and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

23rd April, 2018  
Nairobi, Kenya



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Mr. Eiji Wakamatsu  
Leader  
Preparatory Survey Team  
Japan International Cooperation Agency  
Japan



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Dr. Kenneth Tarus, PhD  
Managing Director and CEO  
Kenya Power  
Kenya

Witnessed by



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Dr. Eng. Joseph Njoroge, CBS  
Principal Secretary  
Ministry of Energy  
Kenya

## ATTACHMENT

### 1. Project Objective

The Project objective is to reinforce power distribution networks by providing electrical facilities such as transformers, poles, wires and cables, thereby contributing to accelerate electrification in the Project sites.

### 2. Title of the Preparatory survey

Both sides confirmed the title of the survey as the Preparatory Survey for the Project for Improvement of Power Distribution System around Nairobi City.

### 3. Project sites

Both sides confirmed that the Project sites are in Nakuru County, Nyandarua County, Kilifi County and Kwale County, as shown in Annex 1.

### 4. Responsible authorities for the Project

Both sides confirmed that the authorities responsible for the Project are as follows:

4-1. Kenya Power will be the Executing Agency for the Project (hereinafter referred to as “the Executing Agency”). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project. It shall also ensure that the undertakings for the Project are managed by relevant authorities properly and on time. The organization charts are shown in Annex 2.

4-2. The line ministry of the Executing Agency is the Ministry of Energy. The Ministry of Energy shall be responsible for supervising the Executing Agency on behalf of the Government of Kenya.

### 5. Items requested by the Government of Kenya

5-1. As a result of the discussions, both sides confirmed that the items requested by the Government of Kenya are as follows. :

No.	Description	No.	Description
1	10mm <sup>2</sup> PVC Insulated Single Phase Concentric Aluminium Cable With Two Core Copper Communication Cable	24	75sqmm ACSR Conductor
2	25sqmm 4/C Cable	25	3PH. LV Circuits
3	Conductor 50mm <sup>2</sup> AA hd bare	26	1PH. LV Circuits
4	Cutout Service 1P+N 60/80A(Double)	27	H-Pole Wooden Structures 33kV 50kva
5	LV Stay Wooden Complete	28	H-Pole Concrete Structures 33kV 50kva
6	LV Stay Concrete Complete	29	H-Pole Wooden Structures 11kV 50kva
7	LV Wooden Pole Fitting	30	H-Pole Concrete Structures 11kV 50kva
8	LV Concrete Pole Fitting	31	H-Pole Wooden Structures 33kV 25kva

1 X

10

2

9	MV Wooden Pole Fittings	32	H-Pole Concrete Structures 33kV 25kva
10	MV Concrete Pole Fittings	33	Single-Pole Wooden Structures 11kV 25kVA
11	Service Cable Wooden fittings	34	Single-Pole Concrete Structures 11kV 25kVA
12	Service Cable Concrete fittings	35	11kV Normal Stay Wooden
13	Pole Wood Treated 10.0m	36	11kV Normal Stay Concrete
14	Pole Concrete 10.0m	37	33kV Normal Stay Wooden
15	Pole Wood Treated 11.0m	38	33kV Normal Stay Concrete
16	Pole Concrete 11.0m	39	11kV Flying Stay Wooden
17	Pole Wood Treated 12.0m	40	11kV Flying Stay Concrete
18	Pole Concrete 12.0m	41	33kV Flying Stay Wooden
19	Protective Multiple Earthing (PME)	42	33kV Flying Stay Concrete
20	Transformer 50kVA 33/433kV (Low-loss type)	43	MV Earthing
21	Transformer 50kVA 11/433kV (Low-loss type)	44	LV Earthing
22	Transformer 25kVA 33/433kV (Low-loss type)	45	Substation Leads
23	Transformer 25kVA 11/433kV (Low-loss type)		

5-2. JICA will assess the feasibility of the above requested items through the Survey and will report the findings to the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

5-3. Both sides confirmed that the official request was submitted by the Government of Kenya to the Government of Japan through a diplomatic channel in April 2018.

## 6. Procedures and Basic Principles of Japanese Grant

6-1. The Kenyan side agreed that the procedures and the basic principles of Japanese Grant as described in Annex 3 shall be applied to the Project. As for the monitoring of the implementation of the Project, JICA requires Kenyan side to submit the Project Monitoring Report as attached in Annex 4.

6-2. The Kenyan side agreed to take necessary measures, as described in Annex 5, for smooth implementation of the Project. The contents of the Annex 5 will be elaborated and refined during the Preparatory Survey and agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report. The contents of Annex 5 will be updated as the Preparatory Survey progresses, and eventually, will be used as an attachment to the Grant Agreement.

## 7. Schedule of the Survey

- 7-1. An official request to the Government of Japan was submitted in April 2018.
- 7-2. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Kenya in order to explain its contents around the second half of November 2018.
- 7-3. If the Kenyan side accepts the contents of the draft Preparatory Survey Report and agrees to its undertakings for the Project, JICA will finalize the Preparatory Survey Report and send it to Kenya in January 2019.
- 7-4. The above schedule is tentative and subject to change.

## 8. Environmental and Social Considerations

- 8-1. The Kenyan side confirmed to give due environmental and social considerations before and during implementation, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).
- 8-2. The Project is categorized as “B” from the following considerations:
  - The project is not located in a sensitive area, nor has sensitive characteristics, nor falls into sensitive sectors under the JICA guidelines for environmental and social considerations (April 2010), and its potential adverse impacts on the environment are not likely to be significant.
  - In case IEE is necessary, the Kenyan side confirmed to conduct the necessary procedures concerning the environmental assessment (including stakeholder meetings, Initial Environmental Examination (IEE) and information disclosure, etc.) and make IEE report of the Project. The IEE approval shall be received from the responsible authorities and submitted to JICA by Kenyan side before start of implementation.
- 8-3. In case the Project results in involuntary resettlement, the Kenyan side confirmed to prepare an Abbreviated Resettlement Action Plan (ARAP) and make it available to the public. In addition, the Kenyan side confirmed to provide the affected people with sufficient compensation and/or support in accordance with ARAP, which is consistent with JICA Guidelines for Environmental and Social Considerations (April, 2010), in a timely manner.

## 9. Other Relevant Issues

### 9-1. Tax Exemption

The team requested the Kenyan side to ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient country with respect to the purchase of the Products are exempted. The Kenyan side agreed to it.

### 9-2. Status of the Survey

The Team explained that the purpose of the Survey is to collect necessary information to evaluate the relevance, appropriateness and urgency of the Project and to analyze power distribution in the assigned counties, and also to identify the issues to be cleared for Project implementation. The Kenyan side agreed to share all necessary information

and data with the Team.

9-3. Duplication of Development Partners and agencies' activities

The Kenyan side confirmed that there is no duplication of activities among other development partners and agencies.

9-4. Counterpart Personnel

The Team requested the Kenyan side that necessary number of counterpart personnel shall be assigned to the Team and that necessary arrangements with related organizations shall be made during the Survey. The Kenyan side agreed to it.

9.5 Office Space

The Team requested the Kenyan side to arrange office space for the Team during the Survey. The Kenyan side agreed to arrange it.

9.6 Questionnaire

The Kenyan side agreed to answer to the Questionnaire submitted by the Team in English with relevant documents by 8th June.

9.7 Installation cost

JICA suggested that the Japan Grant Aid will cover procurement of equipment and materials, and Kenyan side will cover the installation cost. Kenyan side responded that they will consider the suggestion and inform JICA of their decision before JICA dispatches the second field survey in June 2018.

Annex 1 Project Sites

Annex 2 Organization Charts (MoE and Kenya Power)

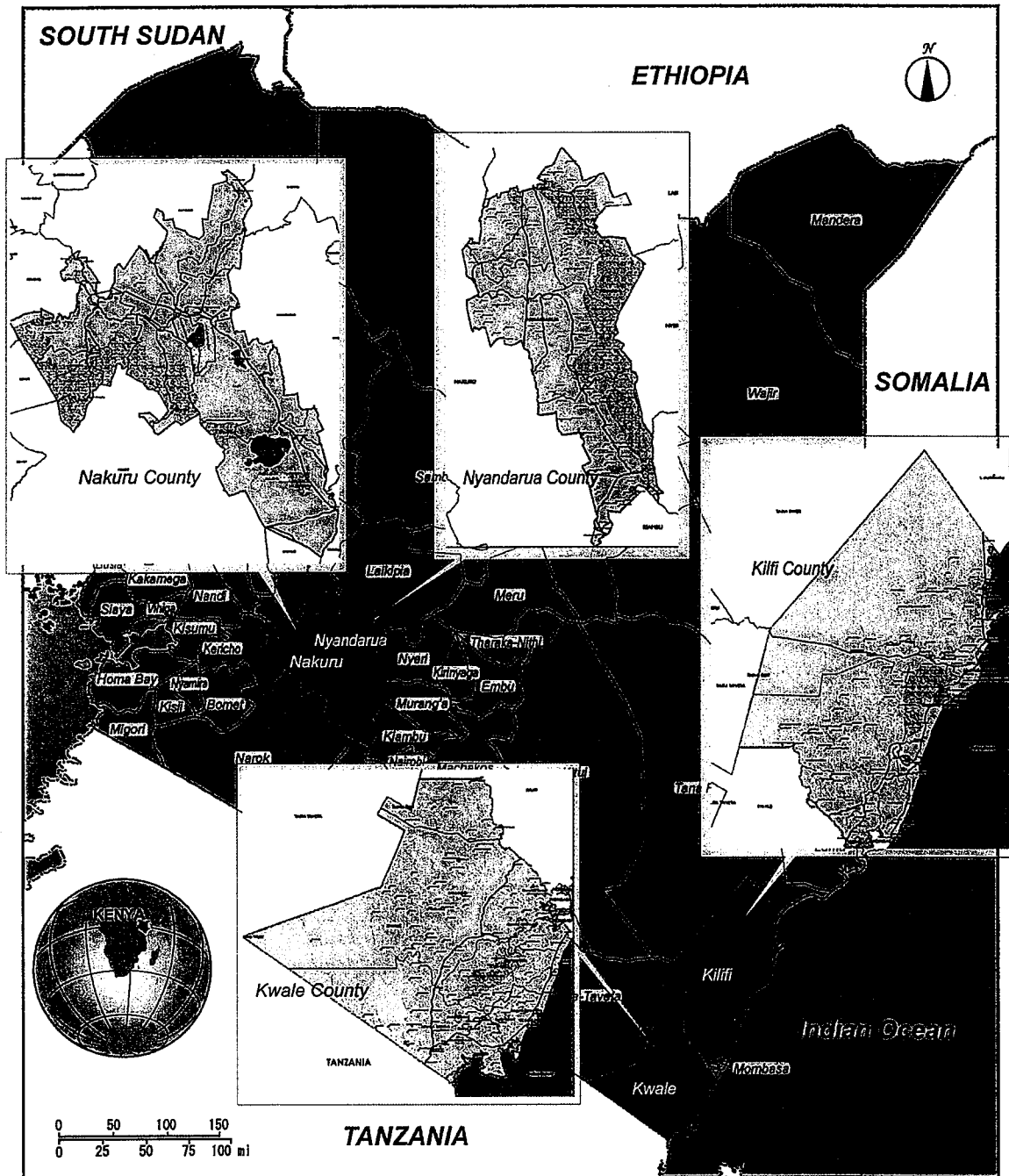
Annex 3 Japanese Grant

Annex 4 Project Monitoring Report (template)

Annex 5 Major Undertakings to be taken by the Government of Kenya (template)



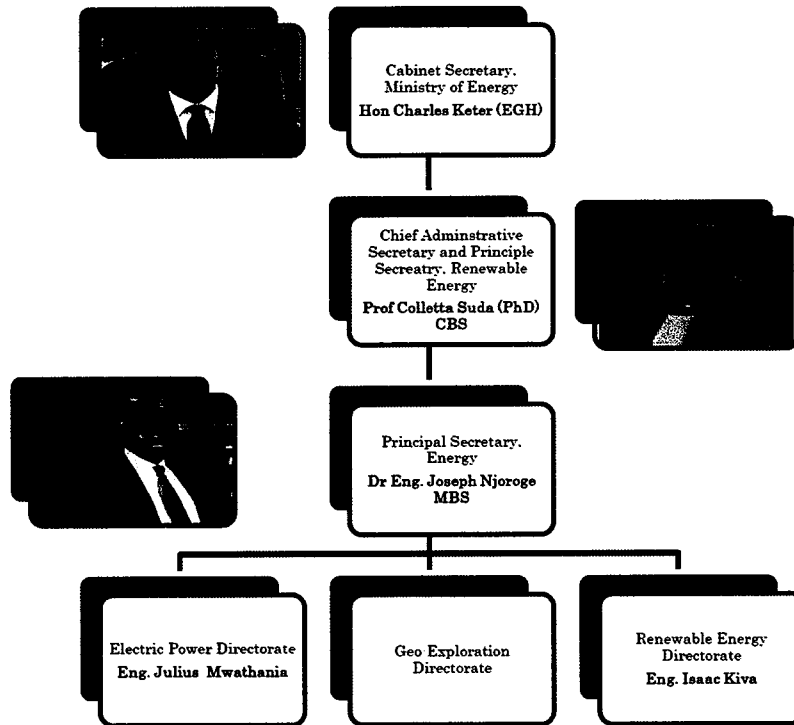
【Annex 1 Project Sites】



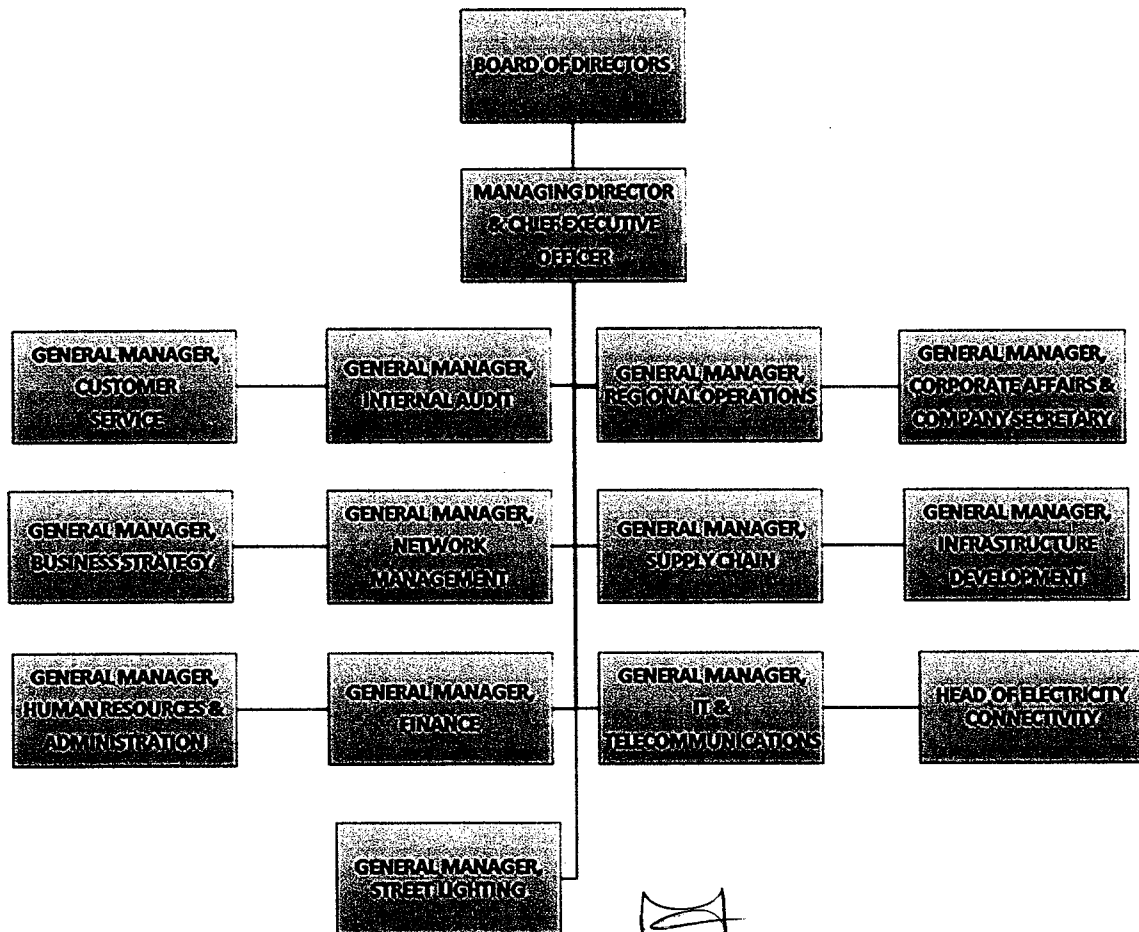
11

**【Annex 2 Organization Chart】**

**Organization Chart of Ministry of Energy**



**Organization Chart of Kenya Power**



## JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as “the Recipient”) to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as “Project Grants”).

### 1. Procedures of Project Grants

Project Grants are conducted through following procedures (See “PROCEDURES OF JAPANESE GRANT” for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as “the Survey”) conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as “GOJ”) and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as “the G/A”)

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as “the B/A”)

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as “the Bank”) to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as “the Project”) on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

### 2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project made by the

7



2



GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the Recipient necessary for the implementation of the Project.
- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

## (2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

## (3) Result of the Survey

JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

## 3. Basic Principles of Project Grants

### (1) Implementation Stage

#### 1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as “the

E/N”) will be signed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the “General Terms and Conditions for Japanese Grant (January 2016).”

2) Banking Arrangements (B/A) (See “Financial Flow of Japanese Grant (A/P Type)” for details)

- a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.
- b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA’s procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project’s implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA

about its status by using the Project Monitoring Report (PMR).

#### 8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

#### 9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

- a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.
- b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

#### (2) Ex-post Monitoring and Evaluation Stage

- 1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.
- 2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

#### (3) Others

##### 1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

##### 2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

### 3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

### 4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.



**Project Monitoring Report**  
**on**  
**Project Name**  
**Grant Agreement No. XXXXXXXX**  
 20XX, Month

**Organizational Information**

<b>Signer of the G/A (Recipient)</b>	_____ Person in Charge (Designation) _____ Contacts      Address: _____ Phone/FAX: _____ Email: _____
<b>Executing Agency</b>	_____ Person in Charge (Designation) _____ Contacts      Address: _____ Phone/FAX: _____ Email: _____
<b>Line Ministry</b>	_____ Person in Charge (Designation) _____ Contacts      Address: _____ Phone/FAX: _____ Email: _____

**General Information:**

<b>Project Title</b>	
<b>E/N</b>	Signed date: Duration:
<b>G/A</b>	Signed date: Duration:
<b>Source of Finance</b>	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____



<b>1: Project Description</b>	
-------------------------------	--

**1-1 Project Objective**

--

**1-2 Project Rationale**

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

--

**1-3 Indicators for measurement of "Effectiveness"**

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr      )	Target (Yr      )
Qualitative indicators to measure the attainment of project objectives		

<b>2: Details of the Project</b>
----------------------------------

**2-1 Location**

Components	Original <i>(proposed in the outline design)</i>	Actual
1.		

**2-2 Scope of the work**

Components	Original* <i>(proposed in the outline design)</i>	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)
-------

**2-3 Implementation Schedule**

Items	Original		Actual
	<i>(proposed in the outline design)</i>	<i>(at the time of signing the Grant Agreement)</i>	

Reasons for any changes of the schedule, and their effects on the project (if any)

--

**2-4 Obligations by the Recipient**

**2-4-1 Progress of Specific Obligations**

See Attachment 2.

**2-4-2 Activities**

See Attachment 3.

**2-4-3 Report on RD**

See Attachment 11.

**2-5 Project Cost**

**2-5-1 Cost borne by the Grant (Confidential until the Bidding)**

Components			Cost (Million Yen)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original <sup>1),2)</sup> <i>(proposed in the outline design)</i>	Actual
	1.			
Total				

Note: 1) Date of estimation:

2) Exchange rate: 1 US Dollar = Yen



**2-5-2 Cost borne by the Recipient**

Components			Cost (1,000 Taka)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original <sup>1)2)</sup> <i>(proposed in the outline design)</i>	Actual
	1.			

Note: 1) Date of estimation:  
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

**2-6 Executing Agency**

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

**Original** *(at the time of outline design)*  
name:  
role:  
financial situation:  
institutional and organizational arrangement (organogram):  
human resources (number and ability of staff):

---

**Actual** (PMR)

**2-7 Environmental and Social Impacts**

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).



### 3: Operation and Maintenance (O&M)

#### 3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original (at the time of outline design)

Actual (PMR)

#### 3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original (at the time of outline design)

Actual (PMR)

### 4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

#### Assessment of Potential Risks (at the time of outline design)

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low

	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
Actual Situation and Countermeasures (PMR)	Action required during the implementation stage:
Contingency Plan (if applicable):	

**5: Evaluation and Monitoring Plan (after the work completion)**

**5-1 Overall evaluation**

Please describe your overall evaluation on the project.

**5-2 Lessons Learnt and Recommendations**

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

### 5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

#### Attachment

1. Project Location Map
  2. Specific obligations of the Recipient which will not be funded with the Grant
  3. Monthly Report submitted by the Consultant
- Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
  - Contractor's Main Staff List
4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
  5. Environmental Monitoring Form / Social Monitoring Form
  6. Monitoring sheet on price of specified materials (Quarterly)
  7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final) only)
  8. Pictures (by JPEG style by CD-R) (PMR (final) only)
  9. Equipment List (PMR (final) only)
  10. Drawing (PMR (final) only)
  11. Report on RD (After project)



Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment Price (Decreased) E=C-D	Price (Increased) F=C+D
1 Item 1	●●t	●	●●	●●	●●	●●
2 Item 2	●●t	●	●●	●●		
3 Item 3						
4 Item 4						
5 Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

Items of Specified Materials	1st month, 2015	2nd month, 2015	3rd month, 2015	4th	5th	6th
1 Item 1	●month, 2015	●month, 2015	●month, 2015			
2 Item 2						
3 Item 3						
4 Item 4						
5 Item 5						

(3) Summary of Discussion with Contractor (if necessary)



Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)  
 (Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction	(A/D%)	(B/D%)	(C/D%)	
Cost				
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision	(A/D%)	(B/D%)	(C/D%)	
Cost				
Total	(A/D%)	(B/D%)	(C/D%)	

*[Handwritten signature]*

Major Undertakings to be taken by the Government of Kenya  
(template)

**1. Specific obligations of the Government of Kenya which will not be funded with the Grant**

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To open bank account (B/A)	within 1 month after the signing of the G/A			
2	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract			
3	To approve IEE/EIA(Conditions of approval should be fulfilled, if any) and secure the necessary budget for implementation.	within 1 month after the signing of the G/A			
4	To secure the necessary budget and implement land acquisition and resettlement (including preparation of resettlement sites), and compensation with full replacement cost in accordance with RAP	before notice of the bidding document(s)			
5	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	till land acquisition and resettlement complete			
6	To secure and clear the project sites	before notice of the bidding document(s)			
7	To obtain the planning, zoning, and building permit	before notice of the bidding document(s)			
8	To submit Project Monitoring Report (with the result of Detail Design)	before preparation of bidding document(s)			

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)



(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)			
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)			
	2) Payment commission for A/P	every payment			
3	To ensure prompt unloading and customs clearance at ports of disembarkation in the country of the Recipient and to assist the Supplier(s) with internal transportation therein	during the Project			
	To ensure prompt customs clearance and to assist the Supplier(s) with internal transportation in the country of the Recipient	during the Project			
4	To accord Japanese physical persons and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project			
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and the services are exempted	during the Project			
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project			
7	1) To submit Project Monitoring Report after each work under the contract(s) such as shipping, hand over, installation and operational training	within one month after completion of each work			
	2) To submit Project Monitoring Report (final)	within one month after signing of Certificate of Completion for the works under the contract(s)			
8	To submit a report concerning completion of the Project	within six months after completion of the Project			
9	To implement EMP and EMoP	during the construction			
10	To submit results of environmental monitoring to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	during the construction			
11	To implement RAP (livelihood restoration program, if needed)	for a period based on livelihood restoration program			



(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To implement EMP and EMoP	for a period based on EMP and EMoP			
2	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between Kenya Power and JICA.	for three years after the Project			
3	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure Routine check/Periodic inspection	After completion of the construction			

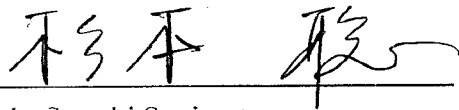




**Minutes of Discussions  
for the Preparatory Survey  
of the Project for Improvement of Power Distribution System around Nairobi City  
in the Republic of Kenya**

In response to the request from the Government of the Republic of Kenya (hereinafter referred to as "Kenya"), Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") for the Project for Improvement of Power Distribution System around Nairobi City (hereinafter referred to as "the Project") to Kenya. The Team held a series of discussions with the officials of the Government of Kenya and conducted a field survey. In the course of the discussions, both sides confirmed the main items described in the attached sheets.

10th July, 2018  
Nairobi, Kenya



Mr. Satoshi Sugimoto  
Senior Representative  
JICA Kenya Office  
Japan International Cooperation Agency  
Japan



Dr. Kenneth Tarus, PhD  
Managing Director and CEO  
Kenya Power & Lighting Co. Ltd  
Kenya

Witnessed by



Dr. Eng. Joseph Njoroge, CBS  
Principal Secretary  
Ministry of Energy  
Kenya

## ATTACHMENT

### 1. Project Objective

The Project objective is to reinforce power distribution networks by providing electrical facilities such as transformers, poles, wires and cables, thereby contributing to accelerate electrification in the Project sites.

### 2. Title of the Preparatory survey

During the 1<sup>st</sup> Field Survey conducted in April 2018, Kenyan side suggested to change the title of the Project to reflect the current project sites.

The following suggestions were advanced for the title of the Project as follows:

- Improvement of Power Distribution System around Nairobi City and Mombasa City (JICA's suggestion)
- Improvement of Power Distribution System around Urban Areas (JICA's suggestion)
- Improvement of Power Distribution System around Nakuru Town and Mombasa City (Kenyan side's suggestion)

The team explained that it will consult with the Japanese government. Both sides confirmed that the title of the Preparatory survey would be finalized before the mission for explaining the Draft Preparatory Survey Report in November.

### 3. Project sites

Both sides confirmed that the Project sites are in Nakuru County, Nyandarua County, Kilifi County and Kwale County, as shown in Annex 1. They also confirmed the location of existing transformers for Maximization and planned installation sites of new transformers for Extension and Maximization in the Project as shown in Annex 2 (map) and Annex 3 (list).

Both sides agreed that the list is tentative and will be finalized before the signing of the G/A. The Kenyan side agreed to secure the location of the Project to avoid overlap among other donors and government programs. In case the transformer locations are changed for any reason after the Team completes the field survey, Kenya Power will immediately notify JICA in a written letter explaining the reasons for the change with a proposal for a new site for installation within the same target county. Kenya Power agreed to bear all cost of additional surveys if they are needed to propose a new site.

### 4. Responsible authorities for the Project

Both sides confirmed that the authorities responsible for the Project are as follows:

- 4-1. Kenya Power will be the Executing Agency for the Project (hereinafter referred to as "the Executing Agency"). The Executing Agency shall coordinate with all the relevant

authorities to ensure smooth implementation of the Project. It shall also ensure that the undertakings for the Project are managed by relevant authorities properly and on time. The organization charts highlighting responsible persons and departments in charge are shown in Annex 4.

4-2. The line ministry of the Executing Agency is the Ministry of Energy. The Ministry of Energy shall be responsible for supervising the Executing Agency on behalf of the Government of Kenya.

5. Items requested by the Government of Kenya

5-1. Both sides confirmed that the official request was submitted by the Government of Kenya to the Government of Japan through a diplomatic channel in April 2018.

5-2. JICA is assessing the feasibility of the above requested items through the Survey and will report the findings to the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

5-3. Both sides confirmed that the list of items requested by the Government of Kenya and prospective suppliers (local, Japanese brand, third country) are as attached in Annex 5.

6. Procedures and Basic Principles of Japanese Grant

6-1. Kenyan side agreed that the procedures and the basic principles of Japanese Grant as described in Annex 6 shall be applied to the Project. As for the monitoring of the implementation of the Project, JICA requires Kenyan side to submit the Project Monitoring Report as attached in Annex 7.

6-2. Kenyan side agreed to take necessary measures, as described in Annex 8, for smooth implementation of the Project. The contents of the Annex 8 will be elaborated and refined during the Preparatory Survey and agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report. The contents of Annex 8 will be updated as the Preparatory Survey progresses, and eventually, will be used as an attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. JICA will prepare a Draft Preparatory Survey Report in English and dispatch a mission to Kenya in order to explain its contents around the second half of November 2018.

