

## 第4章 プロジェクトの評価

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### 4-1 事業実施のための前提条件

#### (1) 「モ」国側負担事項の遵守

本プロジェクトの実施にあたっては、「モ」国側負担として合意された事項が遅延なく実施されることが必要である。そのために EDM は事前に予算を確保し、有能な実施体制を固め、各負担事項の実施に臨む必要がある。

### 4-2 プロジェクト全体計画達成のために必要な相手方投入事項

プロジェクトの効果を発現・持続するために「モ」国側が取り組むべき主な事項は以下のとおりである。

- 1) 有能な運営・維持管理スタッフの配置
- 2) 運営・維持管理に必要な予算確保

### 4-3 外部条件

#### (1) ナカラ回廊地域の継続的な発展

本プロジェクトの効果が発現・持続されるためには、今後ともナカラ回廊地域における持続的な経済発展が必要となる。

#### (2) チムアラ～ナカラ送電線増強計画の実施

本プロジェクトは電力マスタープランの中で、北部系統の 400kV 送電線の新設計画に織り込まれている事業であり、その効果を十二分に発現するには、前述したチムアラ～ナカラ送電線増強計画の早期完了が期待される。

#### (3) 将来の北部電源開発および送配電網強化事業

チムアラ～ナカラ送電線増強計画が実施・完了されると、本プロジェクトで建設されるナミアロ変電所は北部地域の基幹変電所となる。その後も本変電所が将来にわたりナカラ回廊地域を含む北部の経済発展に寄与するためには、上述の送電線増強計画のみならず、予想される需要に見合った北部地域の電源開発と、さらなる送配電網の強化が必要となり、我が国の支援による関連調査も予定されている。

## 4-4 プロジェクトの評価

### 4-4-1 妥当性

#### (1) プロジェクトの裨益対象

本プロジェクトの実施によりナカラ回廊沿いの電化が促進され、地域の貧困削減への貢献が期待できる。

#### (2) 中・長期的開発計画の目標達成への貢献

4-3 項で述べたとおり、本プロジェクトは電力マスタープランの一部を構成する重要な事業であり、本プロジェクト完了に続き、中長期的開発計画に資するさらなる開発が計画されている。

#### (3) 我が国の援助政策・方針との整合性

我が国は対「モ」国への援助基本方針（大目標）として「潜在力を生かした持続可能な経済成長の推進と貧困削減」を掲げ、その中で以下の重点分野（中目標）を定めている。

- 1) 回廊開発を含む地域経済活性化
- 2) 人間開発
- 3) 防災・気候変動対策

本プロジェクトの実施は「回廊開発を含む地域経済活性化」という目標に合致し、我が国の援助方針に整合し、協力の妥当性は高いといえる。

### 4-4-2 有効性

本プロジェクト実施により期待されるアウトプットは下記のとおりである。

#### (1) 定量的評価

本プロジェクトの有効性評価のための定量的効果指標を表 4-1 のとおり設定した。

表 4-1 定量的効果指標

指標名	基準値 (2014 年実績値)	目標値(2020 年) (事業完成 3 年後)	参考(2020 年) 事業を実施しなかつた場合
1. ナミアロ・モナポ地区 110kV 系統の変電設備容量(MVA) (注 1)	16	56	16
2. ナミアロ・モナポ地区の 110/33 kV 変圧器の負荷率 (%)	56	38	131

(注 1) 変電設備容量は、モナポ変電所およびナミアロ変電所の合計とする。

## (2) 定性的評価

ナミアロ変電所を新設することにより、ナミアロ地区 33kV 配電線への電力供給能力が強化されるとともに、モナポ変電所の負荷を一部ナミアロ変電所に切替えることにより、ナミアロ・モナポ地区の電力供給能力が向上し、同地区の経済活動及び市民生活の改善に寄与する。

資 料

## 1. 調査団氏名・所属

## 調査団氏名・所属

No.	氏名	担当	所属	現地調査期間
1	小川 忠之	総括 (第1次現地調査時)	JICA 国際協力専門員	2014/4/13 ~ 2014/4/20
2	佐藤 洋史	総括 (第3次現地調査時)	JICA 産業開発・公共政策部	2015/1/10 ~ 2015/1/18
3	坂元 芳匡	計画管理 (第1次現地調査時)	同上	2014/4/13 ~ 2014/4/20
4	飯崎 堯	計画管理 (第3次現地調査時)	JICA 産業開発・公共政策部	2015/1/10 ~ 2015/1/18
5	泉 慶太	実施監理	JICA 資金協力業務部	2015/1/10 ~ 2015/1/18
6	河野 一虎	業務主任/施設計画1	(株)オリエンタルコンサルタンツグローバル 総合開発事業部 プロジェクト開発部	2014/4/13 ~ 2014/4/25 2014/6/1 ~ 2014/6/21 2015/1/10 ~ 2015/1/18
7	垣添 博之	変電設備1	東電設計(株) 電気本部 電気本部	2014/4/13 ~ 2014/4/25 2014/6/8 ~ 2014/6/21 2015/1/10 ~ 2015/1/18
8	長谷川 義次	変電設備2	(株)オリエンタルコンサルタンツグローバル 総合開発事業部 プロジェクト開発部	2014/4/13 ~ 2014/4/25 2014/6/1 ~ 2014/6/21
9	高瀬 英和	電力計画	東電設計(株) 電気本部	2014/4/13 ~ 2014/4/25 2014/6/1 ~ 2014/6/21
10	村田 孝一	配電設備	東電設計(株) 海外事業本部	2014/4/13 ~ 2014/5/4
11	門脇 拡	施設計画2/自然条件	(有)ジャイロス	2014/4/20 ~ 2014/5/4 2014/6/3 ~ 2014/6/21
12	藤田 和夫	調達計画/積算	(株)岩崎	2014/6/3 ~ 2014/6/21
13	ジャヤモハン ソーマスンダ	環境社会配慮	(株)オリエンタルコンサルタンツグローバル プランニング事業部 地球環境部	2014/4/20 ~ 2014/5/4 2014/6/3 ~ 2014/6/21

## 2. 調査行程



## 第1次現地調査日程

日数	月日		総括	計画管理	業務主任/ 施設計画1	変電設備1	変電設備2	電力計画	配電設備	施設計画2/ 自然条件	環境社会配慮	
			小川忠之	坂元芳匡	河野 一虎	垣添 博之	長谷川 義次	高瀬 英和	村田 孝一	門脇 拓	ジャヤモハン ソーマスダ	
1	4/13	日	移動(東京→マプト 翌朝着)									
2	4/14	月	JICA事務所にて打合せ / EDMとのキックオフミーティング									
3	4/15	火	移動(マプト→ナンブラ) / ナンブラ220、ナンブラセントラル調査						配電設備調査 (ナンブラ泊)			
4	4/16	水	ナミアロサイト、モナボ変電所、ナカラ変電所調査 / 移動(ナンブラ→マプト)									
5	4/17	木	EDM/MOEとの協議				データ収集 協議	ナンブラ220, ナンブラセン トラル調査				
6	4/18	金	JICA事務所 / 大使館への調査報告									
7	4/19	土	移動(機中泊)		データ整理			ナンブラ→ マプト	データ整理			
8	4/20	日	日本着		データ整理					移動(東京→マプト 翌朝着)		
9	4/21	月			データ収集、EDMとの協議				配電設備調査 (ナンブラ泊)	EDM 協議 / 再委託先との 協議 (地形地盤 調査)	EDM 協議 / 再委託先との 協議 (環境社会 配慮)	
10	4/22	火			データ収集、EDMとの協議							
11	4/23	水			EDMとの協議 / JICA事務所への調査報告							
12	4/24	木			移動(機中泊)							
13	4/25	金			日本着							
14	4/26	土						ナンブラ→ マプト	データ整理			
15	4/27	日						データ整理				
16	4/28	月						データ収集 EDM協議	EDM/再委託先協議			
17	4/29	火							マプト→ナンブラ移動			
18	4/30	水							ナミアロ現地調査 / ナンブラ→マプト移動			
19	5/1	木							EDM/再委託先協議			
20	5/2	金										
21	5/3	土						移動(機中泊)				
22	5/4	日						日本着				

## 第2次調査

日数	月日		業務主任/ 施設計画1	変電設備2	電力計画	変電設備1	調達計画 ／積算	施設計画2 ／自然条件	環境社会配慮
			河野 一虎	長谷川 義次	高瀬 英和	垣添 博之	藤田 和夫	門脇 拡	ジャヤモン ソーマスンダ
1	6/1	日	移動(東京→マプト) 翌朝着						
2	6/2	月	マプト着→JICAマプト事務所との協議→EDMとのキックオフ						
3	6/3	火	EDMとの協議(事業スコープ・仕様の確認・他) EDM&Norconsultとの協議(建設地最終確認) MOEおよびその他関連機関との打合せ				移動(東京→マプト) 翌朝着		
4	6/4	水					EDMとの協議 単価見積依頼等	EDMとの協議 再委託契約 鉄道局・道路局 単価見積支援	EDMとの協議 再委託契約
5	6/5	木							
6	6/6	金							
7	6/7	土	調査資料作成				調査資料作成		
8	6/8	日	移動マプト→ナンブラ			移動(東京→ ナンブラ翌朝着)	移動マプト→ナンブ ラ	調査資料作成	
9	6/9	月	ナミアロサイト視察 →ナカラ泊	ナンブラ変電所調査 →ナカラ泊	ナンブラセントラル 変電所調査	ナンブラ着	ナミアロサイト視察 →ナカラ泊	EDMとの協議 単価見積依頼支援	EDMとの協議 再委託着工確認
10	6/10	火	ナカラ港視察 →ナンブラ	メトロ変電所調査 →ベンバ泊	ナンブラ220変電所調査	ナカラ港視察 →ナンブラ	ナミアロサイト視察 →ナカラ泊		
11	6/11	水	ナンブラ→マプト	ベンバ→ナミアロ →マプト	ナミアロ変電所/配電調査→マプト	ナンブラ→マプト (am)	ナミアロサイト視察 →ナカラ泊		
12	6/12	木	EDMとの協議				EDMとの協議 単価見積依頼等		
13	6/13	金							
14	6/14	土	調査資料作成						
15	6/15	日						移動マプト→ナンブラ	
16	6/16	月						ナミアロサイト視察→ナンブラ	
17	6/17	火	EDMとの協議 & 調査資料作成				EDMとの協議 単価見積依頼等	ナンブラ→マプト	
18	6/18	水						EDMとの協議 単価見積依頼支援 再委託契約&発注	EDMとの協議 再委託契約協議
19	6/19	木	EDMとの協議 / JICA および 在モ国日本大使館 報告						
20	6/20	金							
21	6/21	土	移動(マプト→東京)						