7-2. If Kenyan side accepts the contents of the Draft Preparatory Survey Report and agrees to its undertakings for the Project, JICA will finalize the Preparatory Survey Report and provide it to Kenya in February 2019.

7-3. Both sides agreed that the above schedule is tentative and subject to change.

8. Environmental and Social Considerations

8-1. Kenyan side confirmed to give due environmental and social considerations before and during implementation, and after completion of the Project, in accordance with the JICA

Guidelines for Environmental and Social Considerations (April, 2010).

8-2. The Project is categorized as “B” from the following considerations:

The project is not located in a sensitive area, nor has sensitive characteristics, nor falls into sensitive sectors under the JICA guidelines for environmental and social considerations (April 2010), and its potential adverse impacts on the environment are not likely to be significant.

Kenyan side confirmed to conduct the necessary procedures concerning the environmental assessment (including stakeholder meetings, Environmental Screening Report, and information disclosure, etc.) and seek clearance from National Environment Management Authority (NEMA). Kenyan side shall submit NEMA’s clearance letter to JICA before start of implementation.

8-3. In case the Project results in involuntary resettlement, Kenyan side confirmed to prepare an Abbreviated Resettlement Action Plan (ARAP) and make it available to the public. Kenyan side confirmed to provide the affected people with sufficient compensation and/or support in accordance with ARAP, which is consistent with JICA Guidelines for Environmental and Social Considerations (April, 2010), in a timely manner. In addition, Kenyan side confirmed to compensate for any damages to properties on wayleaves.

9. Other Relevant Issues

9-1. Tax Exemption

The Kenyan side confirmed that this project will be tax exempt from all customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient country with respect to the procurement of materials, equipment and services.

9-2. Status of the Survey

The Team explained that the purpose of the Survey is to collect necessary information to evaluate the relevance, appropriateness and urgency of the Project and to analyze power distribution in the assigned counties, and also to identify the issues to be clarified for Project implementation. Kenyan side agreed to share all necessary information and data with the Team.

9-3. Duplication of Development Partners and agencies’ activities

Kenyan side confirmed that there is no duplication of activities with the Project and the projects of other development partners and agencies.

9-4 Installation cost

During the Team’s first survey in April 2018, Kenyan side requested JICA to include installation cost in JICA’s Project budget. During the second survey, Kenya side submitted a written justification for inclusion of installation to JICA Office. JICA will consult with the Japanese government and respond to the Kenyan side during the next survey.

9-5 Budget overruns

In case there is a budget overrun for any reason before or during implementation, both

sides will discuss and mutually agree to narrow down the scope of the project. The Kenyan side proposed the following criteria for narrowing down the scope. JICA side took note of it.

- (a) Current electricity access rate
- (b) Number of existing distribution transformers per constituency
- (c) Number of transformers targeted under phase I and phase II of AfDB and the Last Mile under World Bank
- (d) Areas that comprise low income households
- (e) The targeted scheme must have at least 30 potential customers.

9-6 Major Undertakings to be taken by the Government of Kenya

The Team requested Kenyan side to undertake specific obligations which will not be funded with the Japanese Grant, as described in Annex 8. Kenyan side agreed to it.

9-7 Technical specification of the Distribution Line

The team explained that the technical specification of the distribution line is shown in Annex 9. Kenyan side agreed that the Project will follow the specification.

9-8 Storing and handling of items of the Project

Kenyan side agreed that the items of the Project will be properly stored and handled by the Kenyan side.

Annex 1 Project sites

Annex 2 Location map of new and existing transformers in the Project sites

Annex 3 Location information of new and existing transformers of the Project

Annex 4 Organization charts (MoE and Kenya Power)

Annex 5 Item list and prospective suppliers

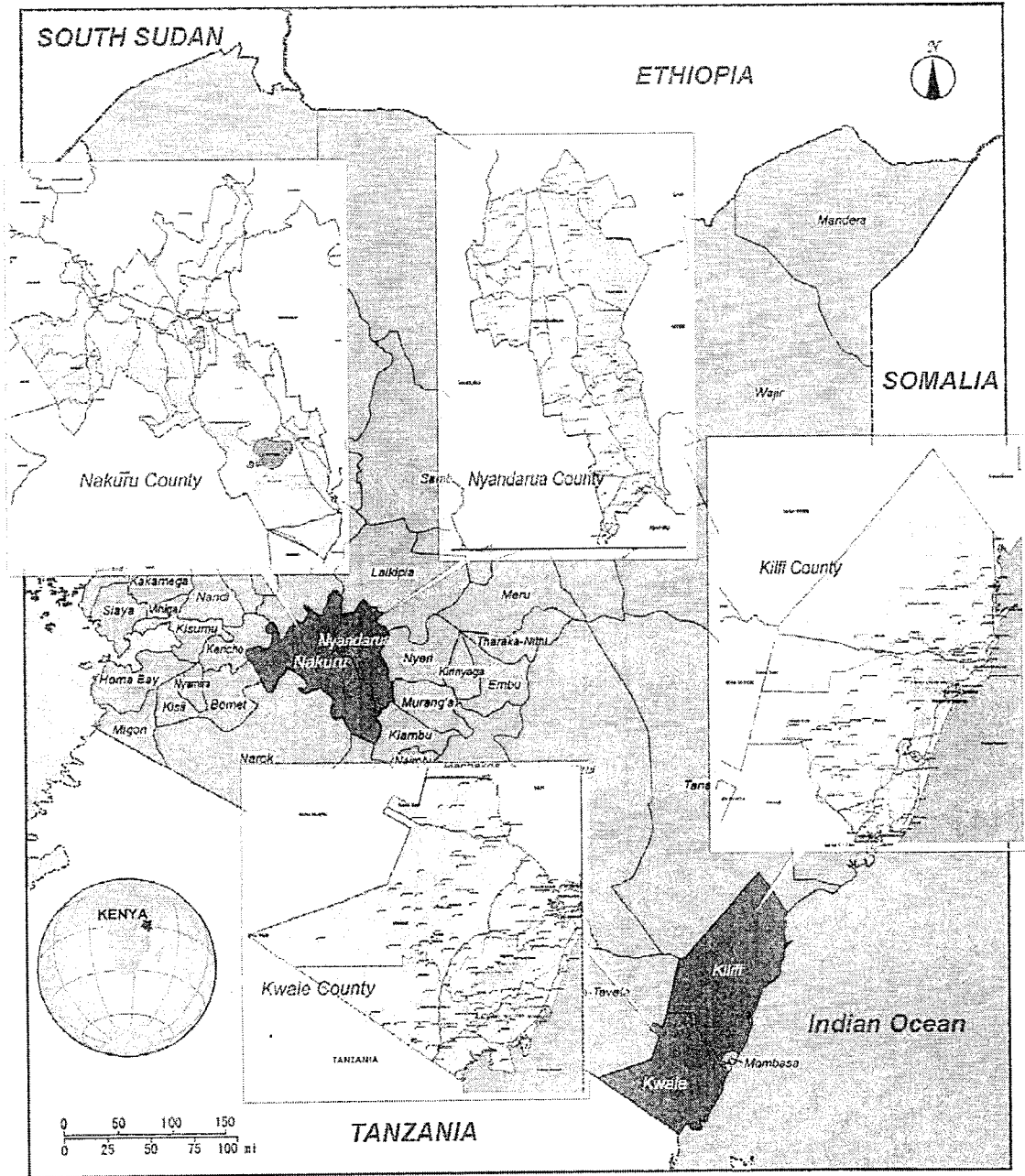
Annex 6 Explanation of Japanese Grant

Annex 7 Project Monitoring Report (template)

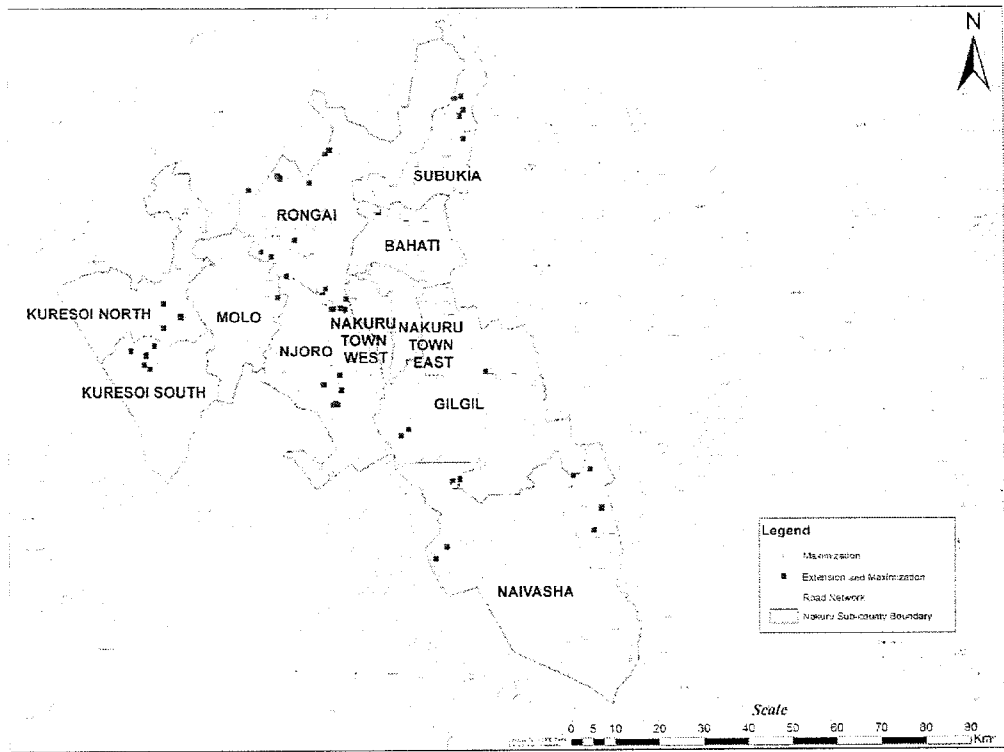
Annex 8 Major undertakings to be taken by the Government of Kenya

Annex 9 Technical specification of the distribution line

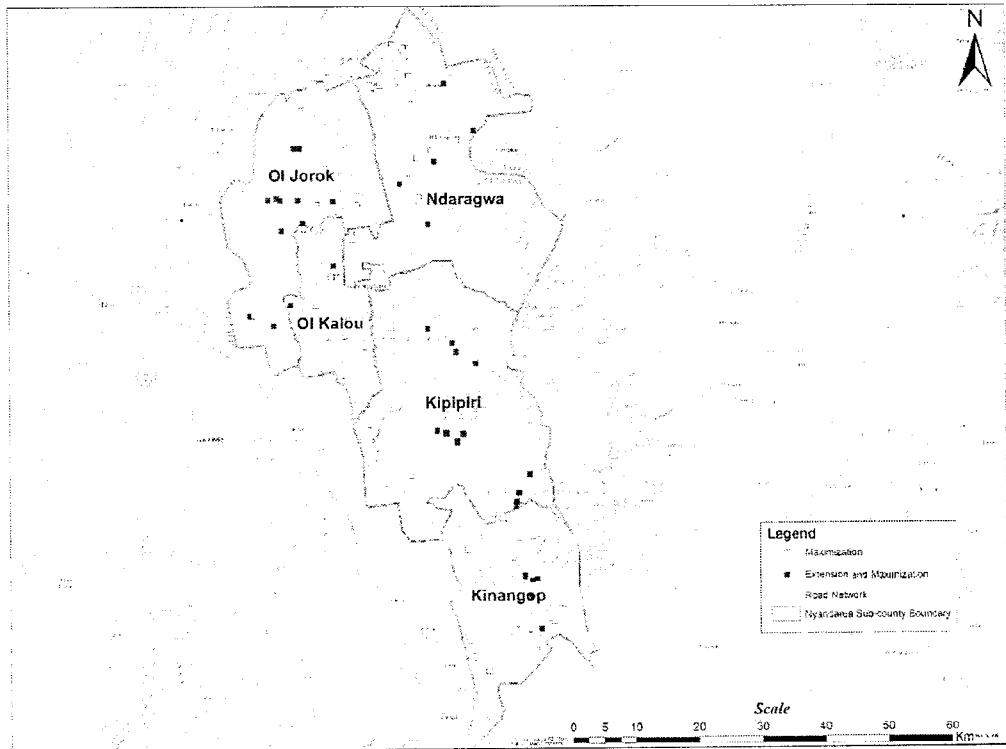
【Annex 1 Project Sites】



【Annex 2 Location map of new and existing transformers in the Project sites】



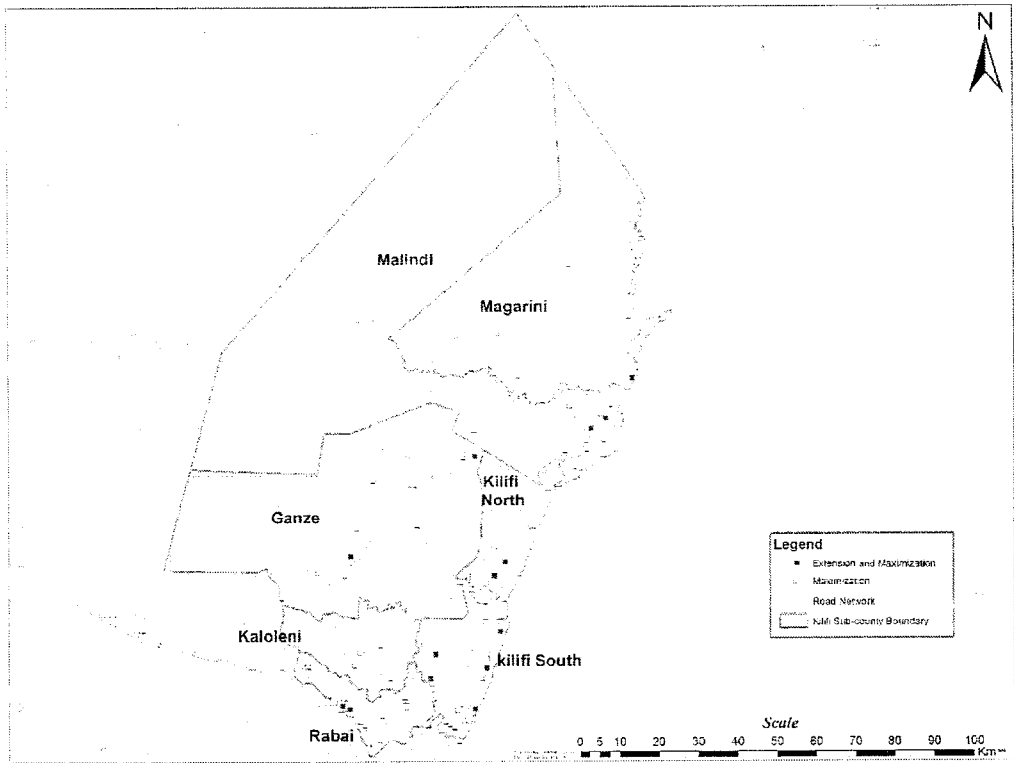
Nakuru County



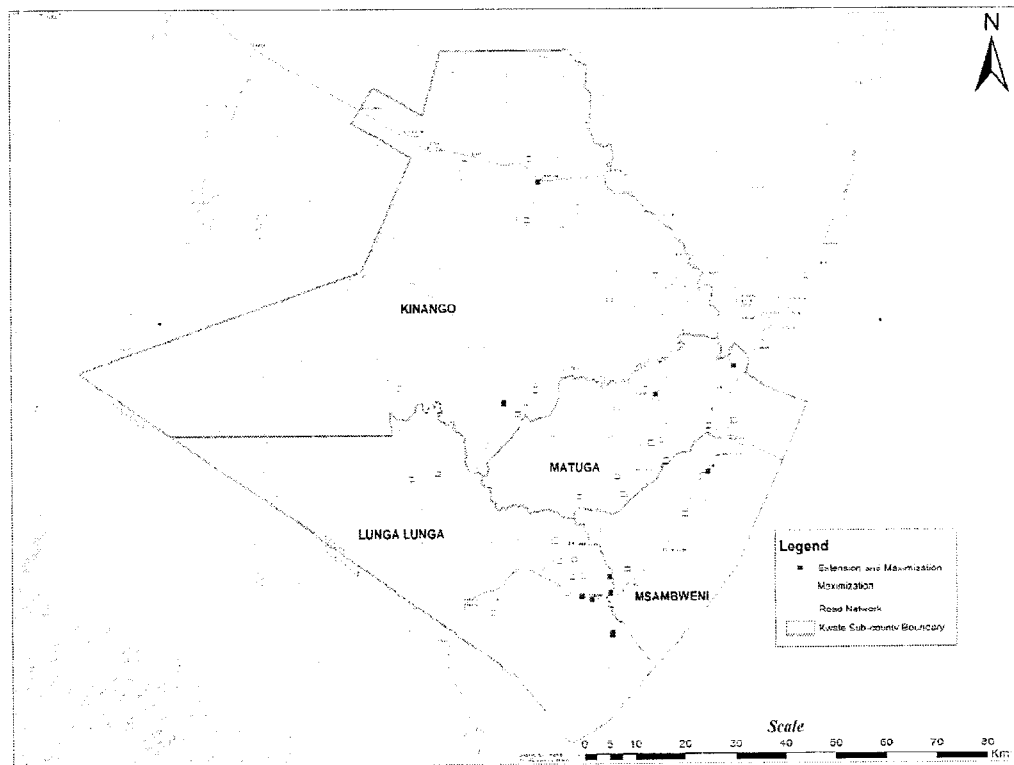
Nyandarua County

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Kilifi County



Kwale County

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【Annex 3 Location information of new and existing transformers of the Project】

The Number of Distribution Transformers of the Project

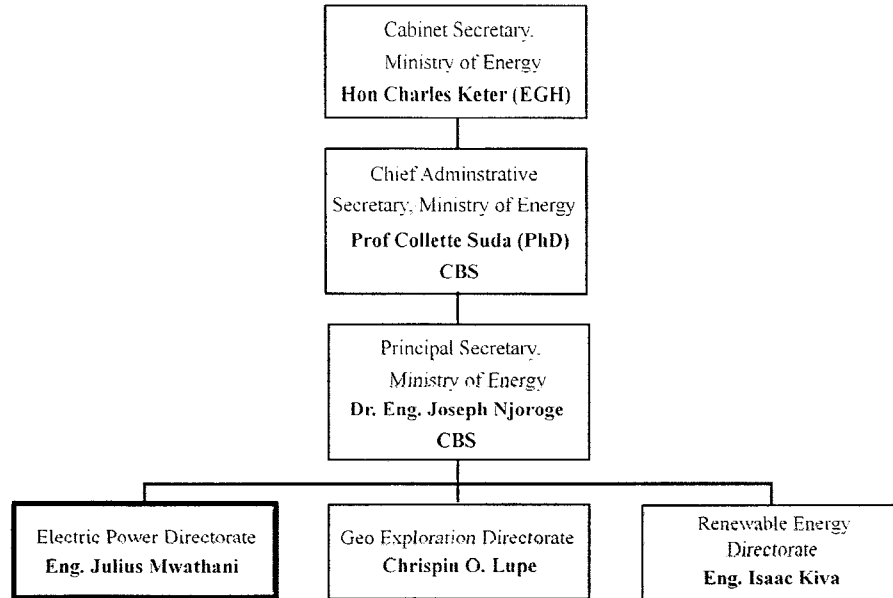
County	Number of Transformers (Maximization)	Number of Transformers (Extension and Maximization)	Total Number of Transformers
Nakuru	51	50	101
Nyandarua	55	35	90
Kilifi	127	14	141
Kwale	80	11	91
Total	313	110	423

88

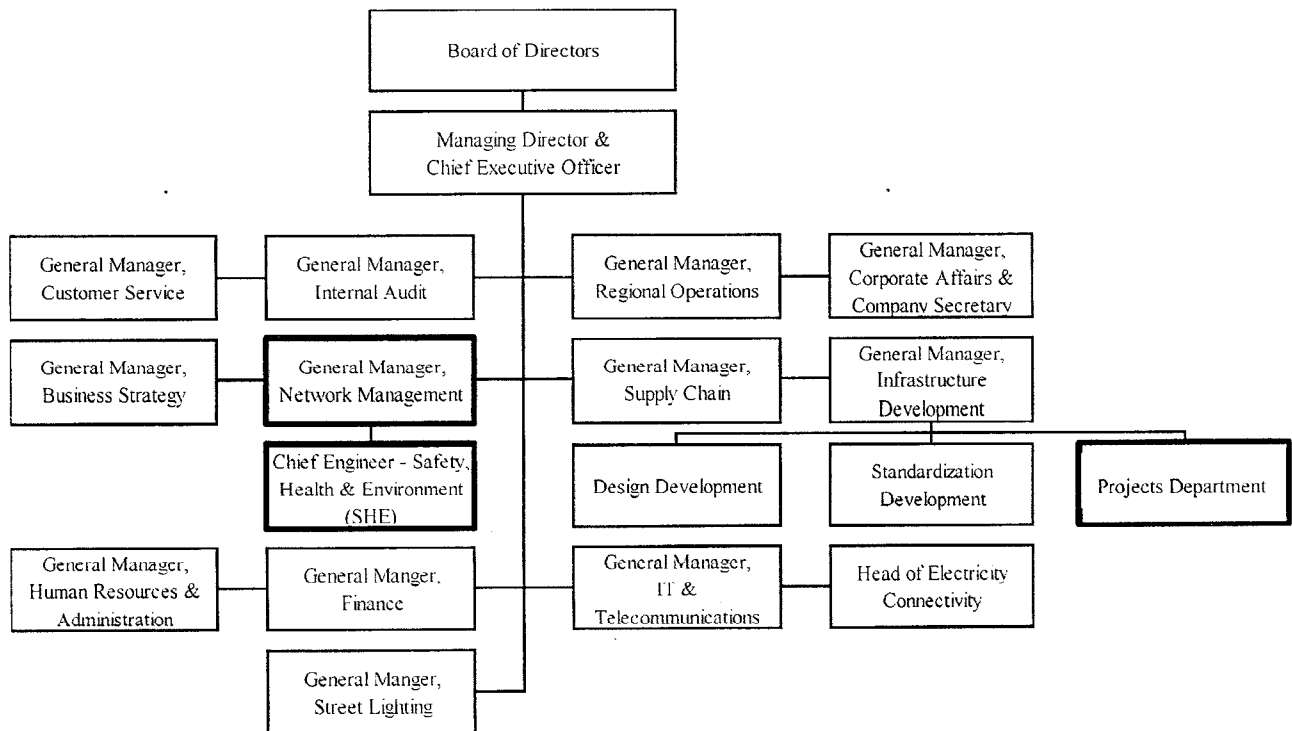
17

【Annex 4 Organization charts (MoE and Kenya Power)】

Organization Chart of Ministry of Energy



Organization Chart of Kenya Power



【Annex 5 Item list and prospective suppliers】

List of arrangement of the products

No.	Item	Supplier		
		From Local	From Japan or Japanese Brand	From Third Country
1	10mm <sup>2</sup> PVC Insulated Single Phase Concentric Aluminium Cable	✓	-	-
2	Conductor 50mm <sup>2</sup> AA hd bare	✓	-	-
3	Cutout Service IP+N 60/80A(Double)	✓	-	-
4	LV Wooden Pole Fitting	✓	-	-
5	LV Concrete Pole Fitting	✓	-	-
6	MV Wooden Pole Fittings	✓	-	-
7	MV Concrete Pole Fittings	✓	-	-
8	Service Cable Wooden fittings	✓	-	-
9	Service Cable Concrete fittings	✓	-	-
10	Pole Wood Treated 10.0m	✓	-	-
11	Pole Concrete 10.0m	✓	-	-
12	Pole Wood Treated 11.0m	✓	-	-
13	Pole Concrete 11.0m	✓	-	-
14	Pole Wood Treated 12.0m	✓	-	-
15	Pole Concrete 12.0m	✓	-	-
16	PME (Protective Multiple Earthing)	✓	-	-
17	Transformer 50kVA 33/.433kV (Low-loss type)	-	✓	-
18	Transformer 50kVA 11/.433kV (Low-loss type)	-	✓	-
19	Transformer 25kVA 33/.240kV (Low-loss type)	-	✓	-
20	Transformer 25kVA 11/.240kV (Low-loss type)	-	✓	-
21	75sqmm ACSR Conductor	✓	-	-
22	H-Pole Wooden Structures 33kV 50kva	✓	-	-
23	H-Pole Concrete Structures 33kV 50kva	✓	-	-
24	H-Pole Wooden Structures 11kV 50kva	✓	-	-
25	H-Pole Concrete Structures 11kV 50kva	✓	-	-
26	H-Pole Wooden Structures 33kV 25kva	✓	-	-
27	H-Pole Concrete Structures 33kV 25kva	✓	-	-
28	Single-Pole Wooden Structures 11kV 25kVA	✓	-	-
29	Single-Pole Concrete Structures 11kV 25kVA	✓	-	-
30	11kV Normal Stay Wooden	✓	-	-
31	11kV Normal Stay Concrete	✓	-	-
32	33kV Normal Stay Wooden	✓	-	-
33	33kV Normal Stay Concrete	✓	-	-
34	11kV Flying Stay Wooden	✓	-	-
35	11kV Flying Stay Concrete	✓	-	-
36	33kV Flying Stay Wooden	✓	-	-
37	33kV Flying Stay Concrete	✓	-	-
38	MV Earthing	✓	-	-
39	Substation Leads	✓	-	-

Note: Insulators, Fuses which are component of fittings to be procured from Japan or Third Country.

-: N/A

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## 【Annex 6 Explanation of Japanese Grant】

### JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as “the Recipient”) to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as “Project Grants”).

#### 1. Procedures of Project Grants

Project Grants are conducted through following procedures (See “PROCEDURES OF JAPANESE GRANT” for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as “the Survey”) conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as “GOJ”) and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as “the G/A”)

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as “the B/A”)

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as “the Bank”) to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as “the Project”) on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

#### 2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the Project made by the GOJ

and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the Recipient necessary for the implementation of the Project.
- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

#### (2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

#### (3) Result of the Survey

JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

### 3. Basic Principles of Project Grants

#### (1) Implementation Stage

##### 1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the

E/N”) will be signed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the “General Terms and Conditions for Japanese Grant (January 2016).”

2) Banking Arrangements (B/A) (See “Financial Flow of Japanese Grant (A/P Type)” for details)

- a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.
- b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA’s procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project’s implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to “Japanese nationals”, in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its

status by using the Project Monitoring Report (PMR).

#### 8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

#### 9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

- a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.
- b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

#### (2) Ex-post Monitoring and Evaluation Stage

- 1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.
- 2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

#### (3) Others

##### 1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

##### 2) Major undertakings to be taken by the Government of the Recipient

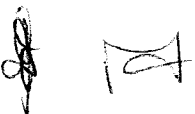
For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

### 3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

### 4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.





【Annex 7 Project Monitoring Report (template)】

<p><b><u>Project Monitoring Report</u></b>  <b>on</b>  <b><u>Project Name</u></b>  <b>Grant Agreement No. <u>XXXXXXXX</u></b>  <b>20XX, Month</b></p>
---

**Organizational Information**

<p><b>Signer of the G/A (Recipient)</b></p>	<p>_____          Person in Charge (Designation)</p> <p>Contacts      _____                              Address:                              _____ Phone/FAX:                              _____ Email:                              _____</p>
<p><b>Executing Agency</b></p>	<p>_____          Person in Charge (Designation)</p> <p>Contacts      _____                              Address:                              _____ Phone/FAX:                              _____ Email:                              _____</p>
<p><b>Line Ministry</b></p>	<p>_____          Person in Charge (Designation)</p> <p>Contacts      _____                              Address:                              _____ Phone/FAX:                              _____ Email:                              _____</p>

**General Information:**

<p><b>Project Title</b></p>	<p>_____</p>
<p><b>E/N</b></p>	<p>Signed date:          Duration:</p>
<p><b>G/A</b></p>	<p>Signed date:          Duration:</p>
<p><b>Source of Finance</b></p>	<p>Government of Japan: Not exceeding JPY _____ mil.          Government of (_____): _____</p>



<b>1: Project Description</b>	
-------------------------------	--

**1-1 Project Objective**

**1-2 Project Rationale**

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

**1-3 Indicators for measurement of "Effectiveness"**

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr      )	Target (Yr      )
Qualitative indicators to measure the attainment of project objectives		

**2: Details of the Project**

**2-1 Location**

Components	Original <i>(proposed in the outline design)</i>	Actual
1.		