## 第3次調査

日数	月日		JICA 総括	JICA 計画管理	JICA 実施監理	調査団 業務主任 施設計画1	調査団 変電設備1	
			佐藤 洋史	飯崎 堯	泉 恵太	河野 一虎	垣添 博之	
1	1/10	土	移動 (東京→マプト)					
2	1/11	日	マプト着					
3	1/12	月	JICAマプト事務所およびEDMとの協議					
			「モ」国他案件業務	EDMとの協議				
4	1/13	火	マプト→ナンプラ ナンプラ220、ナンプラセントラル変電所、 配電用変圧器供与先無電化村視察	「モ」国他案件業務	EDMとの協議 ・コンポーネント ・実施工程 ・概略設計 ・報告書に必要な情報			
5	1/14	水	「モ」国他案件業務  ナンプラ→マプト	EDMとの協議 ・ラップアップミーティング(協議結果確認) ・討議議事録署名(EDM側のみ)				
6	1/15	木	JICAマプト事務所とのラップアップミーティング					
7	1/16	金	中央給電指令所SCADAシステム視察			EDMとの協議 ・用地取得、他	中央給電指令所	
			「モ」国他案件業務					
8	1/17	土	移動(マプト→東京)					
9	1/18	日						

### 3. 関係者（面会者）リスト

## List of Parties Concerned in the Recipient Country

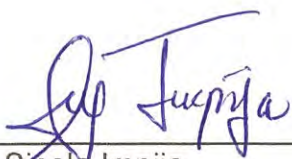
Organization	Department	Name	Position
MoE	Directorate of Studies and planning	Antonio Manda	Deputy Director
MoE	Directorate of Studies and planning	Antonio Checachama	Head of Analysis and Study Department
MoE	Directorate of Studies and planning	Izalde Jose	Technician
MoE	Directorate of Studies and planning	Jones Choluo	Head of Analysis and Study Department
EDM(Board of Directors)	Generation, Transmission, Telecominis and Market Operator	Carlos A. Yum	Board Member
EDM(Board of Directors)	Generation, Transmission, Telecominis and Market Operator	Adriano Jonas	Board Member
EDM(HQ Distribution)	Distribution & Customer Servies Directorate	Lvu Amando	Electrical Engineer
EDM (Transmission)	Transmission Network Directorate	Piloto Matola	Director
EDM (Transmission)	Transmission Network Directorate	Mario Houane	Electrical Engineer (MBA)
EDM (HQ Distribution)	Distribution & Customer Services Directorate	Alberto Rafael Banze	Director
EDM (Nacala Distribution)	Nacala Distribution Directorate	Caitano Mousao	Director
EDM (Nacala Distribution)	Nacala Distribution Directorate	Fenias Ndimande	Electrical Engineer
EDM (Nampula Distribution)	Nampula Customer Care Service	Hermirio Abrao Lucas	Director Nampula Customer Care Service
EDM (Nampula Distribution)	Nampula Area Distribution	Delfim Ali Salimo	Site Project Manager
EDM (Plan)	System Planning Directorate	Aly Sicola Impija	Director (DPS)
EDM (Plan)	System Planning Directorate	Antonio Gimo Junior	Electrical Engineer
EDM (Plan)	System Planning Directorate	Olga Cheila Utchavo	Electrical Engineer
EDM (Plan)	System Planning Directorate	Yara Assia Cabra	Electrical Engineer
EDM (Plan)	System Planning Directorate	Nilsa Pelembe	Electrical Engineer
EDM (Plan)	System Planning Directorate	Adriano Domingos Mandlate	Electrical Engineer (Substation)
EDM (Plan)	System Planning Directorate	Isaias Angelo Matshinhe	Electrical Engineer
EDM(Plan)	System Planning Direcorate	Nilda Pelembe	System & Protection Engineer
EDM(Plan)	System Planning Direcorate	Yara Assia Cabra	Electrical Engineer
EDM (Telecommunication/SCADA)	Electrification & Project Directorate	Roberto Baronet	Project Manager
EDM (Telecommunication/SCADA)	Electrification & Project Directorate	Jose Micas	Manager
EDM (ATSU)	EDM-ATSU	Bernardo Meleco	Technical Wizard Electric – CND
EDM(ATNO)	North Transmission Area	Angostinho Mucauro	Electrical Engineer (Director)
EDM(DRT)	EDM-DRT	Elisio Chaisse	Civil Technical Engineer
EDM(DRT)	EDM-DRT	Jorge Mahando	Electrical Engineer
EDM(Nampula)	Operation Department	Bernardo Nkhalamba	Chief (Nampula 220)
EDM(Nampula)	Operation Department	Geraldo Palmiro	Chief (Nampula Central)
EDM(Nampula)	Power Equipment Department	Nelson Claudio Baptista Masc	Chief
EDM(Nampula)	Protection Department	Mulate	Chief
EDM(Nampula)	Health and Safety Service Department	Jorge Namalela	Chief
EDM(Nampula)	Transmission Line Department	Jackson Evarigio Madeira	Chief
EDM(Namialo)	Customer Service Zone	Ernesto Aquimo	Chief
EDM(Monapo)	Customer Service Zone	Jose Nikot Cholaka	Chief
EDM(Monapo)	Customer Service Zone	Ijazio Barroci Isoufo	Electrician
EDM(Nampula Central)	Nampula Central	Luis Nhamuchus	Nampula Central Electrical Engineer
EDM(Communication)	Telecommunication System Unit (North)	Prosperino B.Saidane	Director
EDM(Environmental)	System Planning Directorate	Jeronimo Marrime	Environmental Manager
EDM(Environmental)	System Planning Directorate	Belarmina Mirasse Jossias	Environmental Planner (Geograpar)
EDM(Elec & Project)	Electrification & Project Directorate	Joaquim Osim	Director
EDM(Elec & Project)	Electification & Projects Directorate)	Robert Baronet	Telecommunication Engineer
EDM(Elec & Project)	Electification & Projects Directorate)	Jose Micas	Electrical Engineer
EDM(Transmission)	Transmission Network Directorate	Horacio Bive Domingos	System & Protection Engineer
EDM(Operation)	Operation Direcorate	Cristovano Novele	Operation Engineer
EDM(Equ & Pro)	Department of Equipment & protection	Feliciano Massingue	Electrical Engineer
EDM(Equ & Pro)	Department of Equipment & protection	Adriano Maudloto	Electrical Engineer
EDM(Equ & Pro)	Department of Equipment & protection	Solomone Monhigue	Electrical Engineer
Institute National Demining	-	Albelt M. Augusto	Directorate
CDN	Corredor de Desenvolvement do Norte SA	Manuel Macopa	Rail Director