**2-2 Scope of the work**

Components	Original* <i>(proposed in the outline design)</i>	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

**2-3 Implementation Schedule**

Items	Original		Actual
	<i>(proposed in the outline design)</i>	<i>(at the time of signing the Grant Agreement)</i>	

Reasons for any changes of the schedule, and their effects on the project (if any)

--

**2-4 Obligations by the Recipient**

**2-4-1 Progress of Specific Obligations**

See Attachment 2.

**2-4-2 Activities**

See Attachment 3.

**2-4-3 Report on RD**

See Attachment 11.

**2-5 Project Cost**

**2-5-1 Cost borne by the Grant(Confidential until the Bidding)**

Components			Cost (Million Yen)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original <sup>1),2)</sup> <i>(proposed in the outline design)</i>	Actual
	1.			
Total				

Note: 1) Date of estimation:  
2) Exchange rate: 1 US Dollar = Yen

**2-5-2 Cost borne by the Recipient**

Components			Cost (1,000 Taka)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original <sup>1),2)</sup> <i>(proposed in the outline design)</i>	Actual
	1.			

Note: 1) Date of estimation:  
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

**2-6 Executing Agency**

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

**Original** *(at the time of outline design)*  
name:  
role:  
financial situation:  
institutional and organizational arrangement (organogram):  
human resources (number and ability of staff):

---

**Actual** *(PMR)*

**2-7 Environmental and Social Impacts**

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

**3: Operation and Maintenance (O&M)**

**3-1 Physical Arrangement**

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original <i>(at the time of outline design)</i>
Actual <i>(PMR)</i>

**3-2 Budgetary Arrangement**

- Required O&M cost and actual budget allocation for O&M

Original <i>(at the time of outline design)</i>
Actual <i>(PMR)</i>

**4: Potential Risks and Mitigation Measures**

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

**Assessment of Potential Risks *(at the time of outline design)***

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:

	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
<b>Actual Situation and Countermeasures</b>	
(PMR)	

**5: Evaluation and Monitoring Plan (after the work completion)**

**5-1 Overall evaluation**

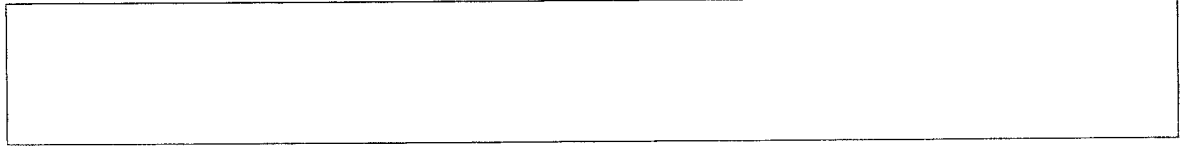
Please describe your overall evaluation on the project.

**5-2 Lessons Learnt and Recommendations**

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

**5-3 Monitoring Plan of the Indicators for Post-Evaluation**

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.



#### Attachment

1. Project Location Map
  2. Specific obligations of the Recipient which will not be funded with the Grant
  3. Monthly Report submitted by the Consultant
- Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
  - Contractor's Main Staff List
4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
  5. Environmental Monitoring Form / Social Monitoring Form
  6. Monitoring sheet on price of specified materials (Quarterly)
  7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final) only)
  8. Pictures (by JPEG style by CD-R) (PMR (final) only)
  9. Equipment List (PMR (final) only)
  10. Drawing (PMR (final) only)
  11. Report on RD (After project)

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
					Price (Decreased) E=C-D	Price (Increased) F=C+D
1 Item 1	●●t	●	●	●	●	●
2 Item 2	●●t	●	●	●		
3 Item 3						
4 Item 4						
5 Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

Items of Specified Materials	1st month, 2015	2nd month, 2015	3rd month, 2015	4th	5th	6th
1 Item 1	●	●	●			
2 Item 2						
3 Item 3						
4 Item 4						
5 Item 5						

(3) Summary of Discussion with Contractor (if necessary)



Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)  
 (Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

【Annex 8 Major undertakings to be taken by the Government of Kenya】

1. Specific obligations of the Government of Kenya which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To implement stakeholder meeting	Before the G/A	SHE Department (KPLC)	xx USD	
2	To open Bank Account (B/A)	within 1 month after the signing of the G/A	National Treasury		
3	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract	National Treasury		
4	To approve IEE/EIA (Conditions of approval should be fulfilled, if any) and secure the necessary budget for implementation.	within 1 month after the signing of the G/A	SHE Department (KPLC)	xx USD	
5	To secure the necessary budget for compensation for Land , Structures,Crops, Trees	before notice of the bidding document(s)	EP Directorate (MoE)		
6	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	till land compensation and resettlement complete	Projects Department (KPLC)		
7	To secure and clear the project sites	before notice of the bidding document(s)	Projects Department (KPLC)		
8	To obtain the planning, zoning, and building permit	before notice of the bidding document(s)	Projects Department (KPLC)		
9	To submit Project Monitoring Report (with the result of Detail Design)	before preparation of bidding document(s)	Projects Department (KPLC)		

Note: B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable, SHE : Safety ,Health & Environment. EP: Electric Power

xx shall be fixed in Draft Preparatory Survey Report.

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)	Projects Department (KPLC)		
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A		Projects Department (KPLC)		
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	Projects Department (KPLC)		
	2) Payment commission for A/P	every payment	Projects Department (KPLC)		
3	To ensure prompt unloading and customs clearance at ports of disembarkation in the country of the Recipient and to assist the Supplier(s) with internal transportation therein	during the Project	Projects Department (KPLC)		
	To ensure prompt customs clearance and to assist the Supplier(s) with internal transportation in the country of the Recipient	during the Project	Projects Department (KPLC)		
4	To accord Japanese physical persons and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project	Projects Department (KPLC)		
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and the services are exempted	during the Project	Projects Department (KPLC)		
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	Projects Department (KPLC)		
7	1) To submit Project Monitoring Report after each work under the contract(s) such as shipping, hand over, installation and operational training	within one month after completion of each work	Projects Department (KPLC)		
	2) To submit Project Monitoring Report (final)	within one month after signing of Certificate of Completion for the works under the contract(s)	Projects Department (KPLC)		
8	To submit a report concerning completion of the Project	within six months after completion of the Project	Projects Department (KPLC)		
9	To implement EMP and EMoP	during the construction	Projects Department (KPLC)		
10	To submit results of environmental monitoring to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	during the construction	Projects Department (KPLC)		

11	To implement RAP (livelihood restoration program, if needed)	for a period based on livelihood restoration program	Projects Department (KPLC)		
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(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To implement EMP and EMoP	for a period based on EMP and EMoP	SHE Department (KPLC)		
2	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between Kenya Power and JICA.	for three years after the Project	SHE Department (KPLC)		
3	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure Routine check/Periodic inspection	After completion of the construction	NWM Department (KPLC)		

Note NWM: Network Management

【Annex 9 Technical specification of the distribution line】

Technical Specification of the Distribution Line

1. Distribution Transformers

The outdoor-type distribution transformers integrated with lightning arresters are to be installed. These shall conform to IEC 60076. Other requirements on individual transformers are as follows.

Technical Particulars of Distribution Line Transformers

Description	Requirements	
Rated Output (kVA)	50	25
Type	Outdoor, oil-immersed self cooling type	
Primary/Secondary Voltage	11, 33kV / 0.433kV	11, 33kV / 0.240kV
Connection	Δ-Y, 3-phase, 3-wire / 3-phase, 4-wire	Δ-V, Single-phase

2. Conductors

Aluminum Conductor Steel Reinforce (ACSR) shall be used for medium voltage (MV) while All Aluminum Hard Drawn Bare Conductor (AA HD BARE) for low voltage lines (LV) and Aerial Bundled Cables (ABC) for Service Wire.

Technical Particulars of ACSR (MV)

Description	Requirements
Rated Voltage(kV)	11, 33
Construction	Aluminum Conductor Steel Reinforced
Sectional Area (mm <sup>2</sup> )	75

Technical Particulars of AA HD BARE (LV)

Description	Requirements
Rated Voltage(kV)	0.6/1.0
Construction	All Aluminum Hard Drawn Bare Conductor
Sectional Area (mm <sup>2</sup> )	50

Technical Particulars of Concentric Cable (Service Wire)

Description	Requirements
Rated Voltage (kV)	0.6/1.0
Insulating Materials	XLPE
Sectional Area (mm <sup>2</sup> )	10
Inscription for cores	phases :1 neutral: Wire armour

3. Insulators

Pin and disk insulators are to be used for supporting the MV line conductors.

4. Fuse cutout switches

Fuse cutout switch with cartridge fuses for the transformer protection shall be used.

5. Lightning arresters

The individual item of lightning arrester will not be used, because transformer integrated with lightning arresters shall be used.

6. Ground wires

The overhead ground wire will not be used.

7. Overhead line support

Supports for overhead lines are to be of steel reinforced concrete and/or chemically treated wooden pole, with 11 and/or 12 m long for MV distribution lines, and 10 m for LV lines.

The material and height of poles is decided as follows:

Material of Pole

Description	Type of Material
33kV Lines	Steel reinforced concrete
11kV Lines	Steel reinforced concrete
LV Lines	Wooden*

\*In case the lines are three (3) phase, the steel reinforced concrete pole is considered

Height of Pole

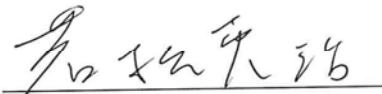
	33kV line (m, ft)	11kV Line (m, ft)	LV Line (m, ft)
Span	80m	80m	50m
Distance from lower cross arm to the top of pole	0	0	-
Maximum sag of conductor	1m	1.2m	1.4m
Minimum height of conductor above ground	9m	8m	7m
Clearance (phase to phase)	3ft	2,5ft	1ft
Depth of pole	2m	1.8m	1.6m
Total (necessary pole height)	12m	11m	10m

**Minutes of Discussions**  
**on the Preparatory Survey for the Project for**  
**Improvement of Power Distribution System**  
**around Nakuru and Mombasa Cities**  
**in the Republic of Kenya**  
**(Explanation on Draft Preparatory Survey Report)**

With reference to the Minutes of Discussions signed between Kenya Power & Lighting Co. Ltd (hereinafter referred to as "Kenya Power") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 10th July, 2018 and in response to the request from the Government of the Republic of Kenya (hereinafter referred to as "Kenya") dated 23<sup>rd</sup> March 2018, JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the JICA Team") for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Improvement of Power Distribution System around Nakuru and Mombasa Cities in the Republic of Kenya (hereinafter referred to as "the Project").

As a result of the discussions, both sides agreed on the main items described in the attachment.

5th December, 2018  
Nairobi, Kenya



Mr. Eiji Wakamatsu  
Team Leader  
Preparatory Survey Team  
Japan International Cooperation Agency  
Japan



Eng. Jared Othieno  
Ag. Managing Director and CEO  
Kenya Power & Lighting Co. Ltd  
Kenya

Witnessed by



Dr. Eng. Joseph Njoroge, CBS  
Principal Secretary  
Ministry of Energy  
Kenya

## ATTACHMENT

### 1. Objective of the Project

The objective of the Project is to reinforce power distribution networks by providing electrical facilities such as transformers, poles, wires and cables, thereby contributing to accelerate electrification in the Project sites.

### 2. Title of the Project

During the 1st Field Survey conducted in April 2018, the Kenyan side suggested the JICA Team to change the title of the Project to reflect the current project sites. Both sides agreed to change the project title as follows:

(Original) The Project for Improvement of Power Distribution System around Nairobi City

(New) The Project for Improvement of Power Distribution System around Nakuru and Mombasa Cities

### 3. Project site

Both sides confirmed that the Project sites are in Nakuru County, Nyandarua County, Kilifi County and Kwale County, which are shown in Annex 1. The JICA Study Team undertook on-site surveys in the target sites stipulated in the Official Request.

The team found that some of the targeted transformers were duplicated with other existing ones, already finished with connections, did not exist in the GIS database, or were located outside of the target county. Due to this issue, the number of transformers that could be targeted were reduced from a total of 423 to 403. Both sides confirmed the locations for the Project as shown in Annex 2 (map) and Annex 3 (list).

The Kenyan side assured the JICA Study Team that it will do everything in its mandate to secure the locations that were surveyed by JICA. Both sides agreed that should there be any changes to the locations for any reasons, the Kenyan side will immediately notify JICA in writing and KPLC will provide at its own cost, another site as a replacement, which has almost the same number of consumers as the original site within the four target counties.

### 4. Responsible authority for the Project

Both sides confirmed that the authorities responsible for the Project are as follows:

- 4-1. Kenya Power & Lighting Co. Ltd will be the executing agency for the Project (hereinafter referred to as “the Executing Agency” or “Kenya Power”). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project and ensure that Project undertakings are executed effectively and in timely manner. The organization charts are shown in Annex 4.



*me*      *[Signature]*      *[Signature]*

4-2. The line ministry of the Executing Agency is Ministry of Energy. Ministry of Energy shall be responsible for supervising the Executing Agency on behalf of the Government of Kenya.

5. Items requested by the Government of Kenya

5-1. Both sides confirmed that the official request was submitted by the Government of Kenya to the Government of Japan through the diplomatic channel in April 2018.

5-2. The JICA Team explained that materials and equipment for connection such as cutout service and service cable (hereinafter referred to as “the Items”) shall be excluded from the scope of the Project since costs of these Items will be included in the end-users' electricity bills after connection. Both sides agreed to remove the Items from the Item list agreed in the Annex 5 of the Minutes of Discussion signed on 10th July 2018. A revised Item list is shown in Annex 5; whereby the italic and bold show modifications.

6. Wayleaves Compensation

Kenya Power explained that because the Project is part of a national program classified under Last Mile Connectivity Project (hereinafter referred as “LMCP”) and similar to projects under the Rural Electrification Agency (REA) schemes, wayleave compensation is not expected. The reason is that the government program aims to bring down the connection cost of end-users by providing necessary infrastructure and any wayleaves damage is regarded as contribution from the end-users. However, any crops and/or trees that would be cut or damaged belong to the owner.

Both sides agreed that as a basic principle of JICA’s Guidelines for Environmental and Social Considerations policy, the KPLC should explain LMCP’s compensation policy to the Project Affected Persons (PAPs) and obtain their consent in advance.

7. Security Arrangements

The JICA team explained that given the security situation in the coastal areas, the Japanese personnel should not be allowed to operate in Kwale and Kilifi without police escort. The Kenyan side agreed to take full responsibility to ensure that adequate security arrangements are in place for both Japanese and Kenyan personnel working in all the Project sites, especially in Kwale and Kilifi counties including security escorts to and from these sites during the Project period.

The JICA Team further explained that in case the security situation deteriorates further, preventing Japanese personnel to travel to the project area even with police escort, JICA will propose necessary plans with the aim to continue with the project.

8. Contents of the Draft Final Report

Both sides discussed the contents of the Draft Final Report. The Kenyan side agreed to

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provide comments on the contents no later than 14<sup>th</sup> Dec, 2018.

9. Cost estimate

Both sides confirmed that the cost estimation including contingency cost explained by the JICA Team is provisional and subject to further authorization by the Government of Japan. The contingency would cover the additional cost against natural disaster, unexpected natural conditions, etc.

10. Confidentiality of the cost estimation and technical specifications

Both sides agreed that the cost estimation and technical specifications of the Project should not be disclosed to any third parties until all the contracts under the Project are concluded.

11. Procedures and Basic Principles of Japanese Grant

Kenyan side agreed that the procedures and basic principles of Japanese Grant as described in Annex 6 shall be applied to the Project. In addition, Kenyan side agreed to take necessary measures according to the procedures.

12. Timeline for the project implementation

The JICA Team explained to Kenyan side that the expected timeline for the project implementation is as attached in Annex 7.

13. Expected outcomes and indicators

Both sides agreed that key indicators for expected outcomes are as follows:

[Quantitative indicators]

The number of households who are able to access electricity in targeted area: 14,671 households

[Qualitative indicators]

Improvement of customers' life and environment

Kenyan side will be responsible for the achievement of agreed key indicators to be achieved in year 2023 and shall monitor the progress based on those indicators and report to JICA semi-annually.

14. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 8. Both sides also confirmed that Annex 8 will be used as an attachment of Grant Agreement (hereinafter referred to as "G/A"). Some issues that need to be highlighted are as follows.

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14-1. Tax exemption: Both sides agreed that the Kenyan side will provide quick and timely customs clearance and tax exemption for procured equipment/materials, as well as exemption from value-added tax, income tax, corporate tax, local taxes, or related taxes imposed on services provided by the Japanese people or any corporate body engaged under the project. Both sides also confirmed that such customs duties, internal taxes and other fiscal levies shall be clarified in the bid documents by the Executing Agency during the implementation stage of the Project.

14-2. Budget allocation: Kenyan side assured JICA that it will take necessary measures including allocation of the necessary budget as preconditions for implementation of the Project.

14-3. Proper handling of equipment and materials

14-4. Appointment of personnel for the Project: Both sides agreed that counterpart personnel for the Project will be appointed immediately after signing of G/A

#### 15. Monitoring during implementation

The Project will be monitored by the Executing Agency and reported to JICA using the Project Monitoring Report (hereinafter referred to as "PMR") form attached as Annex 9. The timing of submission of the PMR is described in Annex 8.

#### 16. Project completion

Both sides confirmed that the project will be completed when all the facilities constructed and equipment procured by the grant are in operation. The completion of the Project will be reported to JICA promptly, but in any event not later than six months after completion of the construction.

As stated in section 13, both sides agreed that KPLC will report to JICA periodically semi-annually on the key indicators for 3 years after its completion to ensure that it contributed to electricity access of target communities.

#### 17. Ex-Post Evaluation

JICA will conduct ex-post evaluation three (3) years after the project completion, in principle, with respect to five OECD DAC (Organization for Economic Cooperation and Development, Development Assistance Committee) evaluation criteria: relevance, effectiveness, efficiency, impact and sustainability. The result of the evaluation including lessons learned and recommendations will be fed back to JICA as well as the Kenyan side including KPLC to help improve JICA projects as well as to ensure accountability and transparency. They will also be publicized on JICA's website. Kenyan side will be required to provide necessary support for data collection.

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## 18. Schedule of the Study

JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to Kenyan side around March 2019.

## 19. Environmental and Social Considerations

### 19-1 General Issues

#### 19-1-1 Environmental Guidelines and Environmental Category

The JICA Team explained that ‘JICA Guidelines for Environmental and Social Considerations (April 2010)’ (hereinafter referred to as “the Guidelines”) is applicable for the Project. The Project is categorized as B because the project is not located in a sensitive area, nor has sensitive characteristics, nor falls into sensitive sectors under the guidelines, and its potential adverse impacts on the environment are not likely to be significant.

Kenyan side confirmed that it will conduct necessary procedures concerning the environmental assessment (including stakeholder meetings, Environmental Screening Report, and information disclosure, etc.) and seek clearance from National Environment Management Authority (hereinafter referred to as “NEMA”). Kenyan side shall submit NEMA’s clearance letter to JICA before start of implementation.

#### 19-1-2 Environmental Checklist

The environmental and social considerations including major impacts and mitigation measures for the Project are summarized in the Environmental Checklist attached as Annex 10. Both sides confirmed that in case of major modification of the content of the Environmental Checklist, Kenyan side shall submit the modified version to JICA in a timely manner.

### 19-2 Environmental Issues

#### 19-2-1 Environmental Management Plan and Environmental Monitoring Plan

Both sides confirmed Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP) of the Project is as Annex 11, respectively. Both side agreed that environmental mitigation measures and monitoring shall be conducted based on the EMP and EMoP, which may be updated during the detailed design stage.

### 19-3 Environmental and Social Monitoring

#### 19-3-1 Environmental Monitoring

Both sides agreed that Kenyan side will submit results of environmental and social monitoring to JICA with Project Monitoring Report using the monitoring form attached as Annex 12. The timing of submission of the monitoring form is described in item No.7 of Annex 8.

#### 19-3-2 Information Disclosure of Monitoring Results

Both sides confirmed that Kenyan side will disclose the results of environmental

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and social monitoring to local stakeholders through their website.

Kenyan side agreed JICA will disclose results of environmental and social monitoring submitted by Kenyan side as per the monitoring forms attached as Annex 12 on its website.

Annex 1 Project sites

Annex 2 Location map of new and existing transformers in the Project sites

Annex 3 Location information of new and existing transformers of the Project

Annex 4 Organization charts (MoE and Kenya Power)

Annex 5 Item list and prospective suppliers

Annex 6 Explanation of Japanese Grant

Annex 7 Project Implementation Schedule

Annex 8 Major undertakings to be taken by the Government of Kenya

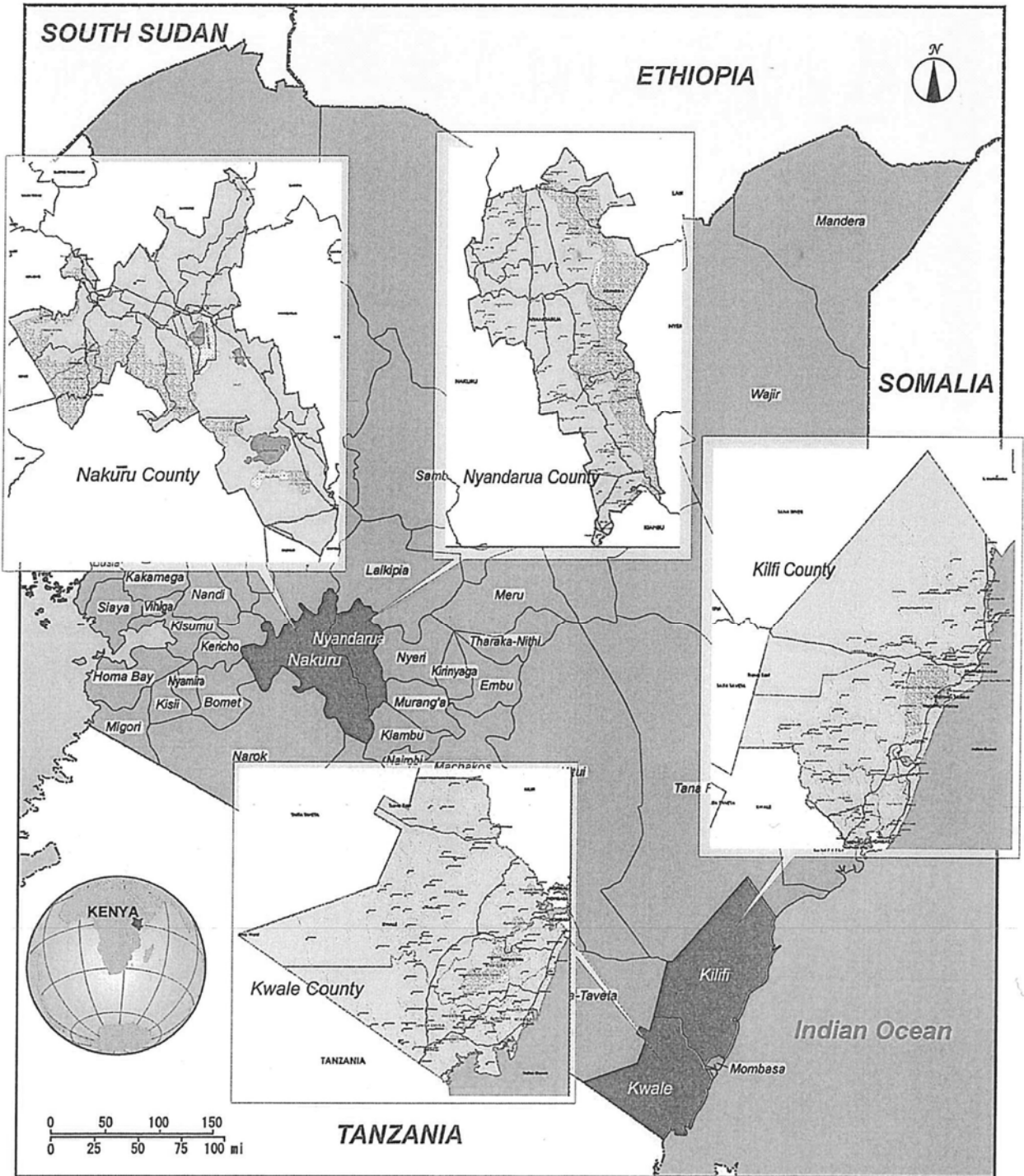
Annex 9 Project Monitoring Report (template)

Annex 10 Environmental Check List

Annex 11 Environmental Monitoring Plan

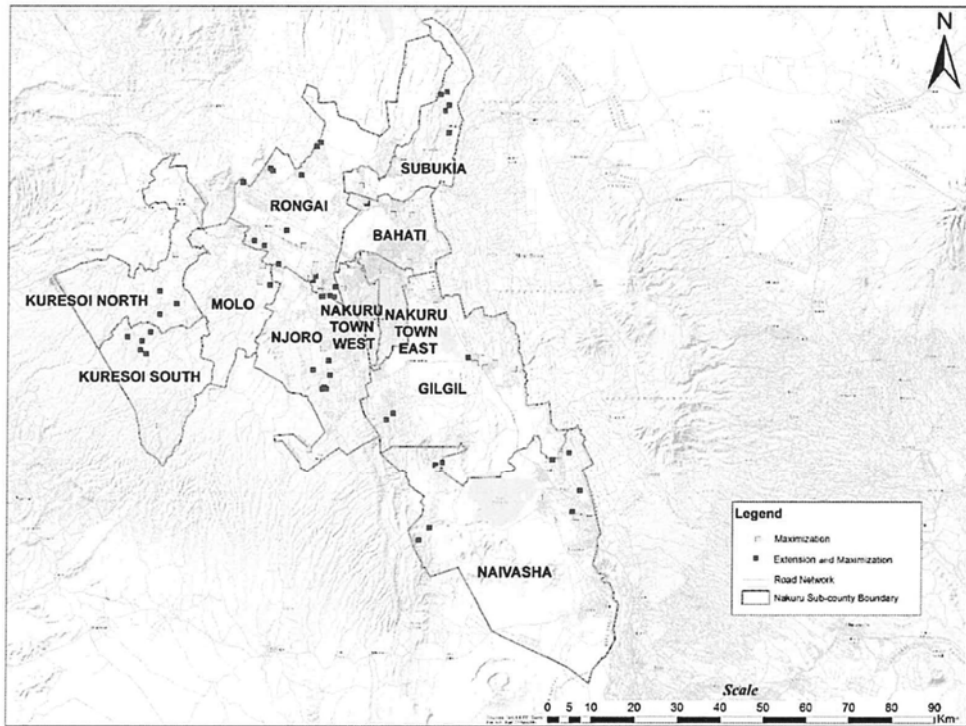
Annex 12 Environmental and Social Monitoring Form

【Annex 1 Project Sites】

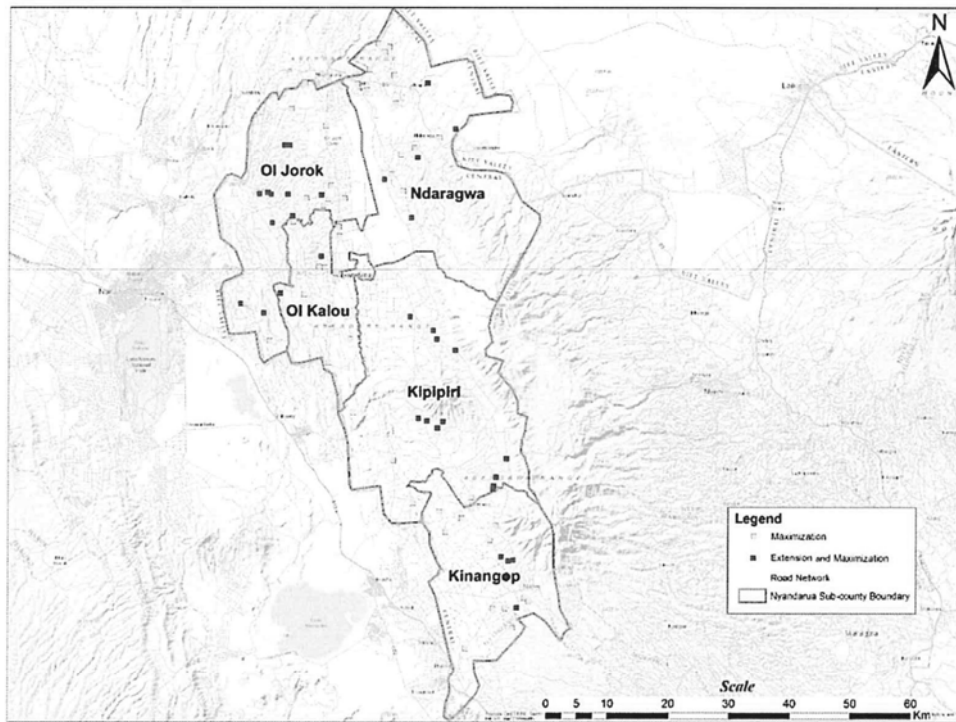


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[Annex 2 Location map of new and existing transformers in the Project sites]