#### 4. 討議議事録 (M/D)

#### 4－1. 第一次及び第二次現地調査時の討議議事録

THE MINUTES OF MEETINGS  
ON  
THE MISSION FOR THE PREPARATORY SURVEY  
ON  
THE PROJECT FOR REINFORCEMENT OF TRANSMISSION NETWORK  
IN NACALA CORRIDOR  
IN  
THE REPUBLIC OF MOZAMBIQUE  
  
AGREED UPON BETWEEN  
  
THE GOVERNMENT OF THE REPUBLIC OF MOZAMBIQUE  
  
AND  
  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Maputo, 17<sup>th</sup> June, 2014



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Mr. Aly Sicola Impija  
Director of Planning  
Electricidade de Mozambique, E.P.



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Mr. Tadayuki OGAWA  
Leader  
Preparatory Survey Team  
Japan International Cooperation Agency



The Government of Republic of Mozambique (hereinafter referred to as "GOM") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") have made several preliminary discussions in order to identify priority projects in the field of Power Sector, and agreed to make preparation for The Project for Reinforcement of Transmission Network in Nacala Corridor (hereinafter referred to as "the Project"). Accordingly, JICA dispatched a mission on the Project (hereinafter referred to as "the JICA Mission") to Mozambique from 14<sup>th</sup> to 19<sup>th</sup> April 2014 in order to develop scope and implementing arrangements of a further survey which will study outline design of the Project (hereinafter referred to as "the Preparatory Survey"). The scope and implementing arrangements of the Preparatory Survey are described in the Appendix 1. The main points discussed during its visit are described in the Appendix 2.

It should be noted that implementation of the Preparatory Survey does not imply any decision or commitment by JICA to extend its grant for the project at this stage.

Appendix 1: Scope and Implementing Arrangements of the Preparatory Survey

Appendix 2: Main Points Discussed

Appendix 3: List of Attendants

Appendix 4: Japan's Grant Aid Scheme

Appendix 5: Tentative Schedule of the Preparatory Survey

Appendix 6: Site Location of Namialo Substation

Appendix 7: Reinforcement and connection of Transmission lines



## SCOPE AND IMPLEMENTING ARRANGEMENTS OF THE PREPARATORY SURVEY

### I. BACKGROUND AND OBJECTIVES OF THE PREPARATORY SURVEY

In August of 2013, GOM made a request for Grant Aid for the Project to the Government of Japan (GOJ). GOJ decided to conduct the Preparatory Survey and entrusted JICA to examine the viability of the Project and sent the Survey team, headed by Mr. Tadayuki OGAWA, Senior Advisor on Power Sector, JICA.

### II. OBJECTIVES OF THE PROJECT

The project aims to construct the new substation at Namialo and improve the existing substations (Nampula 220 & Nampula Central) in order to bring reliability and redundancy of power supply to Nacala Corridor where power demand is rapidly increasing.

### III. ITEMS REQUESTED BY GOM

1. Project Site

Nampula, Namialo, and unserved communities alongside Nacala corridor

2. Executing Agencies, Coordination Mechanisms

Electricidade de Mozambique, E. P. (EDM)

3. Main Components

GOM finally requested to GOJ the following components.