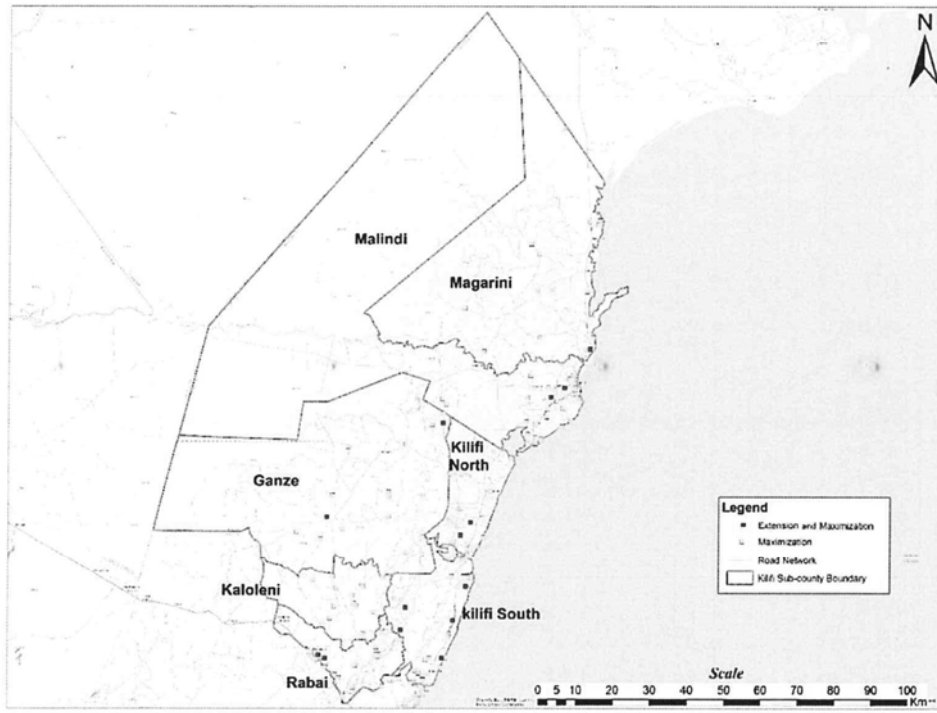


Nakuru County

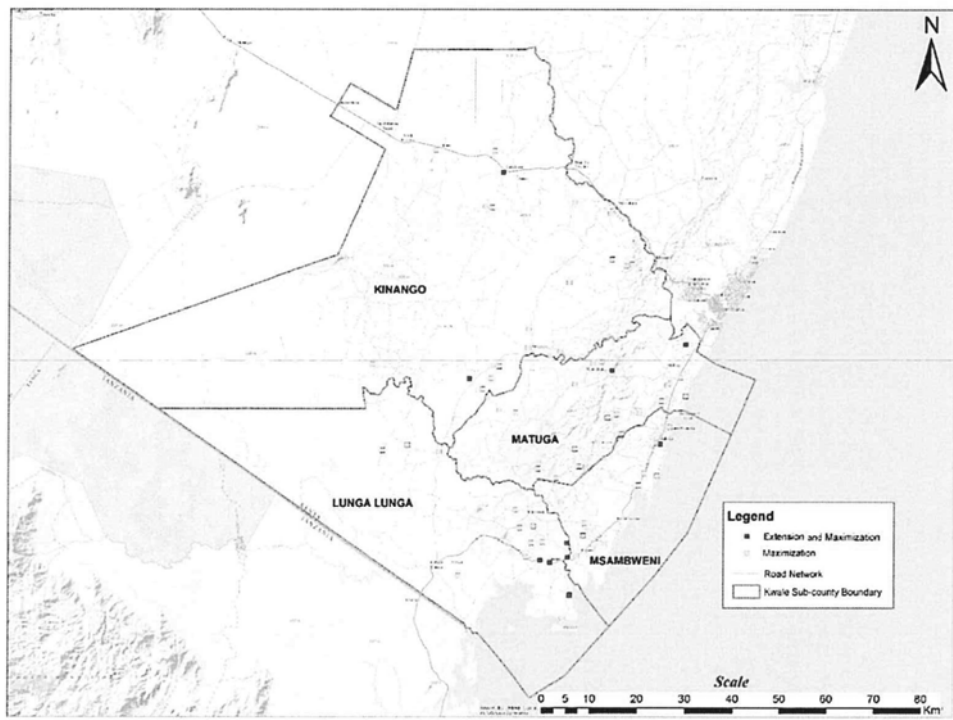


Nyandarua County

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




Kilifi County



Kwale County



【Annex 3 Location information of new and existing transformers of the Project】

Table 1. Number of transformers we agreed on the 2<sup>nd</sup> survey (July 10<sup>th</sup>)

County	Number of Transformers (Maximization)	Number of Transformers (Extension and Maximization)	Total Number of Transformers
Nakuru	51	50	101
Nyandarua	55	35	90
Kilifi	127	14	141
Kwale	80	11	91
Total	313	110	423

Table 2. Number of transformers the JICA Team revised

County	Number of Transformers (Maximization)	Number of Transformers (Extension and Maximization)	Total Number of Transformers
Nakuru	47	49	96
Nyandarua	50	35	85
Kilifi	120	14	134
Kwale	77	11	88
Total	294	109	403

Table3. Maximization Site  
Nakuru County

NO	REFERENCES	NAME OF SCHEME	CONSTITUENCY	S/S No.	Description	Customers	
						Proposal	After Survey
1	J23102016080104	MILCAH MAINA NJERI	GILGIL	18649	18649 - gilgil	15	3
2	J23102016080144	JEMUNGE JAMES	NAKURU WEST	35938	35938 - UPPERHILL ESTATE	25	7
3	J23102016080212	NANCY CHEROTICH	NJORO	34401	34401 - KIROBONI NGATA	14	1
4	J23102016080213	WAHOME NGUNJIRI FRANCIS	BAHATI	17590	17590 - MAILI KUMI_BAHATI	17	3
5	J23102016080214	ALEXANDER KENDUIYA KIPLANGAT	NJORO	17557	17557 - OGILGEI	10	1
6	J23102016080215	JOHN TUMBO KINUTHIA	NJORO	18577	18577 - NAISHI BONDENI	12	3
7	J23102016080216	SERAH KAMAU WAMBUI	NJORO	18560	18560 - TIPIS MKT	16	29
8	J23102016080217	JOHN THERERE NJOROGE	NJORO	17716	17716 - STORE MBILI	9	19
9	J23102016080219	SAMUEL NJOROGE	NAKURU EAST	35478	35478 - SOBEA	6	4
10	J23102016080221	JORAM MARU NDARUGA	NJORO	5896	05896 - Rongai Water Works	16	56
11	J23102016080222	NYOIKE NDUMBI NJOROGE	NJORO	5082	05082 - Piavi Estate & W/Shop	10	5
12	J23102016090009	ROBERT WANYOIKE NGARUIYA	RONGAI	35296	35296 - C.B.C BANITA	40	26
13	J23102016090015	MAUREEN MACHARIA NYOKABI	BAHATI	5704	05704 - Mchanganyiko Estate	20	15
14	J23102016090016	PATRICK MARO MAINA	BAHATI	18277	18277 - ENGASHURA FARM (JOHN NDEGWA) BAHATI	30	37
15	J23102016090017	PAUL KIUGU KIRIMI	NAKURU EAST	109187	109187 - EAST GATE PRE INVESTMENT	14	13

16	J23102016090018	PAUL MUTAI KIPKOECH	MOLO	35700	35700 - MULIMA SEC/ PRY. SCHOOLS	65	42
17	J23102016090019	ROSE KOSKEI CHEMUTAI	NJORO	18966	18966 - Ngata Farm	14	4
18	J23102016090024	PETER NJUGUNA MWANIKI	NAIVASHA	17377	17377 - RUTH WANJIKU	12	23
19	J23102016090029	ANTHONY WANJAU WACHIRA	BAHATI	5629	05629 - Bahati Centre	14	3
20	J23102016090030	STANSLOUS WAKAHIU WANJAU	BAHATI	18068	18068 - KARUNGA CENTRE	12	31
21	J23102016090035	MICHAEL KAMAU WARUINGI	BAHATI	17885	17885 - EDGE FARM	37	23
22	J23102016090045	JOHN NJOROGI MAINA	BAHATI	35295	35295 - C.B.C ARAHUKA	40	16
23	J23102016090049	NAFTALY MAINA MURAGE	NAKURU EAST	35429	35429 - MUGUGA LANET	15	5
24	J23102016090053	JOHN GICHOHI GICHUKI	NAKURU EAST	18044	18044 - UMOJA MUWA	10	6
25	J23102016090056	JOHN KAMUNDU KARANJA	NAKURU EAST	17182	17182 - Baruk Centre	15	4
26	J23102016090058	VIRGINIA KARANJA NYAMBURA	GILGIL	136738	NAIVASHA SUBSTATION ( 132 / 33 KV)	25	6
27	J23102016090059	JAMES KAMAU NGANGA	MOLO	17311	17311 - Salgaa Trading Centr	130	78
28	J23102016090060	JOHNSTONE BETT KIPNGETICH	NJORO	17556	17556 - OGILGEI	15	12
29	J23102016090061	PETER NGARI MURAGE	BAHATI	18788	18788 - REINFORCEMENT MUCHONJORU FARM-BAHATI	20	19
30	J23102016090063	MILLICENT AMAM LILJIAN AKOTH	NAIVASHA	108840	NAIVASHA SUBSTATION ( 132 / 33 KV)	20	6
31	J23102016090070	OMBUI GICHANA JADSON	NAKURU WEST	5062	05062 - KAMASAAI B/H	15	9
32	J23102016090073	STEPHEN NGUGI KAKERE	RONGAI	35339	35339 - SIRIKWA T/C & SEC.SCHOOL	36	25
33	J23102016090077	BEULAH SANCTUARY	MOLO	5144	05144 - Tarakwet (Aremi)	19	20

34	J23102016090082	MORIS GITATI NGUNYI	NJORO	50020	50020 - C.B.C. BAGARIA AREA-03	31	30
35	J23102016090083	STEPHEN MACHARIA MBURU	NAKURU EAST	17245	17245 - Wine Wood Saw Mills	23	19
36	J23102016090093	JOSEPH KIMANI MWANGI	NAKURU EAST	17589	17589 - GITURA COFFE FACTORY	19	24
37	J23202016080051	DAVID WANJIKU	NAIVASHA	18490	18490 - KIKOPEY	30	4
38	J23202016090031	JOHN MWANIKI KURIA	NAIVASHA	50948	50948 - CBC KINUNGI	57	27
39	J23202016090038	CECILIA WANJIRU KIRIBA	NAIVASHA	34788	34788 - K.P.C_Eburu Camp	22	65
40	J23202016090041	NDABIBI PRIMARY AND ENVIRONS	NAIVASHA	18479	18479 - Ndabibi Primary School	80	2
41	J23202016090049	KIKOPEY & TRINITY CHURCH & ENVIRONS	NAIVASHA	17787	GILGIL ( 33 / 11 KV)	11	15
42	J23202016090056	KIKOPEY CHILDRENS HOME & ENVIRONS	NAIVASHA	51609	GILGIL ( 33 / 11 KV)	22	35
43	J23202016090060	NGUMO PRIMARY AND ENVIRONS	NAIVASHA	102615	GILGIL TOWN 11KV EX GILGI	41	26
44	J23202016090066	K.A.G CHURCH - EBURRU	NAIVASHA	17013	17013 - K.P.C_Eburu Camp	26	36
45	J23202016090072	CASSAM CHURCH DELIVERANCE	NAIVASHA	5284	05284 - Local Tx_Gilgil S/S	16	19
46	J23202016100001	JOHN WANYOIKE KANYOORI	NAIVASHA	34242	34242 - MWICIRIGI MARKET -KINUNGUI	30	43
47	J23502016090008	SAMUEL RUTO KIPKOECH	ELBURGON	50428	50428 - SIMOTWET PRIMARY	34	5
Total Customers						1,210	905

Nyandarua County

NO	REFERENCES	NAME OF SCHEME	CONSTITUENCY	S/S	Description	Customers
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				No.			Proposal	After Survey
1	J23302016080033	ESTHER MUNIA GATHIGIA	NDARAGWA	51153	OLKALOU SUBSTATION ( 11,33 / 11 KV)		97	10
2	J23302016090015	DANIEL KARANU KOINE	KINANGOP	17121	NAIVASHA SUBSTATION ( 132 / 33 KV)		46	31
3	J23302016090022	JAMES NGUGI KINYANJUI	KINANGOP	34399	34399 - GATHARA MARKET		50	13
4	J23302016090027	ISAAC MWANGI MAINA	KINANGOP	34812	34812 - YAANGA B/ELEC PROJECT		40	22
5	J23302016090030	LUCY NGANGA WANJIKU	KINANGOP	34614	34614 - DEDAN MWENDA MATUNDURI		40	41
6	J23302016090065	MWANGI KIMEMIA	KINANGOP	18555	18555 - LERESHA SECONDARY SCHOOL		35	12
7	J23302016090082	JOSEPH NJUGUNA NGANGA	KINANGOP	18035	NAIVASHA SUBSTATION ( 132 / 33 KV)		76	66
8	J23302016090086	JOSEPH MURUGAMI WAIRIA	OLKALOU	17798	17798 - KIRIMA VILLAGE		50	35
9	J23302016090087	PETER GACHOKA THIONGO	KINANGOP	35940	NAIVASHA SUBSTATION ( 132 / 33 KV)		48	6
10	J23302016090088	STEPHEN MUNDIA MACHARIA	KINANGOP	35939	35939 - CBC SASUMUA DAM		51	18
11	J23302016090090	VERONICA NJUGUNA WANGARI	KINANGOP	35088	NAIVASHA SUBSTATION ( 132 / 33 KV)		56	14
12	J23302016090099	MORRIS NGOMANO KARUNGA	OLKALOU	17382	17382 - Kapten Market		60	5
13	J23302016090106	STEPHEN NDUNGU KIARIE	OLJOOROROK	35617	35617 - GIKINGI PRI SCHOOL		50	19
14	J23302016090111	BONIFACE MWANGI GITHUKU	OLKALOU	17379	17379 - Mugumo Water Project		61	33
15	J23302016090113	PETER MUTHUI CHEGE	NDARAGWA	35855	35855 - CBC MUTANGA		90	7
16	J23302016090114	GIDEON GITAU MBUGUA	OLJOOROROK	35614	35614 - HAITI ADMINISTRATION		62	17
17	J23302016090115	JOSEPH MUCHIRI GACHUIRI	OLKALOU	50268	50268 - Mugumo SELF GROUP		60	74
18	J23302016090119	FRANCIS THEURI WACHIRA	OLJOOROROK	35609	NAIVASHA SUBSTATION ( 132 / 33 KV)		64	24
19	J23302016090125	DAVID GITHINJI NYAGA	NDARAGWA	18529	18529 - KWA KUNGU T CENTRE		48	23
20	J23302016090126	CHARLES MACHARIA NDUNGU	NDARAGWA	107724	107724 - KARAGOINI PCEA CHURCH		135	14
21	J23302016090128	CECILIA MWANGI WANGARI	NDARAGWA	34341	34341 - KIHARA SCHOOLS		120	6
22	J23302016090133	PETER KANINI MWANIKI	NDARAGWA	18433	18433 - LESHAO PONDO		72	70

23	J23302016090135	JAMES MAINA GATHU	NDARAGWA	17854	17854 - NDARAGWA CENTER	79	15
24	J23302016090138	DAVID NJIHIA MAINA	OLKALOU	34224	34224 - RURII	25	49
25	J23302016090144	SAMUEL MUNDATI MUGO	NDARAGWA	17159	17159 - Shauri Market	80	10
26	J23302016090147	CHARLES WANGAI WAGURA	NDARAGWA	17161	17161 - Hon Kimondo Wagura	54	17
27	J23302016090148	ESTHER GAITA WAMUCHII	NDARAGWA	50680	50680 - MUNGETHO B/HOLE	108	32
28	J23302016090149	FRANCIS MUTHOGA MUCHERU	OLKALOU	17999	17999 - Olkalou Holdings	67	12
29	J23302016090150	JOSEPH KAMERI MURIUKI	OLJOROROK	18850	18850 - SIMBARA MARKET	76	27
30	J23302016090151	JULIA NDUNGU WANJIRU	NDARAGWA	34343	34343 - SUBUK TOWNSHIP	84	46
31	J23302016090160	JAMES NUGUNA THIRU	KIPIPIRI	106401	106401 - GACHWE PRIMARY SCHOOL	53	10
32	J23302016090161	RICHARD MUBIRI MAINA	NDARAGWA	102175	102175 - LESHAU PONDO COMMUNITY	48	26
33	J23302016090163	RAHAB NJUGUNA WANJIRU	OLKALOU	50244	50244 - GENERAL KARANGI JULIUS	40	20
34	J23302016090164	JOSEPH MAINA KAMAU	NDARAGWA	50394	NYAHURURU 11K V EX NYAHURU	46	90
35	J23302016090165	FRANCIS GICHUKI MWANIKI	OLJOROROK	34374	34374 - kasuku	51	38
36	J23302016090166	PETER KIHUMBA KARIUKI	OLJOROROK	113833	113833 - GATHUDIA MARKET	47	79
37	J23302016090167	GODFREY KIMOTHO & OTHERS NJUGUNA	OLJOROROK	109007	OLKALAU 11KV EX NYAHURURU	49	12
38	J23302016090168	VERONICA GITONGA WANJIKU	OLJOROROK	35394	OLKALAU 11KV EX NYAHURURU	50	40
39	J23302016090170	SIMON NDIRANGU NDUNGU	OLKALOU	34098	34098 - KANJUJIRI SEC. SCHOOL	80	16
40	J23302016090171	MARY MACHUA NJERI	KINANGOP	35805	35805 - KIHUMBU SCHOOL	70	58
41	J23302016090172	PAUL CHEGE WAITHAKA	KINANGOP	50966	50966 - TULAGA LINE MOJA	70	54
42	J23302016090173	ROBERT KIMOTHO MACHARIA	KINANGOP	18527	18527 - ENGINEER TC	50	31
43	J23302016090174	KIROGONI NGORIKA VILLAGE	OLKALOU	17551	17551 - MAHOME & OTHERS	50	19
44	J23302016090179	FRANCIS NDONGA NGUTHI	OLJOROROK	35090	35090 - kirimangai mkt	90	49
45	J23302016090185	DAVID KAGIRI MURIGI	OLKALOU	17468	17468 - Rurii Center	92	19

46	J23302016090198	ISAAC NDEGEREGE GACHUHI	NDARAGWA	34342	34342 - KANYAGIA CENTRE	91	93
47	J23302016090216	JAMES KIMANI MACHARIA	KINANGOP	18574	18574 - MWENDANDU MKT	30	58
48	J23302016100004	JOSEPH MBURU GATUGUTA	KINANGOP	17267	17267 - Murungaru Centre	180	30
49	J23302016100011	FRANCIS NGUTHI WAWERU	KINANGOP	35133	35133 - YAANGA PRI./SECONDARY SCHOOL	30	48
50	J23302016100012	STEPHEN KARANJA NJOROGE	OLKALOU	50801	50801 - PASSENGA AREAS	25	27
Total Customers						3226	1585

#### Kilifi County

NO	REFERENCES	NAME OF SCHEME	CONSTITUENCY	S/S No.	Description	Customers	
						Proposal	After Survey
1	J22122016060014	LAST MILE MAX. S/S 07006 RIBE VILLAGE - KALOENI	KALOENI	07006	07006 RIBE VILLAGE -	43	48
2	J22122016060015	LAST MILE MAX. S/S 07007 RIBE VILLAGE KALOENI KILIFI	KALOENI	07007	07007 RIBE VILLAGE K	41	24
3	J22122016060040	LAST MILE MAX. S/S 6533 TAKAUNGU - KILIFI	KILIFI NORTH	6533	6533 TAKAUNGU - KILI	68	87
4	J22122016060049	LAST MILE MAX. S/S 7187 KILIFI TOWN	KILIFI NORTH	7187	7187 KILIFI TOWN	47	36
5	J22122016060051	LAST MILE MAX. S/S 7352 - KILIFI TOWN	KILIFI NORTH	7352	7352 - KILIFI TOWN	40	76

6	J22122016060127	LAST MILE MAX. S/S 19538 JIBANA - KILIFI	KALOLENI	19538	19538 JIBANA - KILIF	72	76
7	J22122016060172	LAST MILE S/S 19395 MARIAKANI	KALOLENI	19395	19395 MARIAKANI	73	20
8	J22122016060174	LAST MILE S/S 7308 MUSUMARI	KILIFI SOUTH	7308	7308 MUSUMARI	63	38
9	J22122016070012	LAST MILE S/S 36147 MNAZIMWENGA	KALOLENI	36147	36147 MNAZIMWENGA	48	29
10	J22122016070036	LAST MILE S/S 102296 MUYUWA	KILIFI NORTH	102296	102296 MUYUWA	56	32
11	J22122016070046	LAST MILE S/S 07595 KADZUHONI	KILIFI SOUTH	07595	07595 KADZUHONI	64	38
12	J22122016070048	LAST MILE S/S 20327 WAKALA	KILIFI SOUTH	20327	20327 WAKALA	71	64
13	J22122016070068	LAST MILE S/S 102293 MUYU WA KAE - MWAMBURUI	MALINDI	102293	102293 MUYU WA KAE -	57	26
14	J22122016070074	LAST MILE S/S 7519 KIJIWETANGA	MALINDI	7519	7519 KIJIWETANGA	41	10
15	J22122016070076	LAST MILE S/S 6647 KILIFI	KILIFI NORTH	6647	6647 KILIFI	39	17
16	J22122016070086	LAST MILE S/S 19700 KWADEMU	KALOLENI	19700	19700 KWADEMU	47	4
17	J22122016070088	LAST MILE S/S 19701 KWA DEMU KALOLENI	KALOLENI	19701	19701 KWA DEMU KALOL	38	14
18	J22122016070109	LAST MILE S/S 7317 KILIFI	KILIFI SOUTH	7317	7317 KILIFI	48	21
19	J22122016070113	LAST MILE S/S 7538 MALINDI	MALINDI	7538	7538 MALINDI	73	31
20	J22122016070154	LAST MILE S/S 6749 GEDE MONUMENTS	MALINDI	6749	6749 GEDE MONUMENTS	70	6
21	J22122016070160	LAST MILE S/S 7073 BOFA	KILIFI NORTH	7073	7073 BOFA	39	6
22	J22122016070169	LAST MILE S/S 6245 MARIAKANI	KALOLENI	6245	6245 MARIAKANI	59	18
23	J22122016070204	LAST MILE MAX. S/S 6657 VIPNGO - KILIFI	KILIFI SOUTH	6657	6657 VIPNGO - KILIFI	47	8



24	J22122016070212	LAST MILE S/S 19935 MILE DIDA	GANZE	19935	19935 MILE DIDA	48	3
25	J22122016070215	LAST MILE S/S 19553 MTWAPA	KILIFI SOUTH	19553	19553 MTWAPA	50	38
26	J22122016070216	LAST MILE MAX. S/S 7241 KANAMAI - KILIFI	KILIFI NORTH	7241	7241 KANAMAI - KILIFI	31	5
27	J22122016070217	LAST MILE S/S 6469 WATAMU	MALINDI	6469	6469 WATAMU	57	34
28	J22122016070227	LAST MILE S/S 6355 BITUMEN	RABAI	6355	6355 BITUMEN	58	40
29	J22122016080070	LAST MILE S/S 7103 SOKOKE	GANZE	7103	7103 SOKOKE	45	39
30	J22122016080075	LAST MILE S/S 7573 WATER WORKS	KILIFI NORTH	7573	7573 WATER WORKS	70	34
31	J22122016080117	LAST MILE S/S 19214 TAKAUNGU	KILIFI SOUTH	19214	19214 TAKAUNGU	42	47
32	J22122016080123	LAST MILE S/S 36034 HON. GUNGA	KALOLENI	36034	36034 HON. GUNGA	68	72
33	J22122016080126	LAST MILE S/S 20995 KINARANI	KALOLENI	20995	20995 KINARANI	49	80
34	J22122016080127	LAST MILE S/S 20824 MWANGAZA PRY S.	KALOLENI	20824	20824 MWANGAZA PRY S	34	48
35	J22122016080128	LAST MILE S/S 20825 MWANGAZA MARKET	KALOLENI	20825	20825 MWANGAZA MARKE	53	12
36	J22122016080130	LAST MILE S/S 7019 R. N. KAZUNGU	MALINDI	7019	7019 R. N. KAZUNGU	33	20
37	J22122016080144	LAST MILE S/S 19718 KABATHENI MKT	KALOLENI	19718	19718 KABATHENI MKT	66	45
38	J22122016080152	LAST MILE S/S 20430 MAVUENI T/C	KILIFI SOUTH	20430	20430 MAVUENI T/C	64	30
39	J22122016080163	LAST MILE S/S 7189 JARIBUNI	KILIFI SOUTH	7189	7189 JARIBUNI	67	35
40	J22122016080183	LAST MILE S/S 20880 TAKAUNGU	KILIFI SOUTH	20880	20880 TAKAUNGU	49	25
41	J22122016080201	LAST MILE S/S 6461 MWAMBRUI	MALINDI	6461	6461 MWAMBRUI	47	30
42	J22122016080215	LAST MILE S/S 6465 SABAKI	MALINDI	6465	6465 SABAKI	64	15
43	J22122016080219	LAST MILE S/S 6455 SABAKI	MALINDI	6455	6455 SABAKI	61	20

44	J22122016080224	LAST MILE S/S 6411 KISIMA	MALINDI	6411	6411 KISIMA	57	30
45	J22122016080246	LAST MILE S/S 19529 VIRAGONI	KALOLENI	19529	19529 VIRAGONI	57	12
46	J22122016080264	LAST MILE S/S 6564 MTWAPA	KILIFI SOUTH	6564	6564 MTWAPA	46	56
47	J22122016080266	LAST MILE S/S 7242 MTWAPA	KILIFI SOUTH	7242	7242 MTWAPA	41	22
48	J22122016080268	LAST MILE S/S 20169 MTWAPA	KILIFI SOUTH	20169	20169 MTWAPA	72	24
49	J22122016080396	LAST MILE S/S 20034 MARIAKANI SLAUGHTER	KALOLENI	20034	20034 MARIAKANI SLAU	50	50
50	J22122016080413	LAST MILE S/S 20740 BOMANI	KILIFI SOUTH	20740	20740 BOMANI	57	50
51	J22122016080478	LAST MILE S/S 6473 KIRUBI	GANZE	6473	6473 KIRUBI	52	36
52	J22122016080487	LAST MILE S/S 106382 MIGUMOMIRI	KALOLENI	106382	106382 MIGUMOMIRI	46	15
53	J22122016080501	LAST MILE S/S 101735 KALONGONI	KALOLENI	101735	101735 KALONGONI	60	37
54	J22122016080506	LAST MILE S/S 20484 NZOVUNI	GANZE	20484	20484 NZOVUNI	40	23
55	J22122016080521	LAST MILE S/S 107277 CHAPUNGU	GANZE	107277	107277 CHAPUNGU	74	36
56	J22122016080534	LAST MILE S/S 19932 KACHORORONI	KILIFI SOUTH	19932	19932 KACHORORONI	39	31
57	J22122016080536	LAST MILE S/S 7884 MWAHERA	GANZE	7884	7884 MWAHERA	41	11
58	J22122016080545	LAST MILE S/S 19755 MUHONI	GANZE	19755	19755 MUHONI	54	20
59	J22122016080548	LAST MILE S/S 107275 MITANGANI	MALINDI	107275	107275 MITANGANI	63	46
60	J22122016080552	LAST MILE S/S 20247 MRIMA	KALOLENI	20247	20247 MRIMA	64	23
61	J22122016080554	LAST MILE S/S 19981 MEKATILILI	MALINDI	19981	19981 MEKATILILI	58	36
62	J22122016080576	LAST MILE S/S 7058 BANDARI MKT	GANZE	7058	7058 BANDARI MKT	59	28
63	J22122016080578	LAST MILE S/S 102121 MASEMO PRY	GANZE	102121	102121 MASEMO PRY	52	22
64	J22122016080583	LAST MILE S/S 19937 CHIEF KIRAO	KILIFI SOUTH	19937	19937 CHIEF KIRAO	45	12
65	J22122016090009	LAST MILE S/S 7111 MAWENI	KILIFI SOUTH	7111	7111 MAWENI	64	7
66	J22122016090010	LAST MILE S/S 106540 KALONGONI	KILIFI SOUTH	106540	106540 KALONGONI	65	35

67	J22122016090024	LAST MILE S/S 103700 KWA ABUDU	KALOENI	103700	103700 KWA ABUDU	68	69
68	J22122016090031	LAST MILE S/S 106350 BODOI/KIKAMBALA	KILIFI SOUTH	106350	106350 BODOI/KIKAMBABA	47	41
69	J22122016090046	LAST MILE S/S 104366 MALINDI	MALINDI	104366	104366 MALINDI	66	24
70	J22122016090059	LAST MILE S/S 20440 MBOMBONI	KILIFI SOUTH	20440	20440 MBOMBONI	39	15
71	J22122016090110	LAST MILE S/S 19398	KILIFI SOUTH	19398	19398	42	3
72	J22122016090127	LAST MILE S/S 116548 KAVUNYALO	MALINDI	116548	116548 KAVUNYALO	37	29
73	J22122016090133	LAST MILE S/S 117519 MARIAKANI	KALOENI	117519	117519 MARIAKANI	52	5
74	J22122016090167	LAST MILE S/S 20006 MAXIMIZATION	KILIFI NORTH	20006	20006 MAXIMIZATION	56	47
75	J22122016090175	LAST MILE S/S 19487	KILIFI NORTH	19487	19487	75	63
76	J22122016090179	LAST MILE S/S 7269 ST. MARY'S	KILIFI SOUTH	7269	7269 ST. MARY'S	36	39
77	J22122016090180	LAST MILE S/S 19652 CHILA	KILIFI SOUTH	19652	19652 CHILA	57	9
78	J22122016090186	LAST MILE S/S 19551 MTAPENI	KILIFI SOUTH	19551	19551 MTAPENI	56	46
79	J22122016090191	LAST MILE S/S 122441 MAXIMISATION	KILIFI NORTH	122441	122441 MAXIMISATION	33	15
80	J22122016090207	LAST MILE S/S 19216 RAMADA	MALINDI	19216	19216 RAMADA	71	9
81	J22122016090214	LAST MILE S/S 20186 GARASHI	MAGARINI	20186	20186 GARASHI	64	74
82	J22122016090215	LAST MILE S/S 20321 SAFARICOM	MALINDI	20321	20321 SAFARICOM	48	20
83	J22122016090218	LAST MILE S/S 19977 KADZIFITSENI	MAGARINI	19977	19977 KADZIFITSENI	45	20
84	J22122016090227	LAST MILE S/S 20044 MAKOBENI	KALOENI	20044	20044 MAKOBENI	40	55
85	J22122016090228	LAST MILE S/S 7009 BONDORA	KALOENI	7009	7009 BONDORA	69	42
86	J22122016090255	LAST MILE S/S 7507 D. RICCI	MALINDI	7507	7507 D. RICCI	31	8
87	J22122016090279	LAST MILE S/S 102292 KINANGONI	RABAI	102292	102292 KINANGONI	50	28
88	J22122016090283	LAST MILE S/S 107330 SHOMELA	MALINDI	107330	107330 SHOMELA DISP.	31	28

89	J22122016090288	DISP. LAST MILE S/S 107329 KABIBUNI PRY	MALINDI	107329	107329 KABIBUNI PRY	58	71
90	J22122016090298	LAST MILE S/S 20736 BUUNI DETENI	RABAI	20736	20736 BUUNI DETENI	58	46
91	J22122016090303	LAST MILE S/S 19930 BOFU	KALOLENI	19930	19930 BOFU	63	4
92	J22122016090317	LAST MILE S/S 20160 MAGADINI	KALOLENI	20160	20160 MAGADINI	43	93
93	J22122016090320	LAST MILE S/S 6253 MAZERAS	RABAI	6253	6253 MAZERAS	66	52
94	J22122016090354	LAST MILE S/S 20458 ANZAZI FARM	KILIFI SOUTH	20458	20458 ANZAZI FARM	50	42
95	J22122016090360	LAST MILE S/S 103923 DABASO	MALINDI	103923	103923 DABASO	72	43
96	J22122016090365	LAST MILE S/S 20957 CHIPANDE PRY	MALINDI	20957	20957 CHIPANDE PRY	50	10
97	J22122016090374	LAST MILE S/S 20576 MBARAKACHEMBE	MALINDI	20576	20576 MBARAKACHEMBE	57	36
98	J22122016090395	LAST MILE S/S 20027 MUSKAN	MALINDI	20027	20027 MUSKAN	45	28
99	J22122016090425	LAST MILE S/S 19328 KIPEPEO	MALINDI	19328	19328 KIPEPEO	45	60
100	J22122016090429	LAST MILE S/S 19008 MELINA	KILIFI SOUTH	19008	19008 MELINA	42	35
101	J22122016090457	LAST MILE S/S 20386 WATAMU	MALINDI	20386	20386 WATAMU	35	13
102	J22122016090479	LAST MILE S/S 117601 UFUONI	KILIFI SOUTH	117601	117601 UFUONI	64	26
103	J22122016100105	LAST MILE S/S 6444 GANDA	MALINDI	6444	6444 GANDA	75	16
104	J22122016100106	LAST MILE S/S 7144 EDUCATION FAMILY LIFE	KILIFI NORTH	7144	7144 EDUCATION FAMIL	37	21
105	J22122016100110	LAST MILE S/S 7522 MALINDI	MALINDI	7522	7522 MALINDI	50	39
106	J22122016100113	LAST MILE S/S 7691 MINISTRY	MALINDI	7691	7691 MINISTRY	61	20
107	J22122016100144	LAST MILE S/S 116595 MAXIMIZATION	GANZE	116595	116595 MAXIMIZATION	58	34

108	J22122016100146	LAST MILE S/S 116598	GANZE	116598	116598	13
109	J22122016100171	LAST MILE S/S 6477 GEDE FOREST	MALINDI	6477	6477 GEDE FOREST	18
110	J22122016100186	LAST MILE S/S 20481 KONJERA	KILIFI NORTH	20481	20481 KONJERA	33
111	J22122016100204	LAST MILE S/S 7074 CELTEL	KILIFI SOUTH	7074	7074 CELTEL	15
112	J22122016100210	LAST MILE S/S 6747 L. RIEDL	MALINDI	6747	6747 L. RIEDL	26
113	J22122016100225	LAST MILE S/S 20204 JACARANDA HOTELS	MALINDI	20204	20204 JACARANDA HOTE	35
114	J22122016110011	LAST MILE S/S 106829 KILIFI NORTH	KILIFI NORTH	106829	106829 KILIFI NORTH	24
115	J22122016110069	LAST MILE S/S 7166 J. R. KINUTHIA	KILIFI SOUTH	7166	7166 J. R. KINUTH	9
116	J22122016110077	LAST MILE S/S 6344 ABDALLA KHAMIS	KALOLENI	6344	6344 ABDALLA KHAMIS	53
117	J22122016110078	LAST MILE S/S 20724 KAPTUKU STELLA KATWA KOKOTONI	KALOLENI	20724	20724 KAPTUKU STELLA	53
118	J22122016110081	LAST MILE S/S 20212 SYSTEM REIN - MARIAKANI	KALOLENI	20212	20212 SYSTEM REIN -	19
119	J22122016110090	LAST MILE S/S 36004 KINAGONI VILLAGE GOTANI	KALOLENI	36004	36004 KINAGONI VILLA	37
120	J22122016110108	LAST MILE S/S 20237 MIYANI SEC SCH.	KALOLENI	20237	20237 MIYANI SEC SCH	28
TOTAL Customers						3804

Kwale County

NO	REFERENCES	NAME OF SCHEME	CONSTITUENCY	S/S	Description	Customers
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					No.			Proposal	After Survey
1	J22112016060013	LAST MILE S/S 7775 BUGA VILLAGE VUGA TSIMBA	MATUGA	7775	7775 BUGA VILLAGE VU	49	22		
2	J22112016060173	LAST MILE MAX. S/S 6875 TIWI MATUGA KWALE	MATUGA	6875	6875 TIWI MATUGA KWA	43	32		
3	J22112016080088	LAST MILE S/S 19183 MTSANGATAMU	MATUGA	19183	19183 MTSANGATAMU	60	33		
4	J22112016080185	LAST MILE S/S 20771 MAJIMOTO DISPENSARY	LUNGALUNGA	20771	20771 MAJIMOTO DISPE	47	33		
5	J22112016080197	LAST MILE S/S 20899 KIRUKU PRY SCH.KIKONENI	LUNGALUNGA	20899	20899 KIRUKU PRY SCH	60	28		
6	J22112016080205	LAST MILE S/S 104153 KALALANI	KINANGO	104153	104153 KALALANI	46	11		
7	J22112016080224	LAST MILE S/S 19764 MWANGWEI PRY SCH.	LUNGALUNGA	19764	19764 MWANGWEI PRY S	53	42		
8	J22112016080269	LAST MILE S/S 20775 KIKONENI SEC. SCH.	MALINDI	20775	20775 KIKONENI SEC.	62	34		
9	J22112016080285	LAST MILE S/S 120509 KIDAMAYA	MSAMBWENI	120509	120509 KIDAMAYA	48	18		
10	J22112016080288	LAST MILE S/S 112221 BWITI PRY SCH	LUNGALUNGA	112221	112221 BWITI PRY SCH	46	55		
11	J22112016090179	LAST MILE S/S 19369 KINONDO	MATUGA	19369	19369 KINONDO	56	43		
12	J22112016090183	LAST MILE S/S 20725 JUMA B. SEF	MSAMBWENI	20725	20725 JUMA B. SEF	51	51		
13	J22112016090202	LAST MILE S/S 107366 KIZUMBZAN	MSAMBWENI	107366	107366 KIZUMBZAN	55	10		
14	J22112016090203	LAST MILE S/S 119770 MAGAONI	MSAMBWENI	119770	119770 MAGAONI	49	38		

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15	J22112016090219	LAST MILE S/S 102453 MAGODI	MSAMBWENI	102453	102453 MAGODI	43	16
16	J22112016090247	LAST MILE S/S 7718 PINEWOOD	MATUGA	7718	7718 PINEWOOD	52	13
17	J22112016090253	LAST MILE S/S 103995 JIVANJI HUSSEIN	MSAMBWENI	103995	103995 JIVANJI HUSSE	61	26
18	J22112016090263	LAST MILE S/S 19262 OPP. CHELSEA	MSAMBWENI	19262	19262 OPP. CHELSEA	43	8
19	J22112016100005	LAST MILE S/S 20982 MKANDA PRIMARY	MATUGA	20982	20982 MKANDA PRIMARY	53	32
20	J22112016100008	LAST MILE S/S 20785 MIWANI	MSAMBWENI	20785	20785 MIWANI	58	25
21	J22112016100011	LAST MILE S/S 19791 KIKAMBANI	MSAMBWENI	19791	19791 KIKAMBANI	45	23
22	J22112016100016	LAST MILE S/S 119692 DIMA	MATUGA	119692	119692 DIMA	56	65
23	J22112016100018	LAST MILE S/S 20953 KWA MUSA BOREHOLE	MSAMBWENI	20953	20953 KWA MUSA BOREH	44	17
24	J22112016100020	LAST MILE S/S 119778 MWANZWZNI	MATUGA	119778	119778 MWANZWZNI	60	47
25	J22112016100021	LAST MILE S/S 7767 PEMBA CHANNEL	LUNGALUNGA	7767	7767 PEMBA CHANNEL	45	8
26	J22112016100024	LAST MILE S/S 20956 TUMAINI	MSAMBWENI	20956	20956 TUMAINI	46	13
27	J22112016100029	LAST MILE S/S 103673 MWAMTOBO PRIMARY	LUNGALUNGA	103673	103673 MWAMTOBO PRIM	52	24
28	J22112016100069	LAST MILE S/S 7844 KWALE MEDICAL	MATUGA	7844	7844 KWALE MEDICAL	59	17
29	J22112016100082	LAST MILE S/S 113839 KIDZADZE	MATUGA	113839	113839 KIDZADZE	54	37
30	J22112016100084	LAST MILE S/S 113840 KIDZUNU	MATUGA	113840	113840 KIDZUNU	42	45
31	J22112016100095	LAST MILE S/S 19106 GODONI	MATUGA	19106	19106 GODONI	59	20
32	J22112016100115	LAST MILE S/S 120010 VYONGWANI	MATUGA	120010	120010 VYONGWANI	55	44

33	J22112016100119	LAST MILE S/S 103638 MWELE PRY SCH.	MATUGA	103638	103638 MWELE PRY SCH	50	15
34	J22112016100134	LAST MILE S/S 7846 GOLINI	MATUGA	7846	7846 GOLINI	49	23
35	J22112016100136	LAST MILE S/S 36111 BOYANI PRY SCH.	MSAMBWENI	36111	36111 BOYANI PRY SCH	59	22
36	J22112016100137	LAST MILE S/S 36113 JOHO PRY SCH.	LUNGALUNGA	36113	36113 JOHO PRY SCH.	59	22
37	J22112016100143	LAST MILE S/S 19363 KWA D/O.	MATUGA	19363	19363 KWA D/O.	45	8
38	J22112016100169	LAST MILE S/S 182656 MWANANYATI	MATUGA	182656	182656 MWANANYATI	62	32
39	J22112016100218	LAST MILE S/S 107373 FOOT PRT	MATUGA	107373	107373 FOOT PRT	43	13
40	J22112016100222	LAST MILE S/S 124552 NGAURO PRY SCHOOL	KINANGO	124552	124552 NGAURO PRY SC	43	30
41	J22112016100224	LAST MILE S/S 19761 SYSTEM REIN.	MATUGA	19761	19761 SYSTEM REIN.	53	45
42	J22112016100234	LAST MILE S/S 101738 MSULWA MKT	MATUGA	101738	101738 MSULWA MKT	41	23
43	J22112016110008	LAST MILE S/S 112207 MIAMBA PRY SCH.	MATUGA	112207	112207 MIAMBA PRY SC	50	37
44	J22122016070232	LAST MILE S/S 36114 MAJENGO MKT	KINANGO	36114	36114 MAJENGO MKT	61	23
45	J22122016070233	LAST MILE S/S 36115 MAJENGO PRY SCH.	KINANGO	36115	36115 MAJENGO PRY S	48	29
46	J22122016070250	LAST MILE S/S 20158 MABESHENI	KINANGO	20158	20158 MABESHENI	50	18
47	J22122016070253	LAST MILE S/S 20156 MATUMBI	KINANGO	20156	20156 MATUMBI	43	27
48	J22122016080037	LAST MILE S/S 104480 MWALUKOMBE	KINANGO	104480	104480 MWALUKOMBE	50	12



49	J22122016080039	LAST MILE S/S 104479 MWALUKOMBE	KINANGO	104479	104479 MWALUKOMBE	44	31
50	J22122016080046	LAST MILE S/S 104399 MBULUNI	KINANGO	104399	104399 MBULUNI	45	34
51	J22122016080103	LAST MILE S/S 125511 TUMAINI PRY SCH.	KINANGO	125511	125511 TUMAINI PRY S	42	20
52	J22122016080110	LAST MILE S/S 36393 NUNGUNI PRY SCH.	KINANGO	36393	36393 NUNGUNI PRY SC	59	19
53	J22122016080227	LAST MILE S/S 36137 MWABILA	KINANGO	36137	36137 MWABILA	58	18
54	J22122016100004	LAST MILE S/S 19361 TARU SEC.	KINANGO	19361	19361 TARU SEC.	49	21
55	J22122016100010	LAST MILE S/S 7897 MWAVUMBO SEC.	KINANGO	7897	7897 MWAVUMBO SEC.	42	43
56	J22122016100017	LAST MILE S/S 104148 CHIFUSINI	KINANGO	104148	104148 CHIFUSINI	48	20
57	J22122016100023	LAST MILE S/S 20234 GONZI RAI	KINANGO	20234	20234 GONZI RAI	62	19
58	J22122016100033	LAST MILE S/S 126072 CHIVUNDE	KINANGO	126072	126072 CHIVUNDE	46	25
59	J22122016100038	LAST MILE S/S 127357 JITENGE VILLAGE	KINANGO	127357	127357 JITENGE VILLA	55	42
60	J22122016100061	LAST MILE S/S 126449 MWANDIMU VILLAGE	KINANGO	126449	126449 MWANDIMU VILL	42	18
61	J22122016100079	LAST MILE S/S 107291 MTULU PRY SCH.	KINANGO	107291	107291 MTULU PRY SCH	50	33
62	J22712016060081	LAST MILE MAX. S/S 112539 CHIGOMBERO VILLAGE L/LUNGA KWALE	MSAMBWENI	112539	112539 CHIGOMBERO VI	55	18
63	J22712016060089	LAST MILE S/S 103348 MUNJE	MSAMBWENI	103348	103348 MUNJE VILLAGE	43	56

		VILLAGE							
64	J22712016070002	LAST MILE S/S 102377 MAJIMBONIS/HILLS	MATUGA	102377	102377 MAJIMBONIS/HI	43	20		
65	J22712016070030	LAST MILE S/S 102376 LUKORE	MATUGA	102376	102376 LUKORE	43	35		
66	J22712016070032	LAST MILE S/S 102378 MWALUVANGA PRY SCH.	MATUGA	102378	102378 MWALUVANGA PR	41	17		
67	J22712016070044	LAST MILE S/S 102445 KIDONGO VILLAGE	MATUGA	102445	102445 KIDONGO VILLA	45	29		
68	J22712016070056	LAST MILE S/S 103639 MWELE VILLAGE KWALE	MATUGA	103639	103639 MWELE VILLAGE	56	2		
69	J22712016070058	LAST MILE S/S 20035 RAMISI SEC. SCH.	MSAMBWENI	20035	20035 RAMISI SEC. SC	60	3		
70	J22712016070066	LAST MILE S/S 104150 MSHIU MARKET	LUNGALUNGA	104150	104150 MSHIU MARKET	56	42		
71	J22712016070082	LAST MILE S/S 19074 MWERENI	LUNGALUNGA	19074	19074 MWERENI	55	39		
72	J22712016070088	LAST MILE S/S 20754 PETULANI MARKET	MATUGA	20754	20754 PETULANI MARKE	45	24		
73	J22712016090006	LAST MILE S/S 36141 MAGODZONI TIWI	MATUGA	36141	36141 MAGODZONI TIWI	42	18		
74	J22722016060014	LAST MILE S/S 124549 BUMBANI - UKUNDA	MATUGA	124549	124549 BUMBANI - UKU	41	40		
75	J22722016060016	LAST MILE S/S 103541 KINANGO	KINANGO	103541	103541 KINANGO	56	18		
76	J22722016070012	LAST MILE S/S 103543 KINANGO	KINANGO	103543	103543 KINANGO	50	18		

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77	J22722016070014	LAST MILE S/S 20840 GWADU - KINANGO	KINANGO	20840	20840 GWADU - KINANG	59	10
Total Customers						3890	2041

Table 4. Extension and Maximization Site  
Nakuru County

NO.S	SITES	COMMENTS	KV	CORDINATES	CONSTITUENCY	Number of Customers
1	Arahuka pcea	Tx on line	33	X-173516, Y-9983368	Bahati	37
2	Kikobey	Tx on line	33	X-197608, Y-99477715	Gilgil	33
3	Kiambogo	Tx on line	33	x-178420, y-9933306	Gilgil	58
4	Kiambogo	1km HT & TX	33	x-180069, y-9934836	Gilgil	38
5	Karirikania	1km HT & TX	33	X-129406, Y-9960116	Kuresoi north	31
6	Kenjoketty pry	800m HT & TX	33	X-125484, Y-9962971	Kuresoi north	22
7	Koitaba	Tx on line	33	X-122460, Y-9948507	Kuresoi south	40
8	Kamwaura	Tx on line	33	X-121009, Y-9949337	Kuresoi south	31
9	Chemaner	Tx on line	33	X-121405, Y-9951467	Kuresoi south	43
10	Chesirikwa	300m HT & TX	33	X-123437, Y9953572	Kuresoi south	50
11	Kamugora	Tx on line	33	X-117943, Y-9952406	Kuresoi south	25
12	Lakwenda	500m HT & TX	33	X-125476, Y-9957578	Kuresoi south	45
13	Maela	1km HT & TX	11	X-186267, Y-9905305	Naivasha	49
14	New karati	900m HT & TX	33	X-221052, Y-9925707	Naivasha	52

15	North karati	Tx on line	33	X-217207, Y-9924162	Naivasha	47
16	Maraigusho	800m HT & TX	33	X-223633, Y-9916831	Naivasha	27
17	Mwicingiri	Tx on line	33	X-221926, Y-9911849	Naivasha	40
18	Ndabibi	800m HT & TX	11	X-190018, Y-9922803	Naivasha	15
19	Ndabibi	1km HT & TX	11	X-191620, Y-9923342	Naivasha	67
20	Ngondi	800m HT & TX	11	X-188787, Y-9908209	Naivasha	57
21	Kanyanyaini	500m HT & TX	11	X-164889, Y-9946916	Njoro	81
22	Kikapu	950M HT & TX	11	X-163182, Y-9961785	Njoro	11
23	Likia	Tx on line	33	X-163445, Y-9940430	Njoro	67
24	Likia police post	Tx on line	33	X-163967, Y-9940719	Njoro	116
25	Mosop	Tx on line	33	x-164433, y-9940377	Njoro	82
26	Kamasai/mauche	Tx on line	11	X-161330, Y-9944807	Njoro	3
27	Piave	1km HT & TX	11	X-165142, Y-9961936	Njoro	35
28	Sunrise	1km HT & TX	11	X-163480, Y-9961753	Njoro	29
29	Emait/mauche	Tx on line	11	X-165272, Y-9943529	Njoro	63
30	Mogotio	1.1 km HT & TX	11	X-162829, Y-9997359	Rongai	95
31	Mogotio	Tx on line	11	X-161890, Y-9996525	Rongai	14
32	Lawina	Tx on line	33	X-151074, Y-9964385	Rongai	40
33	Kerma	800m HT & TX	11	X-161080, Y-9965528	Rongai	22
34	Kerma	600m HT & TX	11	X-161700, Y-9966422	Rongai	17
35	E/ravine junction	400m HT & TX	33	X-158204, Y-9989860	Rongai	33
36	Kapsetek	600m HT & TX	33	X-151716, Y-9990880	Rongai	18
37	Ngonda B	Tx on line	11	X-153107, Y-9969245	Rongai	17

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	village								
38	Piave	1km HT & TX	11	X-166132, Y-9961668	Rongai			58	
39	Piave	1km HT & TX	11	X-166401, Y-9963962	Rongai			89	
40	Matuiku	900m HT & TX	33	X-149697, Y-9973496	Rongai			28	
41	Lelechwet	Tx on line	33	X-147372, Y-9974785	Rongai			76	
42	Gicheha farm	1.5km HT & TX	11	X-154934, Y-9977086	Rongai			11	
43	Kandutura	400m HT & TX	11	X-144667, Y-9988236	Rongai			56	
44	Kapsetek	700m HT & TX	33	X-151062, Y-9991381	Rongai			25	
45	Kamumo	900m HT & TX	11	X-191778, Y-10004684	Subukia			50	
46	Mihango	Tx on line	33	X-192608, Y-10005966	Subukia			39	
47	Simboyon	900m HT & TX	33	Y-192183, Y-10009106	Subukia			60	
48	Kaptarakwa	Tx on line	33	X-190797, Y-10008552	Subukia			22	
49	Marry land	1.4KM HT & TX	11	X-192655, Y-9999602	Subukia			21	
Total									2,085

Nyandarua County

NO.	SITES	COMMENTS	KV	CORDINATES	CONSTITUENCY	Number of Customers
1	KIRIGONO VILLAGE	Tx on line	11	X-192455.307,Y-9966635.314	OLKALOU	25
2	MATINDIRI AREA	Tx on line	11	X-197511.325,Y-9979847.271	OLKALOU	22
3	KIRIMANGAI VILLAGE	Tx on line	11	X-205650.314,Y-9984341.242	OLJOROROK	36
4	MURUAI VILLAGE	Tx on line	11	X-216034.294,Y-9986955.213	NDARAGWA	57
5	MBUYU VILLAGE	Tx on line	11	X-223087.309,Y-10002779.157	NDARAGWA	47

6	WARUKIRA JUNCTION	Tx on line	11	X-220517.27, Y-9980747.219	NDARAGWA	64
7	KIHARA VILLAGE	Tx on line	11	X-221492.288, Y-9990562.192	NDARAGWA	38
8	KAHUTHAVILLAGE NO.18	Tx on line	11	X-227709.282, Y-9995298.168	NDARAGWA	118
9	Fredrick Karaja S/N-85258	1km HT & TX	11	X-200120.329, Y-9984515.253	OLJOROROK	16
10	PASSENGA VILLAGE	400M HT & TX	11	X-205656.293, Y-9974409.266	OLKALOU	28
11	KIRATHIMO VILLAGE	980m HT & TX	11	X-196183, Y-9965114	OLKALOU	39
12	THABA VILLAGE	Tx on line	11	X-198929, Y-9968320	OLKALOU	86
13	KWA MATU VILLAGE	Tx on line	33	X-227896.208, Y-9959068.257	KIPIPIRI	64
14	KAMIRANGIVILLAGE II	Tx on line	33	X-224996.19, Y-9946417.291	KIPIPIRI	65
15	BAHATI	Tx on line	33	X-200300.346, Y-9992695.232	OLJOROROK	42
16	KITOGO	Tx on line	33	X-236334.155, Y-9941426.28	KIPIPIRI	130
17	NYAKIO VILLAGE	1km HT & TX	33	X-196730.337, Y-9984762.26	OLJOROROK	47
18	Charagita	1km HT & TX	33	X-197333.335, Y-9984471.26	OLJOROROK	49
19	KANYAWA	1km HT & TX	33	X-237510.12, Y-9924834.313	KINANGOP	54
20	KIAHUHO VILLAGE	1km HT & TX	33	X-235521.126, Y-9925395.316	KINANGOP	110
21	KANYAWA VILLAGE	1km HT & TX	33	X-236536.117, Y-9922136.321	KINANGOP	54
22	RIRONI VILLAGE	1km HT & TX	33	X-220394.237, Y-9964551.259	KIPIPIRI	109
23	MAWINGU VILLAGE	1km HT & TX HT & TX				
24	SATIMA WANJOHI VILLAGE	TX	33	X-221860.63974, Y-9948006.09405	KIPIPIRI	60
25	GITHUNGURI SOWETO	400M HT & TX	33	X-224223.223, Y-9962255.256	KIPIPIRI	50
26	VIIILAGE	400M HT & TX	33	X-224807.219, Y-9960850.259	KIPIPIRI	41
27	KAMIRANGI VILLAGE	400M HT & TX	33	X-225861.19, Y-9947452.287	KIPIPIRI	85
28	KAMUKUNJI	420M HT & TX	33	X-199544.348, Y-9992628.234	OLJOROROK	64

28	KARIKO BVILLAGE	600M HT & TX	33	X-195365.34,Y-9984580.264	OLJOROOROK	44
29	KARIAHU VILLAGE	600M HT & TX	33	X-236742.122,Y-9924732.315	KINANGOP	33
30	Tabitha Wangui& OTHERS	860M HT & TX	33	X-223251.196,Y-9947570.292	KIPIPIRI	51
31	NYAIROKO PASSENGA	965M HT & TX	33	X-200845.319,Y-9980986.261	OLKALOU	35
32	CHURIRI VILLAGE	Tx on line	33	X-238137,Y-9917137	KINANGOP	58
33	IGANJO VILLAGE	860M HT & TX	33	X-234611,9938400	KIPIPIRI	43
34	KITIRI VILLAGE	1km HT & TX	33	X-234224,Y-9936931	KIPIPIRI	43
35	MAI MAHORO	1km HT & TX	33	X-234163,Y-9936415	KIPIPIRI	35
TOTAL						1,942

Kilifi County

NO.	SITE -NAME	KV	COORDINATES - X	COORDINATES - Y	CONSTITUENCY	Number of Customers
1	MKINGIRINI PRIMARY ENV.	33	592780	9604641	KILIFI NORTH	66
2	NGOLOKO VILLAGE	33	587940	9571449	KILIFI SOUTH	125
3	SHARIANI MAJENGO MAPYA	11	590876	9581577	KILIFI SOUTH	49
4	KWA ABEID MWARAKAYA	33	576711	9579012	KALOLENI	54
5	KATIKIRIENYI VILLAGE-CHONYI	33	577996	9585051	KALOLENI	90
6	KWA CHIKOLOLO VILLAGE MARIAKANI	11	556264	9571496	RABAI	82
7	MKWAJUNI VILLAGE MARIAKANI	11	554449	9572384	RABAI	92
8	MSHONGOLENI JUNCTION	33	617228	9641840	MALINDI	85
9	GANDA FURUNZI	33	620884	9644269	MALINDI	115