- (1) Construction of New Namialo Substation
- (2) Rehabilitation of the existing Substation Control System ("SCS") & Substation Protection System for Nampula Central Substation
- (3) Introduction of Supervisory Control & Data Acquisition ("SCADA") for New Namialo, Nampula 220, and Nampula Central Substation
- (4) Procurement of Distribution Pole Transformer for Non Electrified Community Area
- (5) Other associated facilities

### IV. SURVEY AREA

Nacala Corridor Area between Nampula and Nacala




## **V. SCOPE OF THE PREPARATORY SURVEY**

### 1. Terms of Reference

The Preparatory Survey shall cover the following items:

- (1) Confirm the objective and contents of the Project
- (2) Study the effectiveness and validity of the Project
- (3) Identify the most suitable scope and components of the Project
- (4) Implement an outline design and project cost estimation
- (5) Propose the implementation plan and obligations of the recipient country for the Project

### 2. Desirable specialists for the Preparatory Survey

JICA will select and dispatch a survey team to carry out the Preparatory Survey.

The team will include the following specialists.

- Facility Planning
- Power Supply Planning
- Transformer Equipment
- Power Distribution
- Cost Estimation
- Environmental and Social Considerations

The assignment of the specialists may be subject to change.

The Survey team may engage local consultants, NGOs, and/or other supporting staffs.

## **VI. SCHEDULE OF THE PREPARATORY SURVEY**

The Preparatory Survey will be carried out in accordance with the tentative schedule attached in the Appendix 5. The schedule may be subject to change during the preparation and the course of the survey.

## **VII. REPORTS**

JICA will prepare and submit following reports in English to GOM.

### 1. Inception Report:

20 copies will be submitted at the commencement of the first work period in Mozambique. (already submitted on 14<sup>th</sup> April 2014)

### 2. Draft Final Report:

8 copies will be submitted 6 months after the commencement of the Preparatory Survey. This report will cover;

- (1) Outline of the Project,

- (2) Outline Design of the Project,
- (3) Outline of the undertakings of Mozambique side,
- (4) Operation and maintenance plan for the Project, and
- (5) Cost estimation.

GOM shall submit its comments within one month after the receipt of the Draft Final Report.

### 3. Final Report:

3 copies will be submitted within three months after the receipt of the comments on the Draft Final Report.

## **VIII. JAPAN'S GRANT AID SCHEME**

GOM understands the Japan's Grant Aid Scheme explained by the JICA Mission as described in Appendix 4.

## **IX. UNDERTAKINGS OF THE GOVERNMENT OF THE REPUBLIC OF MOZAMBIQUE**

### 1. For Preparatory Survey

The GOM shall act as a counterpart agency to the survey team and also as a coordinating body with other organizations concerned for the smooth implementation of the Preparatory Survey.

GOM shall, at its own expense, provide the survey team with the following items in cooperation with other organizations concerned:

- (1) security-related information as well as measures to ensure the safety of the survey team;
- (2) information as well as support in obtaining medical service;
- (3) data and information related to the Preparatory Survey;
- (4) counterpart personnel;
- (5) suitable office space with necessary equipment and secretarial service;
- (6) credentials or identification cards;
- (7) entry permits necessary for the survey team members to conduct field surveys;
- (8) support in making transportation arrangements;
- (9) support in obtaining other privileges and benefits if necessary;
- (10) confirmation of the construction site for new Namialo substation by 23rd of April 2014



(see Appendix 6);

- (11) confirmation of environmental category and requirement for environmental clearance of the project at confirmed site including access road from MICOA by 20th of May 2014. (It was confirmed on 16<sup>th</sup> June 2014 as described in Paragraph 7 of Appendix 2.)

## 2. For Implementation of the Project

GOM shall, at its own expense, be responsible to the following items for the execution of the Project as mentioned in Annex of Appendix 4.

- (1) Land acquisition if the project site and access road go beyond the Right of Way of existing 110kV transmission lines;
- (2) 33kV cables connection from substation to distribution lines;
- (3) construction of the gates and boundary fences in and around the site;
- (4) construction of the access road outside the site;
- (5) provision of the city service line to the site such as water, drainage (storm water and sewer) and telephone line;
- (6) provision of the general furniture;
- (7) disposal of removed equipment and cables from existing substations and transmission towers;
- (8) tele-communication lines or optical fiber channel for SCADA system;  
(\* it is under consideration as shown in the paragraph 6 of Appendix 2.)
- (9) data preparation for supervisory alarms, metering, and control for SCADA system;
- (10) installation of distribution transformers procured by Japanese side;
- (11) procurement and installation of LV distribution lines & credit meters for customers billing;
- (12) procurement and installation of equipment related to the installation of distribution transformer (lightning arresters, dropout fuses, cross arms, connectors, lead wire, watt hour meters, etc.);

## X. CONSULTATION

JICA and the GOM shall consult with each other in respect of any matter that may arise from or in connection with the Preparatory Survey.

END

## THE MAIN POINTS DISCUSSED

### 1. Site Location of Namialo Substation

It was confirmed that the new Namialo Substation should be located within ROW of the existing 110kV transmission lines as shown in Appendix 6.