10	MAMBRUI	33	627668	9654670	MAGARINI	39
11	MITSUFINI VILLAGE	33	588041	9634885	GANZE	40
12	MWEZAMOYO -BAMBA	33	556636	9609612	GANZE	89
13	KITUONI TEZO	33	595573	9608181	KILIFI NORTH	37
14	TAKAUNGU VUMA/KAYANDA VILAGE	33	594270	9590710	KILIFI SOUTH	17
						980

Kwale County

NO	SITES	KV	COORDINATES - X	COORDINATES - Y	CONSTITUENCY	Number of Customers
1	Kwale Tumaini Academy	11	551692	9538650	Matuga	96
2	Samburu Kinagoni stage	33	528761	9580303	Kinango	55
3	Kibiboni	11	542582	9499650	Lunga Lunga	24
4	Mkono wa Ndugu	11	538852	9498543	Msambweni	73
5	Nikaphu village	33	542394	9502605	Lunga Lunga	41
6	majoreni before airtel tower	11	536853	9499020	Msambweni	30
7	Kiteje Bombo village	11	567146	9544045	Matuga	81
8	Gulanze Nganja village	11	521718	9536938	Kinango	31
9	Shimoni Mwazaro village	11	543045	9491884	Msambweni	37
10	Shimoni Mwazaro village	11	542985	9491624	Msambweni	19
11	Mvindeni ratinga village	33	561907	9523267	Msambweni	76
Total						563

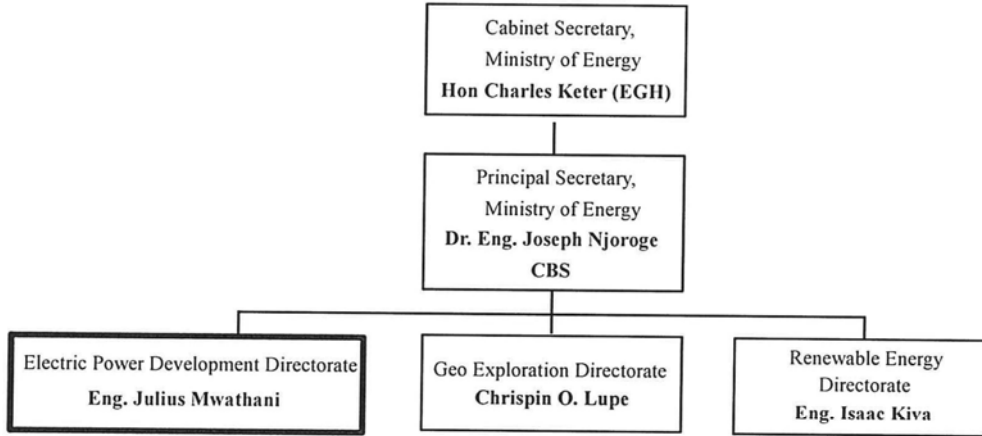


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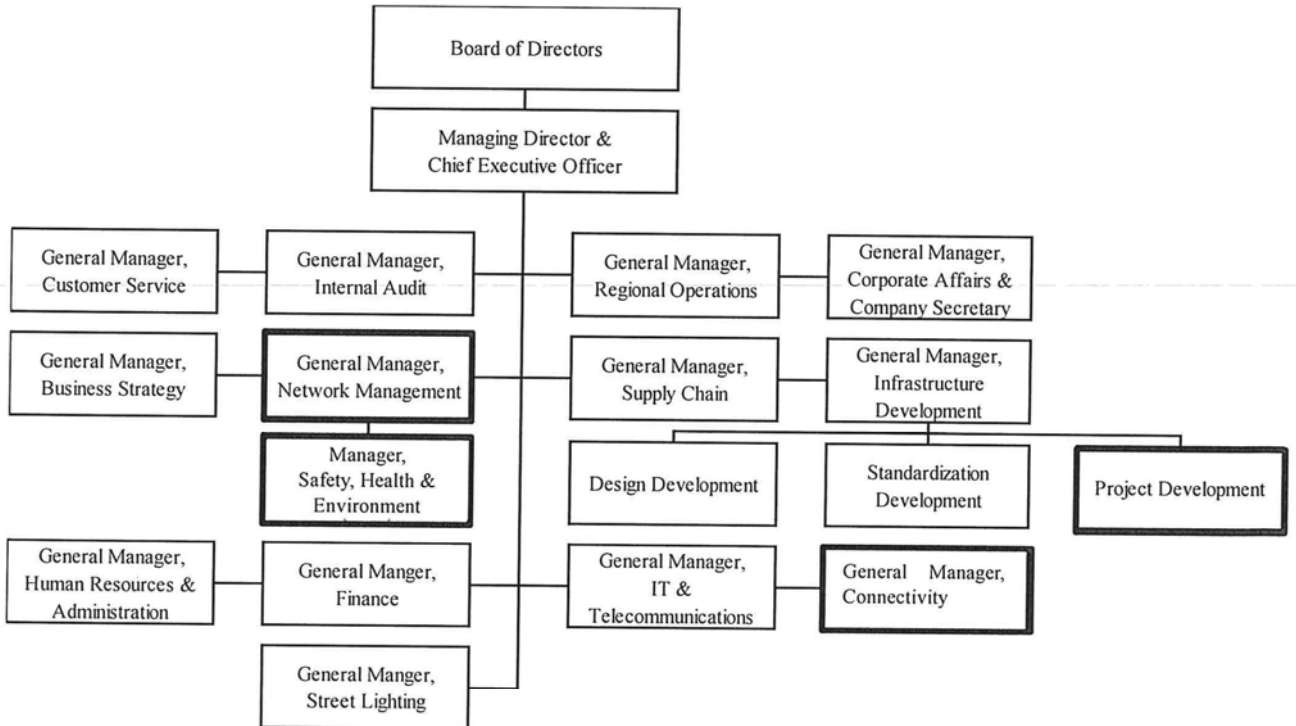


【Annex 4 Organization charts (MoE and Kenya Power)】

Organization Chart of Ministry of Energy



Organization Chart of Kenya Power



【Annex 5 Item list and prospective suppliers】

(Initial Request)

No.	Item	Supplier		
		From Local	From Japan or Japanese Brand	From Third Country
1	<b>10mm2 PVC Insulated Single Phase Concentric Aluminium Cable</b>	✓	-	-
2	Conductor 50mm2 AA hd bare	✓	-	-
3	<b>Cutout Service IP+N 60/80A(Double)</b>	✓	-	-
4	LV Wooden Pole Fitting	✓	-	-
5	LV Concrete Pole Fitting	✓	-	-
6	MV Wooden Pole Fittings	✓	-	-
7	MV Concrete Pole Fittings	✓	-	-
8	<b>Service Cable Wooden fittings</b>	✓	-	-
9	<b>Service Cable Concrete fittings</b>	✓	-	-
10	Pole Wood Treated 10.0m	✓	-	-
11	Pole Concrete 10.0m	✓	-	-
12	Pole Wood Treated 11.0m	✓	-	-
13	Pole Concrete 11.0m	✓	-	-
14	Pole Wood Treated 12.0m	✓	-	-
15	Pole Concrete 12.0m	✓	-	-
16	PME (Protective Multiple Earthing)	✓	-	-
17	Transformer 50kVA 33/.433kV (Low-loss type)	-	✓	-
18	Transformer 50kVA 11/.433kV (Low-loss type)	-	✓	-
19	Transformer 25kVA 33/.240kV (Low-loss type)	-	✓	-
20	Transformer 25kVA 11/.240kV (Low-loss type)	-	✓	-
21	75sqmm ACSR Conductor	✓	-	-
22	H-Pole Wooden Structures 33kV 50kva	✓	-	-
23	H-Pole Concrete Structures 33kV 50kva	✓	-	-
24	H-Pole Wooden Structures 11kV 50kva	✓	-	-
25	H-Pole Concrete Structures 11kV 50kva	✓	-	-
26	H-Pole Wooden Structures 33kV 25kva	✓	-	-
27	H-Pole Concrete Structures 33kV 25kva	✓	-	-
28	Single-Pole Wooden Structures 11kV 25kVA	✓	-	-
29	Single-Pole Concrete Structures 11kV 25kVA	✓	-	-
30	11kV Normal Stay Wooden	✓	-	-
31	11kV Normal Stay Concrete	✓	-	-
32	33kV Normal Stay Wooden	✓	-	-
33	33kV Normal Stay Concrete	✓	-	-
34	11kV Flying Stay Wooden	✓	-	-
35	11kV Flying Stay Concrete	✓	-	-
36	33kV Flying Stay Wooden	✓	-	-
37	33kV Flying Stay Concrete	✓	-	-
38	MV Earthing	✓	-	-
39	Substation Leads	✓	-	-
40	Substation Secondary Conductor 50mm2 AA sd PVC	✓	-	-

(Amendment)

No.	Item	Supplier		
		From Local	From Japan or Japanese Brand	From Third Country
1	Conductor 50mm2 AA hd bare	✓	-	-
2	LV Wooden Pole Fitting	✓	-	-
3	LV Concrete Pole Fitting	✓	-	-
4	MV Wooden Pole Fittings	✓	-	-
5	MV Concrete Pole Fittings	✓	-	-
6	Pole Wood Treated 10.0m	✓	-	-
7	Pole Concrete 10.0m	✓	-	-
8	Pole Wood Treated 11.0m	✓	-	-
9	Pole Concrete 11.0m	✓	-	-
10	Pole Wood Treated 12.0m	✓	-	-
11	Pole Concrete 12.0m	✓	-	-
12	PME (Protective Multiple Earthing)	✓	-	-
13	Transformer 50kVA 33/.433kV (Low-loss type)	-	✓	-
14	Transformer 50kVA 11/.433kV (Low-loss type)	-	✓	-
15	Transformer 25kVA 33/.240kV (Low-loss type)	-	✓	-
16	Transformer 25kVA 11/.240kV (Low-loss type)	-	✓	-
17	75sqmm ACSR Conductor	✓	-	-
18	H-Pole Wooden Structures 33kV 50kva	✓	-	-
19	H-Pole Concrete Structures 33kV 50kva	✓	-	-
20	H-Pole Wooden Structures 11kV 50kva	✓	-	-


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21	H-Pole Concrete Structures 11kV 50kva	✓	-	-
22	H-Pole Wooden Structures 33kV 25kva	✓	-	-
23	H-Pole Concrete Structures 33kV 25kva	✓	-	-
24	Single-Pole Wooden Structures 11kV 25kVA	✓	-	-
25	Single-Pole Concrete Structures 11kV 25kVA	✓	-	-
26	11kV Normal Stay Wooden	✓	-	-
27	11kV Normal Stay Concrete	✓	-	-
28	33kV Normal Stay Wooden	✓	-	-
29	33kV Normal Stay Concrete	✓	-	-
30	11kV Flying Stay Wooden	✓	-	-
31	11kV Flying Stay Concrete	✓	-	-
32	33kV Flying Stay Wooden	✓	-	-
33	33kV Flying Stay Concrete	✓	-	-
34	MV Earthing	✓	-	-
35	Substation Leads	✓	-	-
36	Substation Secondary Conductor 50mm <sup>2</sup> AA sd PVC	✓	-	-

Note: Insulators, Fuses which are component of fittings to be procured from Japan or Third Country.



【Annex 6 Explanation of Japanese Grant】

**JAPANESE GRANT**

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as “the Recipient”) to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as “Project Grants”).

**1. Procedures of Project Grants**

Project Grants are conducted through following procedures (See “PROCEDURES OF JAPANESE GRANT” for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as “the Survey”) conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as “GOJ”) and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as “the G/A”)

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as “the B/A”)

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as “the Bank”) to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as “the Project”) on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

**2. Preparatory Survey**

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the Project made by the

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GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the Recipient necessary for the implementation of the Project.
- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

#### (2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

#### (3) Result of the Survey


JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

### 3. Basic Principles of Project Grants

#### (1) Implementation Stage

##### 1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as “the



E/N”) will be signed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the “General Terms and Conditions for Japanese Grant (January 2016).”

2) Banking Arrangements (B/A) (See “Financial Flow of Japanese Grant (A/P Type)” for details)

- a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.
- b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA’s procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project’s implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to “Japanese nationals”, in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA

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about its status by using the Project Monitoring Report (PMR).

#### 8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

#### 9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed of the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

- a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.
- b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

#### (2) Ex-post Monitoring and Evaluation Stage

- 1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.
- 2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.


#### (3) Others

##### 1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

##### 2) Major undertakings to be taken by the Government of the Recipient





For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

【Annex 7 Project Implementation Schedule】

Year	2019												2020												2021		
	Month	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		
Tendering works	Consultant contract	▲																									
	Review of Equipment specification		▬																								
	Preparation of Tender Document		▬																								
	Approval of tender document			▬																							
	Tender announcement				▲																						
	Tender																										
Procurement of Equipment	Tender Evaluation						▬																				
	Contractor Contract																										
Procurement works	- Design																										
	- Manufacturing																										
	- Factory inspection, sea and inland transportation																										
	Construction of facilities																										
	Nakuru/Nyandarua County																										
	(1) Route survey																										
	(2) Construction of Wooden Poles																										
	(3) Construction of Concrete Poles																										
	(4) Construction of Distribution line																										
	(5) Installation of Transformer																										
	Kilifi/Kwale County																										
	(1) Route survey																										
	(2) Construction of Wooden Poles																										
	(3) Construction of Concrete Poles																										
	(4) Construction of Distribution line																										
(5) Installation of Transformer																											
- Inspection and Taking over																											

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**【Annex 8 Major undertakings to be taken by the Government of Kenya】**

**1. Specific obligations of the Government of Kenya which will not be funded with the Grant**

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To implement stakeholder meeting	Before the G/A	SHE Department (KPLC)		Finished
2	To open Bank Account (B/A)	within 1 month after the signing of the G/A	National Treasury		
3	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract	National Treasury		
4	To obtain approval for Environmental Screening from NEMA	within 1 month after the signing of the G/A	SHE Department (KPLC)	5740 USD	
5	To secure the necessary budget for compensation for Land , Structures,Crops, Trees	before notice of the bidding document(s)	EP Directorate (MoE)	Nil	
6	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	till land compensation and resettlement complete	Projects Department (KPLC)	5740 USD	
7	To secure and clear the project sites	before notice of the bidding document(s)	Projects Department (KPLC)		
8	To obtain the planning, zoning, and building permit	before notice of the bidding document(s)	Projects Department (KPLC)	N/A	
9	To submit Project Monitoring Report	before preparation of bidding document(s)	Projects Department (KPLC)		

Note: B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable, SHE : Safety ,Health & Environment, EP: Electric Power

xx shall be fixed in Draft Preparatory Survey Report.

## (2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)	Projects Department (KPLC)		
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A		Projects Department (KPLC)		
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	Projects Department (KPLC)		
	2) Payment commission for A/P	every payment	Projects Department (KPLC)		
3	To ensure prompt unloading and customs clearance at ports of disembarkation in the country of the Recipient and to assist the Supplier(s) with internal transportation therein	during the Project	Projects Department (KPLC)		
	To ensure prompt customs clearance and to assist the Supplier(s) with internal transportation in the country of the Recipient	during the Project	Projects Department (KPLC)		
4	To accord Japanese physical persons and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project	Projects Department (KPLC)		
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and the services are exempted	during the Project	Projects Department (KPLC)		
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	Projects Department (KPLC)		
7	1) To submit Project Monitoring Report after each work under the contract(s) such as shipping, hand over, installation and operational training	within one month after completion of each work	Projects Department (KPLC)		
	2) To submit Project Monitoring Report (final)	within one month after signing of Certificate of Completion for the works under the contract(s)	Projects Department (KPLC)		
8	To submit a report concerning completion of the Project	within six months after completion of the Project	Projects Department (KPLC)		
9	To implement EMP and EMoP	during the construction	Projects Department (KPLC)		
10	To submit results of environmental monitoring to JICA, by using the monitoring form, on a quarterly basis as a	during the construction	Projects Department (KPLC)		

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	part of Project Monitoring Report				
11	To implement RAP (livelihood restoration program, if needed)	for a period based on livelihood restoration program	Projects Department (KPLC)		
12	To implement connection construction for the end users	during implementation and within 3 years after Project completion	Connectivity Department (KPLC)	xx.KSh	

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To implement EMP and EMoP	for a period based on EMP and EMoP	SHE Department (KPLC)		
2	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between Kenya Power and JICA.	for three years after the Project	SHE Department (KPLC)		
3	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure Routine check/Periodic inspection	After completion of the construction	NWM Department (KPLC)	20.4 million KSh/year	

Note: NWM: Network Management

【Annex 9 Project Monitoring Report (template)】

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<p><b><u>Project Monitoring Report</u></b>  on  <b><u>Project Name</u></b>  <b>Grant Agreement No. <u>XXXXXXXX</u></b>  20XX, Month</p>
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**Organizational Information**

<b>Signer of the G/A (Recipient)</b>	<hr/> Person in Charge (Designation) _____ <hr/> Contacts            Address: _____ Phone/FAX: _____ Email: _____
<b>Executing Agency</b>	<hr/> Person in Charge (Designation) _____ <hr/> Contacts            Address: _____ Phone/FAX: _____ Email: _____
<b>Line Ministry</b>	<hr/> Person in Charge (Designation) _____ <hr/> Contacts            Address: _____ Phone/FAX: _____ Email: _____

**General Information:**

<b>Project Title</b>	
<b>E/N</b>	Signed date: Duration:
<b>G/A</b>	Signed date: Duration:
<b>Source of Finance</b>	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

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**1: Project Description**

**1-1 Project Objective**

[Empty box for Project Objective]

**1-2 Project Rationale**

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

[Empty box for Project Rationale]

**1-3 Indicators for measurement of "Effectiveness"**

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr )	Target (Yr )
Qualitative indicators to measure the attainment of project objectives		

**2: Details of the Project**

**2-1 Location**

Components	Original <i>(proposed in the outline design)</i>	Actual
1.		

**2-2 Scope of the work**

Components	Original* <i>(proposed in the outline design)</i>	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

**2-3 Implementation Schedule**

Items	Original		Actual
	<i>(proposed in the outline design)</i>	<i>(at the time of signing the Grant Agreement)</i>	

Reasons for any changes of the schedule, and their effects on the project (if any)

**2-4 Obligations by the Recipient**

**2-4-1 Progress of Specific Obligations**

See Attachment 2.

**2-4-2 Activities**

See Attachment 3.

**2-4-3 Report on RD**

See Attachment 11.

**2-5 Project Cost**

**2-5-1 Cost borne by the Grant (Confidential until the Bidding)**

Components			Cost (Million Yen)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original <sup>1),2)</sup> <i>(proposed in the outline design)</i>	Actual
	1.			
Total				

Note: 1) Date of estimation:  
 2) Exchange rate: 1 US Dollar = Yen



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**2-5-2 Cost borne by the Recipient**

Components			Cost (1,000 Taka)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original <sup>1),2)</sup> <i>(proposed in the outline design)</i>	Actual
	1.			

Note: 1) Date of estimation:  
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

**2-6 Executing Agency**

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

<p><b>Original</b> <i>(at the time of outline design)</i></p> <p>name:</p> <p>role:</p> <p>financial situation:</p> <p>institutional and organizational arrangement (organogram):</p> <p>human resources (number and ability of staff):</p>
<p><b>Actual</b> (PMR)</p>

**2-7 Environmental and Social Impacts**

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

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**3: Operation and Maintenance (O&M)**

- 3-1 **Physical Arrangement**  
 - Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

<b>Original</b> (at the time of outline design)
<b>Actual</b> (PMR)

- 3-2 **Budgetary Arrangement**  
 - Required O&M cost and actual budget allocation for O&M

<b>Original</b> (at the time of outline design)
<b>Actual</b> (PMR)

**4: Potential Risks and Mitigation Measures**

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

**Assessment of Potential Risks** (at the time of outline design)

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:

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	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
<b>Actual Situation and Countermeasures</b>	
(PMR)	

**5: Evaluation and Monitoring Plan (after the work completion)**

**5-1 Overall evaluation**

Please describe your overall evaluation on the project.

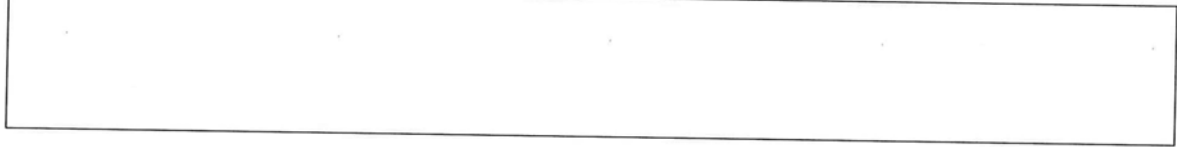
**5-2 Lessons Learnt and Recommendations**

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

**5-3 Monitoring Plan of the Indicators for Post-Evaluation**

Please describe monitoring methods, section(s)/department(s) in charge of monitoring,

frequency, the term to monitor the indicators stipulated in 1-3.



#### Attachment

1. Project Location Map
  2. Specific obligations of the Recipient which will not be funded with the Grant
  3. Monthly Report submitted by the Consultant
- Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
  - Contractor's Main Staff List
4. Check list for the Contract (including Record of Amendment of the Contract/ Agreement and Schedule of Payment)
  5. Environmental Monitoring Form / Social Monitoring Form
  6. Monitoring sheet on price of specified materials (Quarterly)
  7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final) only)
  8. Pictures (by JPEG style by CD-R) (PMR (final) only)
  9. Equipment List (PMR (final) only)
  10. Drawing (PMR (final) only)
  11. Report on RD (After project)

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A x B	1% of Contract Price D	Condition of payment Price	
					(Decreased) E=C-D	(Increased) F=C+D
Item 1	●●t	●	●	●	●	●
Item 2	●●t	●	●	●		
Item 3						
Item 4						
Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

Items of Specified Materials	1st month, 2015		2nd month, 2015		3rd month, 2015		4th		5th		6th	
	Item 1	●		●		●						
Item 2												
Item 3												
Item 4												
Item 5												

(3) Summary of Discussion with Contractor (if necessary)

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)  
 (Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

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**【Annex 10 Environmental Check List】**

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	<p>(a) Have EIA reports been already prepared in official process?</p> <p>(b) Have EIA reports been approved by authorities of the host country's government?</p> <p>(c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?</p> <p>(d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?</p>	<p>N</p> <p>N</p> <p>N</p> <p>N</p>	<p>-According to the JICA Guidelines for Environmental and Social Considerations (2010.4), the project was classified as "Category B", which is required an IEE level study. Thus, JICA study Team is carrying out an IEE level study and prepare IEE reports.</p> <p>-Separately, KPLC will conduct Environmental Screening of the Project to get Clearance Letter from NEMA.</p> <p>-According to KPLC, Environmental Screening has been done for different phases of the LMCP and got environmental approval as Clearance Letters from NEMA.</p> <p>-Regarding the environmental approval of the Project, KPLC will conduct Environmental Screening of the Project to get Clearance Letter from NEMA as an evidence of environmental approval and submit a copy of the Letter to JICA Study Team before Grant Aid Agreement (March of 2019).</p> <p>According to Clearance Letters form NEMA, it is not known whether some conditions were imposed or not. Copies of Clearance Letters will be submitted to the Study Team.</p> <p>-Permission of wayleaves acquisition for affected subjects in public spaces such as roads from such as Road authority.</p> <p>-Permission of construction from relevant organizations such as County/ Constituency government should be obtained before provision of electric facilities or commencement of installation work.</p>
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on	Y	Stakeholder meetings (SHMs) for information disclosure and public participation, hosted by KPLC were held in two places for each County from October 29 <sup>th</sup> to November 1 <sup>st</sup> 2018. Number of local people and anticipated PAPs are 131, 164, 119 and 145 persons for Nakuru, Nyandarua, Kilifi and Kwale County, respectively. Project plan and the potential impacts were adequately explained to the local stakeholders at the SHMs. It was recognized that people were eagerly requesting more and earlier power connection.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders?		
	(b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?		Y	Comments from stakeholders will be reflected to the project design.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	Y	<ul style="list-style-type: none"> <li>-Alternative energy use plans were examined with usage of kerosene, diesel generator, batteries etc. as well as the case of without the project.</li> <li>-Alternative routes and locations of distribution lines were also examined in terms of demand of electricity, poverty condition, ratio of power connection, etc.</li> </ul>
2 Pollution Control	(1) Water Quality	(a) Is there any possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? If the water quality degradation is anticipated, are adequate measures considered?	N	Earthmoving activities will be undertaken mostly in flat and small area with a circle of about 1m diameter for erecting poles. In addition, soil will be back-filled in same place, if not wasted, or delivered to storage sites of KPLC. Thus, soil runoff is hardly anticipated.
3 Natural	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international	N	The project site is located neither in protected areas nor in environmentally sensitive areas. Thus, no negative impact is expected due to the project.



Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		treaties and conventions? Is there a possibility that the project will affect the protected areas?		
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	N	The project site does not encompass areas such as primeval forests, tropical rain forests, ecologically valuable habitats.
		(b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	N	The project site does not encompass areas such as primeval forests, tropical rain forests, ecologically valuable habitats.
		(c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	N	The project activities are installation and operation of transformers and poles through lower voltage line to connect electricity to users. Thus, adverse impacts due to activities such as a large amount of pollutant emission and change in natural habitat and deforestation are not anticipated.
		(d) Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife and livestock?	N	The project activities are installation and operation of transformers and poles through lower voltage line to connect electricity to users. Thus, adverse impacts due to activities such as disruption of migration routes and habitat fragmentation of wildlife and livestock are not anticipated.
		(e) Is there any possibility that the project will cause	N	The project activities are installation and operation of transformers and poles through lower voltage line to connect electricity to users. Thus, adverse impacts due to activities such as destruction of forest,

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		<p>the negative impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered?</p>		<p>poaching, desertification, reduction in wetland areas, and disturbance of ecosystem due to introduction of exotic (non-native invasive) species and pests are hardly anticipated.</p>
		<p>(f) In cases where the project site is located in undeveloped areas, is there any possibility that the new development will result in extensive loss of natural environments?</p>	N	<p>The project sites are not located in undeveloped areas.</p>
	(3) Topography and Geology	<p>(a) Is there any soft ground on the route of power transmission and distribution lines that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed?</p> <p>(b) Is there any possibility that civil works, such as cutting and filling will cause slope failures or</p>	N	<p>During facility designing routes and places with soft ground will be avoided. Thus, slope failures or landslides are hardly anticipated.</p> <p>Civil works such as cutting and filling are mostly undertaken in flat areas within a circle of about 1m diameter for erecting poles. Thus, slope failures or landslides are hardly anticipated.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		landslides? Are adequate measures considered to prevent slope failures or landslides?		
		(c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	N	Civil works such as cutting and filling are mostly undertaken in flat and small area with a circle of about 1m diameter for erecting poles. In addition, soil will be back-filled in same place, if not wasted, or delivered to storage sites of KPLC. Thus, soil runoff is hardly anticipated.
(1) Resettlement		(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?	Y	Installation of transformers and poles will be mostly within right-of-way and a small space. Thus, neither land acquisition nor resettlement is expected. However, wayleaves and cutting trees and crops as well as destruction of structures are somewhat anticipated. But end-users will enjoy more beneficiaries than wayleaves damage due to electricity connection. Therefore, the compensation is not necessary by the KPLC policy.
4 Social Environment		(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?	Y	Stakeholder meetings have been done in Nakuru, Nyandarua, Kilifi and Kwale County from October 29th to November 1st 2018. Further explanation will be done by KPLC prior to provision of electric facilities.
		(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?	Y	(c) Compensation for wayleaves will not be necessary according to KPLC policy.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		(d) Are the compensations going to be paid prior to the resettlement?	Y	There will be no resettlement.
		(e) Are the compensation policies prepared in document?	Y	Compensation for wayleaves will not be necessary according to KPPLC policy.
		(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?	Y	Resettlement is not anticipated. In an unlikely event that it is necessary, the plan will pay particular attention to vulnerable groups or people.
		(g) Are agreements with the affected people obtained prior to resettlement?	Y	Agreements with PAPs will be obtained prior to resettlement, if any.
		(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	Y	Safety, Health and Environment Department of KPPLC will implement compensation/resettlement. In addition, capacity and budget will be secured by KPPLC.
		(i) Are any plans developed to monitor the impacts of resettlement?	Y	Monitoring plans to follow the impacts of resettlement will be developed.
		(j) Is the grievance redress mechanism established?	Y	The grievance mechanism will be established by KPPLC.

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Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(2) Living and Livelihood	<p>(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>(b) Is there a possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?</p> <p>(c) Is there any possibility that installation of structures, such as power line towers will cause a radio interference? If any significant radio interference is anticipated, are adequate measures considered?</p> <p>(d) Are the compensations for transmission wires given in accordance with the domestic law?</p>	Y	<p>During construction stage there is a possibility to cause inconvenience to local traffic condition due to traffic of construction vehicles and trucks delivering replaced equipment and device.</p> <p>(i) Installation work will be conducted in a small scale and If workers engaging installation work are migrating from other places and staying in the project area during construction work, there is a possibility of developing HIV/AIDS and other infectious diseases due to contact with women. (ii) Enlighten workers and community people to know measures to avoiding and protecting against HIV/AIDS and other infectious diseases. (iii) Grasp present situation of HIV/AIDS and infectious diseases including HIV/AIDS and monitoring, if necessary.</p>
			Y	<p>Height of low voltage distribution line is less than 3m. Thus, a radio interference is not expected.</p>
			Y	<p>Compensation for wayleaves will not be necessary according to KPLC policy.</p>
	(3) Heritage	(a) Is there a possibility that the project will damage	N	<p>No cultural, religious and historical heritage sites were found in or nearby the sites. Thus, negative impact is not anticipated.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?		
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	N	Civil works such as cutting and filling are mostly undertaken in flat areas in small area with a circle of about 1m diameter for erecting poles. In addition, soil will be back-filled in same place, if not wasted, or delivered to storage sites of KPLC. Thus, soil runoff is hardly anticipated.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	Y	At present, there is found no situation for necessary considerations with the poor and vulnerable peoples such as ethnic minorities in the communities of the project area. However, if proper care and management by local government and relevant organization are not given to them, discontent and some conflict may give rise.
		(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for	Y	All of the rights of ethnic minorities and indigenous peoples in relation to land and resources will be respected by KPLC.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for	Y	Measures to abide Law on labor and the proposed Law on Occupational Health and Safety will be incorporated into the EMP and to be monitored in the construction work
			Y	Following tangible considerations will be incorporated in EMP and Environmental Monitoring Plan (EMoP): (i) Any worker and personnel who enter into construction sites have to wear safety shoes and

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		<p>individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?</p> <p>(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?</p>	Y	<p>hats for construction works. (ii) Site manager of the contractor must conduct morning assembly every day by collecting all the labourers and give instructions to them on safety control of construction site and thoroughly conduct safety management of the site. (iii) In the construction site where heavy machines for construction are operated, intrusiveness except concerned parties should be banned. (iv) Consider safety handling and storage in airtight containers of hazardous and dangerous materials.</p> <p>Preparation of environmental and safety management plan and conducting education of traffic safety and public and occupational health to workers and staff. (d) Proper management and education of guards and/or relevant personnel not to infringe safety and security of residents and staff and workers.</p>
		<p>(d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?</p>	Y	<p>In the project plan measures to control security guards not to violate safety of project site and residents, is incorporated, if any.</p>
5. Others	(1) Impacts during Construction	<p>(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p>	Y	<p>Following measures will be incorporated into EMP and to be monitored in the installation work.</p> <p>(1) Air pollution: (i) Use construction machines and vehicles equipped with good exhaust emission system and filled with good quality fuel and oil. (ii) Enlightenment and education of construction workers for prevention or minimize air pollutants generation. (iii) Monitor air pollutants emission and ambient air quality, if necessary.</p> <p>(2) Water pollution: (i) Proper treatment of water pollutants generated from construction work. 2) Surface run-off from the construction site shall be directed to silt traps or sedimentation basin before reuse or discharge with help of channels.</p>

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Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
				<p>(3) Soil contamination: (i) To keep clean storage sites of construction equipment, (ii) To install storage tank for preventing spill and leakage of lubricating oil and asphalt emulsifier etc. (iii) Training of workers for proper handling of toxic materials.</p> <p>(4) Noise pollution: (i) Working during sensitive hours and locating construction machines close to sensitive receptors shall be avoided. (ii) Use equipment with low-noise and vibration. (iii) Installation of soundproof walls/acoustic enclosures and provision of buffer zones.</p> <p>(5) Waste: (i) Consider ways to minimize waste generation in the rehabilitation work plan. (ii) Enlightenment and education of rehabilitation workers for waste management based on 3R principle (reduce, reuse, recycle). (iii) Solid waste generated will be carried out by proper segregation, collection, treatment, reuse and recycle. (iv) Hazardous waste will be transferred to designated dumping site for final disposal. (v) Hazardous waste contained in a small amount of mercury, lead, asbestos will be segregated, transferred and stored in sealed containers installed designated facilities within or near the site.</p>
		(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?	Y	No valuable natural environment (ecosystem) is distributed in surrounding areas Thus, no negative impact is anticipated due to the project.
		(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	Y	To avoid or minimize traffic disturbance and nuisance to local people and communities, following measures will be conducted: 1) Prior to construction work, inform contents of the construction work and schedule, 2) Time shift of construction work. 3) Education of traffic safety and manner to construction workers and drivers, 4) Raise the traffic signal and arrange watchmen on approach road. 5) Equip sheet cover to prevent scattering dust from the bed of truck. 6) Setting staff in charge of complaints.
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?	Y	In the project plan environmental monitoring program is incorporated in the project plan.

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Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		<p>(b) What are the items, methods and frequencies of the monitoring program?</p> <p>(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	Y	<p>In the EMoP, items relating to expected negative impacts as well as necessary permissions are selected and indicator, methods and frequencies as well as responsible institutions are described.</p> <p>In the EIA Procedures NEMA is responsible for implementing the project monitoring. However, to date institutional arrangement of the monitoring framework including budget has not been established yet in NEMA</p> <p>Thus, an in the Project plan the monitoring will be implemented under adequate monitoring framework under the consultation with NEMA and/ or referring to the JICA Guidelines by KPLC itself.</p>
	(1) Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Road checklist should also be checked (e.g., projects including installation of electric transmission lines and/or electric distribution facilities).	N	<p>According to the EMP and EMoP of the project, environmental monitoring will be carried out to comply with both Kenyan legislations and the JICA Guidelines. In the implementation if there will be uncertainty, consult with NEMA and other related organizations to obtain their instruction.</p> <p>Not necessary.</p>
6 Note	(2) Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed, (e.g., the project includes	N	<p>Not necessary.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).		

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**【Annex 11 Environmental Monitoring Plan】**

Category	Method of Monitoring/ Parameter to be monitored	Monitoring Place/Point	Frequency (Period)	Implementation organization	Responsible and/or supervising org.	Cost (KES)
<b>(I) Planning Stage/Pre-Construction Stage</b>						
Environment approval/ permission for the project implementation	(1) To get approval from NEMA	NEMA, KPLC	Before commencement of construction work	KPLC	NEMA, MOE	Within KPLC budget
	(2) Other permit/ approval such as construction permit from local government, if necessary	Construction site			MOE, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc)	
Preparation of EMP and EHS-MP by Contractor	(1) Document of EMP and EHS-EMP by Contractor	Contractor	Before commencement of Construction work	Contractor	KPLC	To be included in the Construction cost of Contractor
<b>(1) Social Environment</b>						
Wayleaves compensation (if required by PAPs)	(1) Record of compensation payment to PAPs, (2) Complaint from PAPs	KPLC (Wayleaves Section, Finance Section), PAPs	Before commencement of construction work	KPLC	MOE, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	KPLC budget
<b>(II) Construction Stage</b>						
<b>(1) Social Environment</b>						
Water use	Water use for installation work may compete with community water	Complaints to water use from people in the	Daily at construction sites and the vicinity	Contractor	MOE, NEMA, Local authorities (Local	To be included in the

Category	Method of Monitoring/ Parameter to be monitored	Monitoring Place/Point	Frequency (Period)	Implementation organization	Responsible and/or supervising org.	Cost (KES)
	supply.	vicinity				
Existing social infrastructures and services	Physical observation and complaints from people in the vicinity	Visual observation and hearing with residents and road users			government, Ministry of Agriculture, Kenya Forest Service, Road, etc)	Construction cost of Contractor
16) Public health and Sanitation	Report and complaints from people in the vicinity	People in the vicinity				
Infectious diseases such as HIV/AIDS	Report outbreak of infectious disease from people in the vicinity and workers	People in the vicinity and workers				
Working condition including occupational safety	Report and/or complaints from workers (ii) Observation of workers conditions and occupational health, safety and environment, (iii) simple medical check of workers, if necessary	Workers				
Hazard/risk (disaster, security)	Record and report of vandalism, leakage of insulator oil, strong wind, thunderbolt, fire, etc.	Construction site, (ii) Access road to construction site, (iii) Worker's camp				
Accidents	Record and report of traffic accidents, falling of workers, electric shock, etc.					
<b>(2) Natural Environment</b>						

Category	Method of Monitoring/ Parameter to be monitored	Monitoring Place/Point	Frequency (Period)	Implementation organization	Responsible and/or supervising org.	Cost (KES)
Ground water condition	Amount of groundwater used	Construction site and vicinity	Daily at construction sites and the vicinity	Contractor	KPLC, MOE, Local Government, NEMA	To be included in the Construction cost of Contractor
Flora, Fauna, Ecosystem and Biodiversity	(1) Number and extent of damage trees logged and crops removed, (2) Complains from people	Construction site and vicinity				
<b>(3) Environmental Pollution</b>						
Air pollution	Qualitative evaluation by physical observation, (ii) Complains from people in the vicinity and workers	Construction site, access road and vicinity	Daily at construction sites and the vicinity	Contractor	KPLC, MOE, Local Government, NEMA	To be included in the Construction cost of Contractor
Water Pollution	Qualitative evaluation by physical observation, (ii) Complains from people in the vicinity and workers					
Soil contamination	(i) Physical observation, (ii) Record of machine and fuel oil for construction, (iii) Complains from people in the vicinity	(i) Construction site, (ii) Worker's camp, (iii) Storage facility of solid waste				
Solid waste	Record of solid waste management (generation, collection, treatment and disposal), (ii) Complains from people in the vicinity	(i) Construction site, (ii) Worker's camp, (iii) Storage facility of solid waste				
Noise and Vibration	Physical observation, (ii) Complains from people in the vicinity and workers, (iii) Measurement by sound level meter, if necessary.	Construction site, access road and vicinity				
<b>(III) Operation Stage</b>						
<b>(1) Social Environment</b>						

Category	Method of Monitoring/ Parameter to be monitored	Monitoring Place/Point	Frequency (Period)	Implementation organization	Responsible and/or supervising org.	Cost (KES)
Public health and Sanitation	Report and complaints from people in the vicinity	Installed sites and the vicinity	In response to report and complaints	KPLC	MOE, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Infectious diseases such as HIV/AIDS	Report outbreak of infectious disease from people in the vicinity and workers					
Working condition including occupational safety	Report and/or complaints from workers (ii) Observation of workers conditions and occupational health, safety and environment, (iii) simple medical check of workers, if necessary					
Hazard/risk (disaster, security)	Record and report of vandalism, leakage of insulator oil, strong wind, thunderbolt, fire, etc.					
Accidents	Record and report of traffic accidents, falling of workers, electric shock, etc.					
<b>(3) Environmental Pollution</b>						
Water Pollution	(i) Data about material composition of transformer insulator oil, and machine and fuel oil and record of usage, (ii) Physical observation, (iii) Complaint from workers and people in the vicinity (iv) Inspection proper handling and storage situation of solid waste contaminated with hazardous materials in storage containers and facilities.	(i) Construction site and its vicinity, (ii) Hazardous waste storage facility	In response to report and complaints	KPLC	KPLC, MOE, Local Government, NEMA	KPLC budget
Soil contamination						
Solid waste						

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**【Annex 12 Environmental and Social Monitoring Form】**

**(1) Environmental Monitoring Form**

Environmental Monitoring Plan based on JICA Format is shown in Tables below.

**1) Planning Stage**

i) Approval and Permit, Explanation to Stakeholders, EMP Preparation by Contractor, etc.

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Environment approval/ permission for the project implementation	(1) To get approval from NEMA	NEMA, KPLC	KPLC	NEMA, MOE	
	(2) Other permit/ approval such as construction permit from local government, if necessary	Construction site	Contractor	KPLC, MOE	
Preparation of EMP and EHS-MP by Contractor	(1) Document of EMP and EHS-MP by Contractor	Contractor	Contractor	KPLC	

**2) Construction Stage**

i) Social Environment

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Water use	Complaints to water use from people in the vicinity	Water use for construction	Contractor	KPLC, MOE, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Traffic congestion and disturbance of access due to construction work	Physical observation and complaints from people in the vicinity	Visual observation and hearing with residents and road users			
Health condition of people in the vicinity	Report and complaints from people in the vicinity	People in the vicinity			



Development infectious diseases such as HIV/AIDS	Report outbreak of infectious disease from people in the vicinity and workers	People in the vicinity and workers			
Occupational health and safety conditions of workers	Report and/or complaints from workers (ii) Observation of workers conditions and occupational health, safety and environment, (iii) simple medical check of workers, if necessary	Workers			
Risk for disaster and public security	Record and report of vandalism, leakage of insulator oil, strong wind, thunderbolt, fire, etc.	Construction site, (ii) Access road to construction site, (iii) Worker's camp			
Accident (traffic accident, falling, electric shock, etc.)	Record and report of traffic accidents, falling of workers, electric shock, etc.				

ii) Natural Environment

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Groundwater use condition	Amount of groundwater used	Construction site and vicinity	Contractor	KPLC, MOE, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Damages of trees and crops due to construction work	(1) Number and extent of damage trees logged and crops removed, (2) Complains from people	Construction site and vicinity			

iii) Environmental Pollution

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Feature of air pollution	Qualitative evaluation by physical observation, (ii) Complaints from people in the vicinity and workers	Construction site, access road and vicinity	Contractor	KPLC, MOE, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Feature of water pollution	Qualitative evaluation by physical observation, (ii) Complaints from people in the vicinity and workers				
Feature of soil contamination	(i) Physical observation, (ii) Record of machine and fuel oil for construction, (iii) Complaints from people in the vicinity	(i) Construction site, (ii) Worker's camp, (iii) Storage facility of solid waste			
Feature of solid waste management	Record of solid waste management (generation, collection, treatment and disposal), (ii) Complaints from people in the vicinity				
Feature of ambient noise and vibration	Physical observation, (ii) Complaints from people in the vicinity and workers, (iii) Measurement by sound level meter, if necessary.	Construction site, access road and vicinity			

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3) Operation Stage

i) Social Environment

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Health condition of people in the vicinity	Report and complaints from people in the vicinity	Installed sites and the vicinity	KPLC	MOE, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Development infectious diseases such as HIV/AIDS	Report outbreak of infectious disease from people in the vicinity and workers				
Occupational health and safety conditions of workers	Report and/or complaints from workers (ii) Observation of workers conditions and occupational health, safety and environment, (iii) simple medical check of workers, if necessary				
Risk for disaster and public security	Record and report of vandalism, leakage of insulator oil, strong wind, thunderbolt, fire, etc.				
Accident (traffic accident, falling, electric shock, etc.)	Record and report of traffic accidents, falling of workers, electric shock, etc.				

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ii) Environmental pollution

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Feature of Water pollution	(i) Data about material composition of transformer insulator oil, and machine and fuel oil and record of usage, (ii) Physical observation, (iii) Complaint from workers and people in the vicinity	(i) Construction site and its vicinity, (ii) Hazardous waste storage facility	KPLC	MOE, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Feature of Soil Contamination					
Feature of solid waste generation, treatment and disposal					

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(2) Social Monitoring Form (Involuntary Resettlement)

Social Monitoring Plan based on JICA Format is shown in Tables below.

i) Consultation with PAPs\*

No.	Date and Time	Place	Contents of Consultation and Response to Comments from PAPs and Response

\*Basically, wayleaves compensation will not be necessary according to KPLC policy. However, the consultation will be necessary, if PAPs request for compensation.

Activity	Expected Number	Unit	Progress (Number of Cases)	Extent of Progress (%)	Date of Completion (Expected)	Responsible Organization
Consultant (KPLC Wayleaves Section)						KPLC
Population Census including socio-economic survey						
Permission of ARAP or Compensation Plan					Date of permission	
Finalization of PAPs list						
Progress of Compensation						
Nakuru County -1		Household				
Nakuru County -2		Household				
Nyandarua County-1		Household				
Nyandarua County-2		Household				
Kilifi County-1		Household				
Kilifi County-2		Household				
Kwale County-1		Household				
Kwale County-2		Household				

ii) Complaints from PAPs

Number of Complaints	Features of Complaints	Measures and Results

iii) Other Issue to be considered

Issue	Contents

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***Appendix-5***

***Environmental and Social Considerations***





Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
<b>(I) Planning Stage/Pre-Construction Stage</b>					
<b>(1) Social Environment</b>					
Land acquisition and resettlement (Involuntary resettlement)	<p>(i) Anticipated activities due to the project are installation work of facilities for distribution lines such as transformers, electric poles wires, etc. during construction stage, and operation and maintenance of the facilities. Necessary space is mostly under air, on the ground and under the ground. In addition, to secure a very small space for erecting electric poles mostly within road reserves. Anticipated involuntary resettlement is Wayleaves Acquisition only, which may cause cutting and/or removal of structures, trees, crops, etc. However, according to the policy of KPLC, end-users agree with KPLC to get no compensation even for damage of property such as trees due to Wayleaves acquisition in advance. The reasons are as follows: (a) The project is as a part of LMCP initiated by the GoK. (b) LMCP may bring about many beneficial impacts on end-users. (iii) Thus, neither land acquisition nor resettlement is expected to occur. (iv) There is a possibility to secure space and/or facilities for temporary storage of construction materials, vehicles and</p>	<p>(i) to (iii) – According to Wayleaves Act and Energy Act, Wayleaves acquisition is allowed for the public purpose. However, it is required to get permission from relevant authorities in advance. (iv) In case that temporary space and/or facilities is required, they will be secured by hiring necessary facilities in the vicinity through rental agreement.</p>	Proponent (KPLC)	MOEn, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	KPLC budget

Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
	machines as well as worker's camp, if site for construction work is apart from warehouse of Regional KPLC office and accommodation for workers is not available.				
<b>(II) Construction Stage</b>					
<b>(1) Social Environment</b>					
Water use	Water use for construction work may compete with community water supply.	Consult with community and/or the village chief to obtain consensus about provision of water with free or in charge.	Contractor	MOEn, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	To be included in Construction Cost by Contractor
Existing social infrastructures and services	(i) Construction work may give rise to temporary traffic congestion and inconvenience for accessibility to social services. (ii) Water use for installation work may compete with community water supply.	(i) To avoid or minimize traffic disturbance and nuisance to local people and communities, following measures will be conducted: (a) Prior to installation work, inform contents of the work and schedule, (b) Time shift of installation work. (c) Education of traffic safety and manner to installation workers and drivers. (ii) Consult with community and/or the village chief to obtain consensus about provision water with free or in charge.			
Public health and Sanitation	There is a possibility of deterioration of public health conditions due to generation of air and water pollutants and soli waste, if pollution control management in construction work is not conducted appropriately.	(i) Preventive measures to control air pollutants emission in construction work. (ii) Monitor public health condition by medical examination.			

Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
Infectious diseases such as HIV/AIDS	In many developing countries spreading of infectious diseases such as HIV/AIDS were often reported due to contact of inflowing workers with affected peoples at their camp in construction work. Thus, it is expected somewhat spreading of infectious diseases during construction stage.	(i) Public awareness of the public health issues identified. (ii) Provision of condoms, (iii) Distribution of HIV/AIDS awareness materials in collaboration with NACC (National Aids Control Council). (iii) Monitoring cases of HIV/AIDS before and after the construction phase. (iv) Enlightenment and campaign of prevention and cure of HIV/AIDS.			
Working condition including occupational safety	Adverse impacts on working condition including occupational safety are expected somewhat due to insufficient management for workers at construction work.	(i) Adequate ladder should be provided. (ii) Provision of climbing shoes. (iii) Provide safety harness. (iv) Use of personal protective equipment like gloves, helmet, climbing shoes, harnesses etc. (iv) Use of signs, barriers and enlightenment to prevent public contact with potentially dangerous equipment. (v) Community policing to be encouraged to reduce vandalism of transformers and distribution cables. (vi) Follow safe work procedures. (vii) Observe OSHA 2007 regulations as well as the Environmental Guidelines for Contractors (EGCT) of KPLC.			
Hazard/risk (disaster, security)	Hazard and risk are anticipated somewhat for following cases: (i) Electric shock and electrocution due to accidental contact with transformers. (ii) Leakage of insulator oil which may include hazardous	(i) Workers should be equipped with safety belts and other safety device. (ii) Create public and staff awareness on the electrical safety rules. (iii) Proper public education to the people on safe use of electricity. (iii) Need to design appropriate protection devices			

Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
	materials due to deterioration of transformers. (iii) Uncontrolled behaviours of workers may rise risk of public security.	against accidental leakage of transformer oil substances.			
Accidents	(i) Worker's accidents such as falling and electric shock accident may occur in construction site. (ii) Traffic accident may occur surroundings of construction site. (iii) Leakage of fuel oil and insulator oil which may include hazardous materials due to construction work and/or operation and maintenance work by accident.	(i) (a) Management and education of workers to adhere to instructions of "Environmental Guidelines for Contractors (EGCT)". (b) Workers should be equipped with safety belts and other safety device. (c) Proper training and enlightenment of worker's safety and health to workers (ii) (a) Set and enforce speed limits. (b) Mandatory driver training. (c) Use warning signs and, where necessary, personnel to direct traffic. (iii) (a) Need to design appropriate protection devices against accidental discharge of transformer oil substances.			
<b>(2) Natural Environment</b>					
Ground water condition	Underground water use for installation work may compete with community water supply.	Consult with community and/or the village chief to obtain consensus about provision or extraction of groundwater.	Contractor	MOEn, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	To be included in Construction Cost by Contractor
Flora, Fauna, Ecosystem and Biodiversity	(i) In Kenya there are found many precious plant and animal species as well as important areas of valuable ecosystem and biodiversity. However, the power distribution facilities are not located within or close to the areas. (ii) Cutting trees and removal of	(i) KPLC will pay wayleaves compensation to PAPs, if required. (ii) Clear limited areas only where the pole will be erected, (iii) Select alternative alignments to avoid sensitive natural features			

Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
	crops are anticipated due to the occurrence of Wayleaves acquisition, in case they are close to and/or under/on/over the distribution facilities.				
<b>(3) Environmental Pollution</b>					
Air pollution	Exhaust emissions are likely to be generated by the vehicles used to ferry materials and construction machines during the construction work. In addition, generation of dust from construction work is also anticipated. These emissions may cause negative impact on air quality, although temporary.	(i) Drivers shall not leave vehicles idling so that exhaust emissions are lowered. (ii) Maintain all machinery and equipment in good working order to ensure minimum emissions are produced. (iii) Enlightenment and education of construction workers for prevention or minimize air pollutants generation.	Contractor	MOEn, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	To be included in Construction Cost by Contractor
Water pollution	(i) A small scale excavating activities for the construction work will be undertaken mostly in flat and small area with a circle of about 1m diameter for erecting electric poles. In addition, soil will be back-filled in the same place, if not wasted, or delivered to storage sites of KPLC. Thus, soil runoff and subsequent water pollution is hardly anticipated. (ii) However, there is a possibility of surface water and groundwater contamination in case of accidental fuel/engine oil spill from construction vehicles and machines.	(i) If soil runoff is inevitable and will result in generation of wastewater containing organic and inorganic components and/or oily components, wastewater should be discharged after treatment by simple filter simple treatment. (ii) Train workers in safe fuel handling such as Using drip pans to contain any spills during refueling activities.			
Soil contamination	(i) Leakage of insulating oil is from transformers as well as from fuel of	(i) (a) Store fuel and chemicals on an impermeable surface with a bund that			

Environmental Management Plan (EMP)

Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
	<p>constructing vehicles and machines is anticipated arising from a fault, poor handling and vandalism. These leaks may result in potential contamination of soil. (ii) In addition, soil contamination is expected due to unsafe disposal of creosote-treated distribution poles.</p>	<p>will hold enough capacity of fuel and chemicals stored, (b) Need to design appropriate protection devices against accidental discharge of transformer oil substances. (c) Train workers in safe fuel handling such as Using drip pans to contain any spills during refueling activities. (ii) Safe handling and disposal of creosote- treated pole in installation and renewal.</p>			
Solid waste	<p>(i) Generation of general waste such as garbage and construction solid waste such as gravel, stone, soil and logged trees is expected due to the construction work. (ii) Replacement of old transformers and wooden poles to new ones may generate hazardous solid waste, if they contain creosote and other toxic materials.</p>	<p>(i) (a) Preventive measures for reduction, proper treatment and disposal of solid waste during construction stage and operation stage in the plan. (b) Reflect concept of 3R (Reduce, reuse and recycle) to the plan. (c) Enlighten awareness of waste management to workers and employees. (ii) (a) Solid waste contaminated with hazardous materials should be segregated, transferred and stored with the name plate in sealed containers or leak-proof plastic bags, which are installed in the special warehouse of KPLC regional office with roof and wall. (b) Proper waste management including storage, treatment and disposal will be carried out after consultation with relevant governmental organizations such as NEMA and local government referring to the Regulation and the Policy such as industrial standards and The</p>			

Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
		Environmental Management Coordination (Waste Management Regulations): Legal Notice 121 (2006) and The National Solid Waste Management Strategy (2015).			
Noise and Vibration	Generation of noise and vibration are expected due to operation of construction vehicles and machines during construction work.	(i) Maintain all work equipment at optimal operating condition (ii) Working during sensitive hours and locating construction machines close to sensitive receptors shall be avoided. (iii) Work through community liaison officers to agree on working hours and to respond promptly to complaints. (iv) Use equipment with low-noise and vibration. (v) Installation of soundproof walls/acoustic enclosures and provision of buffer zones. (vi) Monitor noise levels at sensitive receptors (residential areas, schools, hospitals) (vii) Work through community liaison officers to agree on working hours and to respond promptly to complaints.			
<b>(III) Operation Stage</b>					
<b>(1) Social Environment</b>					
Public health and Sanitation	There is a possibility of deterioration of public health conditions due to generation of air and water pollutants and solid waste, if pollution control management in construction work is not conducted appropriately.	(i) Preventive measures to control air pollutants emission in construction work. (ii) Monitor public health condition by medical examination.	KPLC	MOEn, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	To be included in KPLC budget

Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
Infectious diseases such as HIV/AIDS	In many developing countries spreading of infectious diseases such as HIV/AIDS were often reported due to contact of inflowing workers with affected peoples at their camp in construction work. Thus, it is expected somewhat spreading of infectious diseases during construction stage.	(i) Public awareness of the public health issues identified. (ii) Provision of condoms, (iii) Distribution of HIV/AIDS awareness materials in collaboration with NACC (National Aids Control Council). (iii) Monitoring cases of HIV/AIDS before and after the construction phase. (iv) Enlightenment and campaign of prevention and cure of HIV/AIDS.			
Working condition including occupational safety	Adverse impacts on working condition including occupational safety are expected somewhat due to insufficient management for workers at construction work, and at operation and maintenance of power distribution facilities.	(i) Adequate ladder should be provided. (ii) Provision of climbing shoes. (iii) Provide safety harness. (iv) Use of personal protective equipment like gloves, helmet, climbing shoes, harnesses etc. (v) Use of signs, barriers and education/public outreach to prevent public contact with potentially dangerous equipment. (vi) Community policing to be encouraged to reduce vandalism of transformers and distribution cables.			
Hazard/risk (disaster, security)	Hazard and risk are anticipated somewhat for following cases: (i) Damage to distribution facilities due to thunderbolt, strong wind and fires. (ii) Electric shock and electrocution due to accidental contact with transformers. (iii) Leakage of insulator oil which may include hazardous materials due to	(i) Timely maintenance of installed sites. (ii) Prevent encroachment and enforce restrictions of activities in installed sites by proper wiring. (iii) Post warning signs and properly install electrical poles with anti-climbs to prevent access to transformers by unauthorized personnel. (iv) Provide safety belts and include log-out/tag-out procedures to workers of operation			



Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
	deterioration of transformers. (iv) Leakage of creosote oil from dilapidated electric poles. (v) Deterioration of the facilities due to vandalism of workers and local people.	and maintenance. (v) Create public and staff awareness on the electrical safety rules as set out in Kenya power safety book. (vi) Proper public education to the people on safe use of electricity. (vii) No open burning in the vicinity. (viii) Need to design appropriate protection devices against accidental leakage of transformer oil substances. (ix) Community policing to be encouraged to reduce vandalism of workers and people.			
Accidents	(i) Occurrence of electric shock and electrocution by accidental contact with equipment such as transformers at installed site. (ii) Leakage of fuel oil and insulator oil which may include hazardous materials by accident.	(i) (a) Proper public education to the people on safe use of electricity. (b) Prevent encroachment and enforce restrictions of activities in installed sites by proper wiring. (ii) (a) Timely maintenance of transformers. (b) Need to design appropriate protection devices against accidental discharge of transformer oil substances.			
<b>(3) Environmental Pollution</b>					
Water pollution	(i) A small scale excavating activities for the construction work will be undertaken mostly in flat and small area with a circle of about 1m diameter for erecting electric poles. In addition, soil will be back-filled in the same place, if not wasted, or delivered to storage sites of KPLC. Thus, soil runoff and subsequent water pollution is hardly anticipated. (2) However,	(II) (i) If soil runoff is inevitable and will result in generation of wastewater containing organic and inorganic components and/or oily components, wastewater should be discharged after treatment by simple filter simple treatment. (ii) Train workers in safe fuel handling such as Using drip pans to contain any spills during refueling activities.	KPLC	MOEn, NEMA, Relevant organizations of central and local Government (Road, Forest, Farmland, etc.)	To be included in KPLC budget

Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
	<p>there is a possibility of surface water and groundwater contamination in case of accidental fuel/engine oil spill from construction vehicles and machines.</p>				
<p>Soil contamination</p>	<p>(1) Leakage of insulating oil is from transformers as well as from fuel of constructing vehicles and machines is anticipated arising from a fault, poor handling and vandalism. These leaks may result in potential contamination of soil. (2) In addition, soil contamination is expected due to unsafe disposal of creosote-treated distribution poles.</p>	<p>(1) (i) Store fuel and chemicals on an impermeable surface with a bund that will hold enough capacity of fuel and chemicals stored, (ii) Need to design appropriate protection devices against accidental discharge of transformer oil substances. (iii) Train workers in safe fuel handling such as Using drip pans to contain any spills during refueling activities. (2) Safe handling and disposal of creosote- treated pole in installation and renewal.</p>			
<p>Solid waste</p>	<p>Replacement of old transformers and wooden poles to new ones may generate hazardous solid waste, if they contain creosote and other toxic materials.</p>	<p>(i)Preventive measures for reduction, proper treatment and disposal of solid waste during construction stage and operation stage in the plan. (ii) Reflect concept of 3R (Reduce, reuse and recycle) to the plan. (iii) Enlighten awareness of waste management to workers and employees. (III) (i) Solid waste contaminated with hazardous materials should be segregated, transferred and stored with the name plate in sealed containers or leak-proof plastic bags, which are installed in the special warehouse of KPLC regional office with roof and wall. (ii) Proper waste management including storage,</p>			

Environmental Management Plan (EMP)

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Environmental item	Reasons	Mitigation Measures	Implementing Organization	Supervising Organization	Cost (KES)
		treatment and disposal will be carried out after consultation with relevant governmental organizations such as NEMA and local government referring to the Regulation and the Policy such as industrial standards and The Environmental Management Coordination (Waste Management Regulations): Legal Notice 121 (2006) and The National Solid Waste Management Strategy (2015).			