### 2. Constraint on the Transmission system

It was confirmed that 110kV transmission line between Nampla 220 and Nampla Central is already overloaded during peak period, and EDM has been forced to interrupt some loads. In addition, the voltage at Nacala substation sometimes go below the regulation (-5% of rated voltage). JICA Team will conduct power flow analysis including stability study to confirm the necessary countermeasures to improve the conditions of power supply in Nacala Corridor area.

### 3. Distribution Pole Transformer for Non Electrified Community Area

It was agreed that Japanese side will procure Transformers only, and EDM will be responsible for the installation works. Also, procurement and installation works of LV distribution lines, credit meters, and service drop wires will be implemented by EDM.

### 4. Access road to Namialo Substation

JICA Team explained that the temporary access road will be constructed by Japanese side to carry equipment and materials to the substation. Immediately after concluding the Exchange of Notes (E/N), EDM is requested to commence profiling and bush clearing and also the construction of railway crossing for the proposed access road. Also, complete and permanent access road shall be constructed by EDM in collaboration with Ministry of Transportation and Ministry of Agriculture.

### 5. Reinforcement and connection of Transmission lines

Construction of two transmission towers indicated on Appendix 7, wiring and final connection works to Namialo Substation for 110kV transmission lines shall be included in the project. Since these works were originally not included in the project, some other components shall be excluded from the Project in exchange. JICA Team will propose the components to be excluded after the project cost examination.

### 6. Communication backbone for SCADA system

EDM requested JICA Team to include the PLC for SCADA telecommunication and proprietary telephone in the Project. Since it was originally not included in the project, it will be confirmed after the technical study and the project cost examination.

### 7. Requirement for environmental clearance of the Project

On 16<sup>th</sup> June 2014, it was confirmed that no additional study for EIA approval on this project is required since the EIA approval for Chimuara - Nacala Transmission Project does duly cover this project.

## List of Attendants

Name	Entity
Mozambique Side	
Mr. Antonio Gimo Junior	EDM System Planning Directorate
Mr. Antonio Munguanmbe	EDM System Planning Directorate (Transmission)
Mr. Jeronimo Marrime	Environmental Manager, EDM System Planning Directorate
Ms. Belarmina mirasse Jossias	Environmental Planner, EDM System Planning Directorate
Japanese Side	
Mr. Tadayuki Ogawa	JICA HQ
Mr. Yoshimasa Sakamoto	JICA HQ
Mr. Issei Aoki	JICA Mozambique
Mr. Elisio Chionze	JICA Mozambique
Mr. Kazutora Kono	Oriental Consultants
Mr. Yoshiji Hasegawa	Oriental Consultants
Mr. Hiroyuki Kakizoe	TEPSCO
Mr. Koichi Murata	TEPSCO
Mr. Hidekazu Takase	TEPSCO
Mr. Keita Hasebe	Interpreter

## **JAPAN'S GRANT AID SCHEME**

The Government of Japan (hereinafter referred to as “the GOJ”) is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on the law and the decision of the Government of Japan (hereinafter referred to as “the GOJ”), JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

### **1. Grant Aid Procedures**

The Japanese Grant Aid is conducted as follows-

- Preparatory Survey (hereinafter referred to as “the Survey”)
  - The Survey conducted by JICA
- Appraisal & Approval
  - Appraisal by The GOJ and JICA, and Approval by the Japanese Cabinet
- Determination of Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as “the G/A”)
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

### **2. Preparatory Survey**

#### **(1) Contents of the Survey**

The aim of the Survey is to provide a basic document necessary for the appraisal of the Project by JICA and the GOJ. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the implementation of the Project.



- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures are necessary to ensure 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 organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

## (2) Selection of Consultants

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

## (3) Result of the Survey

The Report on the Survey is reviewed by JICA, and after the appropriateness of the Project is confirmed, JICA recommends the GOJ to appraise the implementation of the Project.

## 3. Japan's Grant Aid Scheme

### (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 country to make a plea for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

### (2) Selection of Consultants

The consultant firm(s) used for the Survey will be recommended by JICA to the recipient




country to also work on the Project's implementation after the E/N and the G/A, in order to maintain technical consistency.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the

recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

(10) Social and Environmental Considerations

A recipient country must ensure the social and environmental considerations for the Project and must follow the environmental regulation of the recipient country and JICA socio-environmental guideline.

(End)







## Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
For The Construction of New Namialo Substation			
1	To secure land (Project site, Temporary yard and etc.)		•
2	To clear, level and reclaim the site when needed		•
3	To construct new substation		
	1) 110kV switchgears, bus and steel structures	•	
	2) 110kV/33kV Transformer	•	
	3) 33kV feeder switchgears	•	
	4) Protection relaying for both 110kV and 33kV equipment	•	
	5) Substation control board	•	
	6) Power and control cable and auxiliary devices including in-house power supply transformer	•	
	7) Power and control cable and auxiliary devices	•	
	8) Substation ground grid construction	•	
	9) 110kV transmission tower reinforcement and connection to substation	•	
	10) 33kV cables connection from substation to distribution lines		•
	11) Disposal of removed existing tower, line conductor and insulators		•
4	To construct the following facilities		
	1) The buildings	•	
	2) The gates and fences in and around the site		•
	3) The parking lot	•	
	4) The road within the site	•	
	5) The road outside the site		•
5	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the sites		
	1) Electricity		
	a. The distributing power line to the site		•
	b. The drop wiring and internal wiring within the site	•	
	c. The main circuit breaker and transformer	•	
	2) Water Supply		
	a. The city water distribution main to the site		•
	b. The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		•
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	•	
	4) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b. The MDF and the extension after the frame/panel	•	
	5) Furniture and Equipment		
	a. General furniture		•
	b. Project equipment	•	
For The Rehabilitation of Existing Substations (Nampula 220 & Nampula Central)			
6	To rehabilitate existing substations		
	1) Replacement of switching board and relaying to be renewed	•	
	2) Control cable connection and testing	•	
	3) Disposal of removed equipment and cables		•
For The Provision of SCADA & SCS at New Namialo Substation and Existing Nampula 220 & Nampula Central Substation, if needed			
7	To construct new SCADA or SCS system		
	1) Installation of new SCADA or SCS	•	
	2) Installation of RTU and control cable connection	•	
	3) Remote signal testing between SCADA/SCS and RTU	•	

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
	4) Tele-communication lines or optical fibre channel * it is under consideration (see paragraph 6 of Appendix 2)	▲	▲
	5) Data preparation for supervisory alarms and metering, and control		●
	6) Implementation of supervisory and control data	●	
For The Provision of Pole Transformer to Non-Electrified Area			
8	To provide pole transformer		
	1) MV/LV pole mounted transformers	●	
	2) Related equipment (lightning arresters, dropout fuses, cross arms, connectors, lead wire, watt hour meters, etc)		●
	3) Installation of transformers and all related equipment		●
Common For All Components			
9	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
10	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted / be borne by the Authority without using the Grant		●
11	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
12	To ensure that the facilities and equipment be maintained and used properly and effectively for the implementation of the Project		●
13	To give due environmental and social consideration in the implementation of the Project		●
14	To bear all the expenses, other than those covered by the Grant, necessary for implementation of the Project		●
15	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●

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

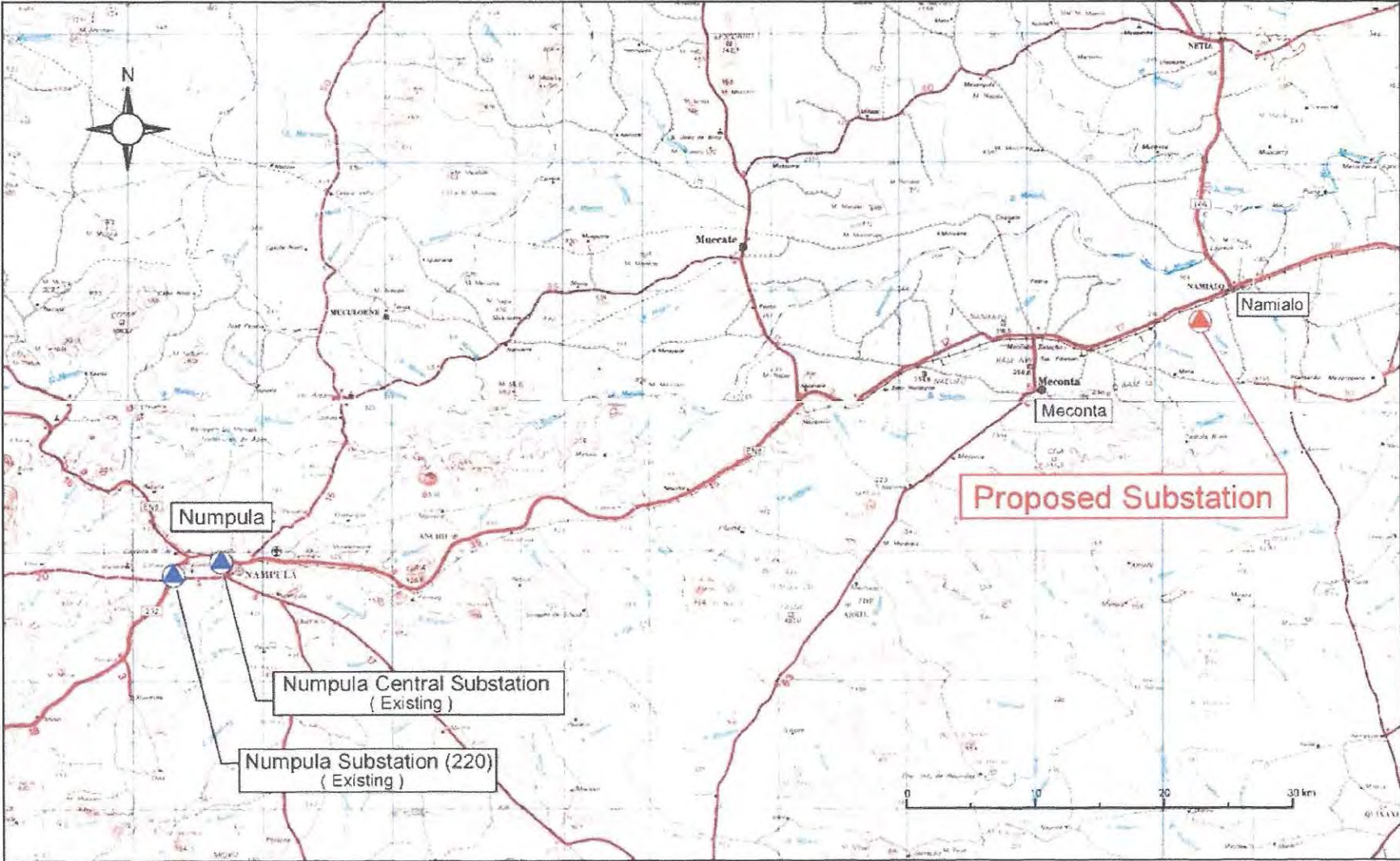
**Tentative Schedule of the Preparatory Survey**