Note: (1) Implementing Organization – Contractor, KPLC, (2) Supervising Organization – KPLC, MOEn, NEMA, Relevant organizations of central and local government, etc.

Category	Method of Monitoring/ Parameter to be monitored	Monitoring Place/Point	Frequency (Period)	Implementation organization	Responsible and/or supervising org.	Cost (KES)
<b>(I) Planning Stage/Pre-Construction Stage</b>						
Environment approval/ permission for the project implementation	(1) To get approval from NEMA	NEMA, KPLC	Before commencement of construction work	KPLC	NEMA, MOEn	Within KPLC budget
	(2) Other permit/ approval such as construction permit from local government, if necessary	Construction site			MOEn, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Preparation of EMP and EHS-MP by Contractor	(1) Document of EMP and EHS-EMP by Contractor	Contractor	Before commencement of Construction work	Contractor	KPLC	To be included in the Construction cost of Contractor
<b>(II) Construction Stage</b>						
<b>(1) Social Environment</b>						
Water use	Water use for installation work may compete with community water supply.	Complaints to water use from people in the vicinity	Daily at construction sites and the vicinity	Contractor	MOEn, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	To be included in the Construction cost of Contractor
Existing social infrastructures and services	Physical observation and complaints from people in the vicinity	Visual observation and hearing with residents and road users				
16) Public health and Sanitation	Report and complaints from people in the vicinity	People in the vicinity				
Infectious diseases such as	Report outbreak of infectious disease from people in the vicinity and workers	People in the vicinity and workers				

Environmental Monitoring Plan (EMoP)

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Category	Method of Monitoring/ Parameter to be monitored	Monitoring Place/Point	Frequency (Period)	Implementation organization	Responsible and/or supervising org.	Cost (KES)
HIV/AIDS						
Working condition including occupational safety	Report and/or complaints from workers (ii) Observation of workers conditions and occupational health, safety and environment, (iii) simple medical check of workers, if necessary	Workers				
Hazard/risk (disaster, security)	Record and report of vandalism, leakage of insulator oil, strong wind, thunderbolt, fire, etc.	Construction site, (ii) Access road to construction site, (iii) Worker's camp				
Accidents	Record and report of traffic accidents, falling of workers, electric shock, etc.					
<b>(2) Natural Environment</b>						
Ground water condition	Amount of groundwater used	Construction site and vicinity	Daily at construction sites and the vicinity	Contractor	KPLC, MOEn, Local Government, NEMA	To be included in the Construction cost of Contractor
Flora, Fauna, Ecosystem and Biodiversity	(1) Number and extent of damage trees logged and crops removed, (2) Complains from people	Construction site and vicinity				
<b>(3) Environmental Pollution</b>						
Air pollution	Qualitative evaluation by physical observation, (ii) Complaints from people in the vicinity and workers	Construction site, access road and vicinity	Daily at construction sites and the vicinity	Contractor	KPLC, MOEn, Local Government, NEMA	To be included in the Construction cost of Contractor
Water Pollution	Qualitative evaluation by physical observation, (ii) Complaints from people in the vicinity and workers					
Soil contaminatio	(i) Physical observation, (ii) Record of machine and fuel oil for construction,	(i) Construction site, (ii) Worker's camp, (iii)				

Category	Method of Monitoring/ Parameter to be monitored	Monitoring Place/Point	Frequency (Period)	Implementation organization	Responsible and/or supervising org.	Cost (KES)
n	(iii) Complaints from people in the vicinity	Storage facility of solid waste				
Solid waste	Record of solid waste management (generation, collection, treatment and disposal), (ii) Complaints from people in the vicinity	(i) Construction site, (ii) Worker's camp, (iii) Storage facility of solid waste				
Noise and Vibration	Physical observation, (ii) Complaints from people in the vicinity and workers, (iii) Measurement by sound level meter, if necessary.	Construction site, access road and vicinity				
<b>(III) Operation Stage</b>						
<b>(1) Social Environment</b>						
Public health and Sanitation	Report and complaints from people in the vicinity	Installed sites and the vicinity	In response to report and complaints	KPLC	MOEn, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Infectious diseases such as HIV/AIDS	Report outbreak of infectious disease from people in the vicinity and workers					
Working condition including occupational safety	Report and/or complaints from workers (ii) Observation of workers conditions and occupational health, safety and environment, (iii) simple medical check of workers, if necessary					
Hazard/risk (disaster, security)	Record and report of vandalism, leakage of insulator oil, strong wind, thunderbolt, fire, etc.					
Accidents	Record and report of traffic accidents, falling of workers, electric shock, etc.					

Environmental Monitoring Plan (EMoP)

Category	Method of Monitoring/ Parameter to be monitored	Monitoring Place/Point	Frequency (Period)	Implementation organization	Responsible and/or supervising org.	Cost (KES)
<b>(3) Environmental Pollution</b>						
Water Pollution	(i) Data about material composition of transformer insulator oil, and machine and fuel oil and record of usage, (ii) Physical observation, (iii) Complaint from workers and people in the vicinity (iv) Inspection proper handling and storage situation of solid waste contaminated with hazardous materials in storage containers and facilities.	(i) Construction site and its vicinity, (ii) Hazardous waste storage facility	In response to report and complaints	KPLC	KPLC, MOEn, Local Government, NEMA	KPLC budget
Soil contamination						
Solid waste						

Note: (1) Implementing Organization – Contractor, KPLC, (2) Supervising Organization – KPLC, MOEn, NEMA, Relevant organizations of central and local government, etc.

(1) Environmental Monitoring Form

Environmental Monitoring Plan based on JICA Format is shown in Tables below.

1) Planning Stage

i) Approval and Permit, EMP Preparation by Contractor, etc.

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Environment approval/ permission for the project implementation	(1) To get approval from NEMA	NEMA, KPLC	KPLC	NEMA, MOEn	
	(2) Other permit/ approval such as construction permit from local government, if necessary	Construction site	Contractor	KPLC, MOEn	
Preparation of EMP and EHS-MP by Contractor	(1) Document of EMP and EHS-EMP by Contractor	Contractor	Contractor	KPLC	

2) Construction Stage

i) Social Environment

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Water use	Complaints to water use from people in the vicinity	Water use for construction	Contractor	KPLC, MOEn, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Traffic congestion and disturbance of access due to construction work	Physical observation and complaints from people in the vicinity	Visual observation and hearing with residents and road users			
Health condition of people in the vicinity	Report and complaints from people in the vicinity	People in the vicinity			



Development infectious diseases such as HIV/AIDS	Report outbreak of infectious disease from people in the vicinity and workers	People in the vicinity and workers			
Occupational health and safety conditions of workers	Report and/or complaints from workers (ii) Observation of workers conditions and occupational health, safety and environment, (iii) simple medical check of workers, if necessary	Workers			
Risk for disaster and public security	Record and report of vandalism, leakage of insulator oil, strong wind, thunderbolt, fire, etc.	Construction site, (ii) Access road to construction site, (iii) Worker's camp			
Accident (traffic accident, falling, electric shock, etc.)	Record and report of traffic accidents, falling of workers, electric shock, etc.				

ii) Natural Environment

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Groundwater use condition	Amount of groundwater used	Construction site and vicinity	Contractor	KPLC, MOEn, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Damages of trees and crops due to construction work	(1) Number and extent of damage trees logged and crops removed, (2) Complains from people	Construction site and vicinity			

iii) Environmental Pollution

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Feature of air pollution	Qualitative evaluation by physical observation, (ii) Complaints from people in the vicinity and workers	Construction site, access road and vicinity	Contractor	KPLC, MOEn, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Feature of water pollution	Qualitative evaluation by physical observation, (ii) Complaints from people in the vicinity and workers				
Feature of soil contamination	(i) Physical observation, (ii) Record of machine and fuel oil for construction, (iii) Complaints from people in the vicinity	(i) Construction site, (ii) Worker's camp, (iii) Storage facility of solid waste			
Feature of solid waste management	Record of solid waste management (generation, collection, treatment and disposal), (ii) Complaints from people in the vicinity				
Feature of ambient noise and vibration	Physical observation, (ii) Complaints from people in the vicinity and workers, (iii) Measurement by sound level meter, if necessary.	Construction site, access road and vicinity			

3) Operation Stage

i) Social Environment

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Health condition of people in the vicinity	Report and complaints from people in the vicinity	Installed sites and the vicinity	KPLC	MOEn, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Development infectious diseases such as HIV/AIDS	Report outbreak of infectious disease from people in the vicinity and workers				
Occupational health and safety conditions of workers	Report and/or complaints from workers (ii) Observation of workers conditions and occupational health, safety and environment, (iii) simple medical check of workers, if necessary				
Risk for disaster and public security	Record and report of vandalism, leakage of insulator oil, strong wind, thunderbolt, fire, etc.				
Accident (traffic accident, falling, electric shock, etc.)	Record and report of traffic accidents, falling of workers, electric shock, etc.				

ii) Environmental pollution

Monitoring Item	Monitoring Method/ Indicator	Monitoring Place	Implementing Organization	Supervising Organization	Situation during Reporting
Feature of Water pollution	(i) Data about material composition of transformer insulator oil, and machine and fuel oil and record of usage, (ii) Physical observation, (iii) Complaint from workers and people in the vicinity	(i) Construction site and its vicinity, (ii) Hazardous waste storage facility	KPLC	MOE, NEMA, Local authorities (Local government, Ministry of Agriculture, Kenya Forest Service, Road, etc.)	
Feature of Soil Contamination					
Feature of solid waste generation, treatment and disposal					

(2) Social Monitoring Form (Involuntary Resettlement)

Social Monitoring Plan based on JICA Format is shown in Tables below.

As described above, according to policy of KPLC, end-users agree with KPLC to get no compensation even for damage of property such as trees due to Wayleaves acquisition in advance. The reasons are as follows: (i) The project is as a part of LMCP initiated by the GoK, (ii) LMCP may bring about many beneficial impacts on end-users.

i) Consultation with peoples

No.	Date and Time	Place	Contents of Consultation and Response to Comments from peoples and Response

ii) Complaints from peoples

Number of Complaints	Features of Complaints	Measures and Results

iii) Other Issue to be considered

Issue	Contents

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process?	N (Y)	-According to the JICA Guidelines for Environmental and Social Considerations (2010.4), the project was classified as “Category B”, which is required an IEE level study. Thus, JICA study Team carried out an IEE level study and prepared IEE reports.  -Separately, KPLC will conduct Environmental Screening of the Project to get Clearance Letter from NEMA.
		(b) Have EIA reports been approved by authorities of the host country's government?	N (Y)	-According to KPLC, Environmental Screening has been done for different phases of the LMCP and got environmental approval as Clearance Letters from NEMA.  -Regarding the environmental approval of the Project, KPLC will conduct Environmental Screening of the Project to get Clearance Letter from NEMA as an evidence of environmental approval and submit a copy of the Letter to JICA Study Team within 1 month after Grant Aid Agreement (March of 2019) according to e-mail from KPLC as of February 13 <sup>th</sup> 2019.
		(c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?	N (Y)	According to Clearance Letters form NEMA, it is not known whether some conditions were imposed or not. Copies of Clearance Letters will be submitted to the Study Team.
		(d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	N (Y)	-Permission of wayleaves acquisition for affected subjects in public spaces such as roads from such as Road authority.  -Permission of construction from relevant organizations such as County/ Constituency government will be obtained before provision of electric facilities or commencement of installation work.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local	N (Y)	Stakeholder meetings (SHMs) for information disclosure and public participation, hosted by KPLC were held in two places for each County from October 29th to November 1st 2018. Number of local people and anticipated PAPs are 131, 164, 119 and 145 persons for Nakuru, Nyandarua, Kilifi and Kwale County, respectively. Project plan and the potential impacts were adequately explained to the local stakeholders at the SHMs. It was recognized that people were eagerly requesting more and earlier power connection.  According to policy of KPLC, end-users agree with KPLC to get no compensation even for damage of property such as trees due to Wayleaves acquisition in advance. The reasons are as follows: (i) The project is as a part of LMCP initiated by the GoK, (ii) LMCP may bring about many beneficial impacts on end-users.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		stakeholders?		However, the above mentioned KPLC policy was not fully publicized in some areas of Nyandarua County. Then, stakeholder meeting was held to explain again on January 11th, 2019 and obtained consensus of the participants.
		(b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	N (Y)	Following comments, which were provided by people through stakeholder meetings, will be reflected to revision of project design and implementation of the project: (i) expectation of many beneficial due to the project and active cooperation with the project, (ii) promote the understanding of procedures of electricity connection and payment of connection charge, (iii) To introduce good contractors of electricity connection, (iv) To secure safety for connection and using electricity, (v) Expansion of the connection to households of elders and younger generation, and premises beyond 600m distance from installed transformer.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	N (Y)	-Alternative energy use plans were examined with usage of kerosene, diesel generator, batteries etc. as well as the case of without the project. -Alternative routes and locations of distribution lines were also examined in terms of demand of electricity, poverty condition, ratio of power connection, etc.
2 Pollution Control	(1) Water Quality	(a) Is there any possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? If the water quality degradation is anticipated, are adequate measures considered?	N	Earthmoving activities will be undertaken mostly in flat and small area with a circle of about 1m diameter for erecting poles. In addition, soil will be back-filled in same place, if not wasted, or delivered to storage sites of KPLC. Thus, soil runoff is hardly anticipated.
3 Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	N	The project site is located neither in protected areas nor in environmentally sensitive areas. Thus, no negative impact is expected due to the project.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	N	The project site does not encompass areas such as primeval forests, tropical rain forests, ecologically valuable habitats.
		(b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	N	The project site does not encompass areas such as primeval forests, tropical rain forests, ecologically valuable habitats.
		(c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	N	The project activities are installation and operation of transformers and poles through lower voltage line to connect electricity to users. Thus, adverse impacts due to activities such as a large amount of pollutant emission and change in natural habitat and deforestation are not anticipated.
		(d) Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife and livestock?	N	The project activities are installation and operation of transformers and poles through lower voltage line to connect electricity to users. Thus, adverse impacts due to activities such as disruption of migration routes and habitat fragmentation of wildlife and livestock are not anticipated.
		(e) Is there any possibility that the project will cause the negative impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem due to introduction of exotic (non-native invasive) species and pests? Are adequate	N	The project activities are installation and operation of transformers and poles through lower voltage line to connect electricity to users. Thus, adverse impacts due to activities such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem due to introduction of exotic (non-native invasive) species and pests are hardly anticipated.



Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		measures for preventing such impacts considered?		
		(f) In cases where the project site is located in undeveloped areas, is there any possibility that the new development will result in extensive loss of natural environments?	N	The project sites are not located in undeveloped areas.
	(3) Topography and Geology	(a) Is there any soft ground on the route of power transmission and distribution lines that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed?	N	During facility designing routes and places with soft ground will be avoided. Thus, slope failures or landslides are hardly anticipated.
		(b) Is there any possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides?	N	Civil works such as cutting and filling are mostly undertaken in flat areas within a circle of about 1m diameter for erecting poles. Thus, slope failures or landslide are hardly anticipated.
		(c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	N	Civil works such as cutting and filling are mostly undertaken in flat and small area with a circle of about 1m diameter for erecting poles. In addition, soil will be back-filled in same place, if not wasted, or delivered to storage sites of KPLC. Thus, soil runoff is hardly anticipated.
4 Social	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If	Y	Installation of transformers and poles will be mostly within right-of-way and a small space. Thus, neither land acquisition nor resettlement is expected. However, wayleaves and cutting trees and crops as well as destruction of structures are somewhat anticipated. But end-users will enjoy more beneficiaries than

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?		wayleaves damage due to electricity connection. Therefore, the compensation is not necessary by the KPLC policy.
		(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?	Y	Neither land acquisition nor resettlement is expected. Regarding Wayleaves acquisition, following explanation will be done to people by KPLC officers such as Regional and Wayleaves Officers in advance. - According to policy of LMCP, end-users agree with KPLC to get no compensation even for damage of property such as trees due to Wayleaves acquisition in advance. The reasons are as follows: (i) The project is as a part of LMCP initiated by the GoK, (ii) LMCP may bring about many beneficial impacts on end-users.
		(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?	Y	As described in 4 (1) (b), according to policy of KPLC, end-users agree with KPLC to get no compensation even for damage of property such as trees due to Wayleaves acquisition considering into voluntary donation in advance.
		(d) Are the compensations going to be paid prior to the resettlement?	Y	As described in (b) end-users agree with KPLC to get no compensation in advance.
		(e) Are the compensation policies prepared in document?	Y	Compensation policy was described in letter from KPLC.as shown in Appendix 1.
		(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous	Y	Resettlement is not expected. As described 4. (1) (b), according to policy of KPLC, all the end-users agree with KPLC to get no compensation even for damage of property such as trees due to Wayleaves acquisition in advance. The reasons are as follows: (i) The project is as a part of LMCP initiated by the GoK, (ii) LMCP may bring about many beneficial impacts on end-users.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		peoples?		
		(g) Are agreements with the affected people obtained prior to resettlement?	Y	
		(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	Y	
		(i) Are any plans developed to monitor the impacts of resettlement?	Y	Relevant organizations of KPLC such as Safety, Health and Environment Department (SHED) will conduct monitoring as required.
		(j) Is the grievance redress mechanism established?	Y	The grievance redress mechanism will be established by organizations such as KPLC.(SHED and Wayleaves Section) and committee including chief of communities as well as procedures of grievance redress with any complaints and claims, if any.
	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?	Y	Through installation of distribution facilities, end-users can get many kinds of beneficial impacts such as lighting with lower cost than that by kerosene, access to TV and radio, working at night, cooking, higher security, etc. Thus, no adverse impact is expected.
		(b) Is there a possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?	Y	(i) Installation work will be conducted in a small scale and If workers engaging installation work are migrating from other places and staying in the project area during construction work, there is a possibility of developing HIV/AIDS and other infectious diseases due to contact with women. (ii) Enlighten workers and community people to know measures to avoiding and protecting against HIV/AIDS and other infectious diseases. (iii) Grasp present situation of HIV/AIDS and infectious diseases including HIV/AIDS and monitoring, if necessary.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		(c) Is there any possibility that installation of structures, such as power line towers will cause a radio interference? If any significant radio interference is anticipated, are adequate measures considered?	Y	Height of low voltage distribution line is less than 3m. Thus, a radio interference is not expected.
		(d) Are the compensations for transmission wires given in accordance with the domestic law?	Y	Compensation for wayleaves will not be necessary according to KPLC policy.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	N	No cultural, religious and historical heritage sites were found in or nearby the sites. Thus, negative impact is not anticipated.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	N	Civil works such as cutting and filling are mostly undertaken in flat areas in small area with a circle of about 1m diameter for erecting poles. In addition, soil will be back-filled in same place, if not wasted, or delivered to storage sites of KPLC. Thus, soil runoff is hardly anticipated.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	Y	At present, there is found no situation for necessary considerations with the poor and vulnerable peoples such as ethnic minorities in the communities of the project area. However, if proper care and management by local government and relevant organization are not given to them, discontent and some conflict may give rise.
		(b) Are all of the rights of ethnic minorities and	Y	All of the rights of ethnic minorities and indigenous peoples in relation to land and resources will be respected by KPLC.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		indigenous peoples in relation to land and resources respected?		
(6) Working Conditions	(a)	Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?	Y	Measures to abide Law on labor and the proposed Law on Occupational Health and Safety will be incorporated into the EMP and to be monitored in the construction work
	(b)	Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?	Y	Following tangible considerations will be incorporated in Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP): (i) Any worker and personnel who enter into construction sites have to bear safety shoes and hats for construction works. (ii) Site manager of the contractor must conduct morning assembly every day by collecting all the labourers and give instructions to them on safety control of construction site and thoroughly conduct safety management of the site. (iii) In the construction site where heavy machines for construction are operated, intrusiveness except concerned parties should be banned. (iv) Consider safety handling and storage in airtight containers of hazardous and dangerous materials.
	(c)	Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?	Y	Preparation of Environment, Health and Safety Management Plan (EHS-MP) and conducting education of traffic safety and public and occupational health to workers and staff. (d) Proper management and education of guards and/or relevant personnel not to infringe safety and security of residents and staff and workers.
	(d)	Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other	Y	In the project plan measures to control security guards not to violate safety of project site and residents, is incorporated, if any.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		individuals involved, or local residents?		
5. Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?	Y	<p>Following measures will be incorporated into EMP and to be monitored in the installation work.</p> <p>(1) Air pollution: (i) Use construction machines and vehicles equipped with good exhaust emission system and filled with good quality fuel and oil. (ii) Enlightenment and education of construction workers for prevention or minimize air pollutants generation. (iii) Monitor air pollutants emission and ambient air quality, if necessary.</p> <p>(2) Water pollution: (i) Proper treatment of water pollutants generated from construction work. 2) Surface run-off from the construction site shall be directed to silt traps or sedimentation basin before reuse or discharge with help of channels.</p> <p>(3) Soil contamination: (i) To keep clean storage sites of construction equipment, (ii) To install storage tank for preventing spill and leakage of lubricating oil and asphalt emulsifier etc. (iii) Training of workers for proper handling of toxic materials.</p> <p>(4) Noise pollution: (i) Working during sensitive hours and locating construction machines close to sensitive receptors shall be avoided. (ii) Use equipment with low-noise and vibration. (iii) Installation of soundproof walls/acoustic enclosures and provision of buffer zones.</p> <p>(5) Waste: (i) Consider ways to minimize waste generation in the rehabilitation work plan. (ii) Enlightenment and education of rehabilitation workers for waste management based on 3R principle (reduce, reuse, recycle). (iii) Solid waste generated will be carried out by proper segregation, collection, treatment, reuse and recycle. Then remained waste will be transferred to designated dumping site for final disposal. (iv) Hazardous waste contained in a small amount of mercury, lead, asbestos will be segregated, transferred and stored in sealed containers installed designated facilities within or near the site.</p>
		(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?	Y	No valuable natural environment (ecosystem) is distributed in surrounding areas Thus, no negative impact is anticipated due to the project.
		(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	Y	To avoid or minimize traffic disturbance and nuisance to local people and communities, following measures will be conducted: 1) Prior to construction work, inform contents of the construction work and schedule, 2) Time shift of construction work. 3) Education of traffic safety and manner to construction workers and drivers, 4) Raise the traffic signal and arrange watchmen on approach road. 5) Equip sheet cover to prevent scattering dust from the bed of truck. 6) Setting staff in charge of complaints.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?	Y	In the project plan environmental monitoring program is incorporated in the project plan.
		(b) What are the items, methods and frequencies of the monitoring program?	Y	In the EMOp, items relating to expected negative impacts as well as necessary permissions are selected and indicator, methods and frequencies as well as responsible institutions are described.
		(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?	Y	In the EIA Procedures NEMA is responsible for implementing the project monitoring. However, to date institutional arrangement of the monitoring framework including budget has not been established yet in NEMA Thus, in the Project plan the monitoring will be implemented under adequate monitoring framework under the consultation with NEMA and/ or referring to the JICA Guidelines by KPLC itself.
		(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	Y	According to the EMP and EMOp of the project, environmental monitoring will be carried out to comply with both Kenyan legislations and the JICA Guidelines. In the implementation if there will be uncertainty, consult with NEMA and other related organizations to obtain their instruction.
6. Note	(1) Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Road checklist should also be checked (e.g., projects including installation of electric transmission lines and/or electric distribution facilities).	N	Not necessary.
	(2) Note on	(a) If necessary, the impacts	N	Not necessary.

JICA Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	Using Environmental Checklist	to transboundary or global issues should be confirmed, (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).		



Appendix Letter from KPLC for Compensation Policy of KPLC (as of December 10<sup>th</sup> 2018)

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Our Ref: KP1/6E/1/4/5/NKB/ewk

10<sup>th</sup> December, 2018

Energy Representative  
JICA Kenya Office  
Rahimtulla Towers  
PO Box 50072- 00200  
Nairobi

Attn: Mr. Yukio TAKAHASHI

**RE: CLARIFICATION ON WAYLEAVES AND DAMAGE COMPENSATION FOR THE LAST MILE CONNECTIVITY PROJECT (LMCP) TO BE FUNDED UNDER THE JICA GRANT.**

Reference is made to the joint meeting held on 4<sup>th</sup> December, 2018 at Kenya Power offices.

It was noted that information regarding Wayleaves and damage compensation had not been clearly communicated/clarified- as the case in Stake Holders Meeting carried out in Nyandarua County. LMCPs are initiated by the Government of Kenya (GoK) with the support of its development partners to provide access to electricity for its citizens, most of whom ordinarily would not afford the high of connection charges.

The guidelines and procedures used for LMCPs funded by the World Bank and AfDB will also be applied to the JICA funded projects. Sensitization meetings will be conducted by Kenya Power prior to commencement of the projects to inform the land owners and beneficiaries on the details and modalities of the project. Consent for Wayleaves is incorporated in the forms to be signed by the beneficiaries at the time of connection (see sample form attached).

Trees and crops damaged during construction of the power lines (expected to be minimal), will remain the property of the land owners, and considered as part of their contribution towards the project and therefore no compensation is expected to be paid. However, Kenya Power undertakes to resolve any queries or complaints that may arise to the satisfaction of the affected land owners and the concerned parties.

Yours faithfully,  
For: THE KENYA POWER & LIGHTING CO. LTD

  
ENG. DAVID MWANIKI  
AG. GENERAL MANAGER, INFRASTRUCTURE DEVELOPMENT