Step	Item	2014										2015
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	
1	Preparatory works in Japan	<input type="checkbox"/>										
2	1 <sup>st</sup> Survey in Mozambique		13/Apr - 04/May									
3	1st Study in Japan		<input type="checkbox"/>									
4	2nd Survey in Mozambique				01/Jun - 21/Jun							
5	2nd Study in Japan				<input type="checkbox"/>							
6	Explanation of Draft Report in Mozambique								28/Sep - 05/Oct			
7	Preparation and submission of Final Report								<input type="checkbox"/>			

: Work in Japan       : Work in Mozambique

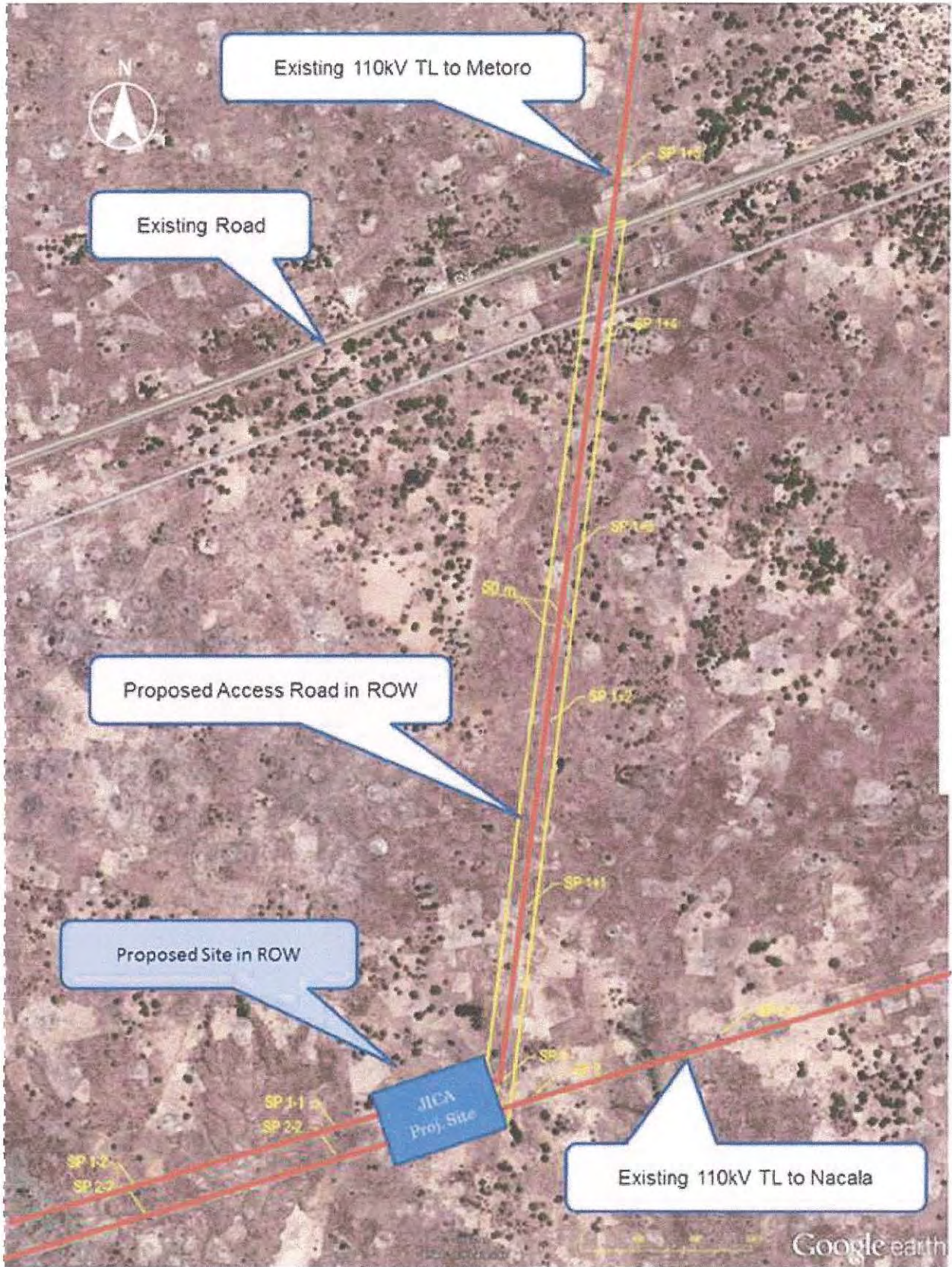



Site Location of Namialo Substation - 1

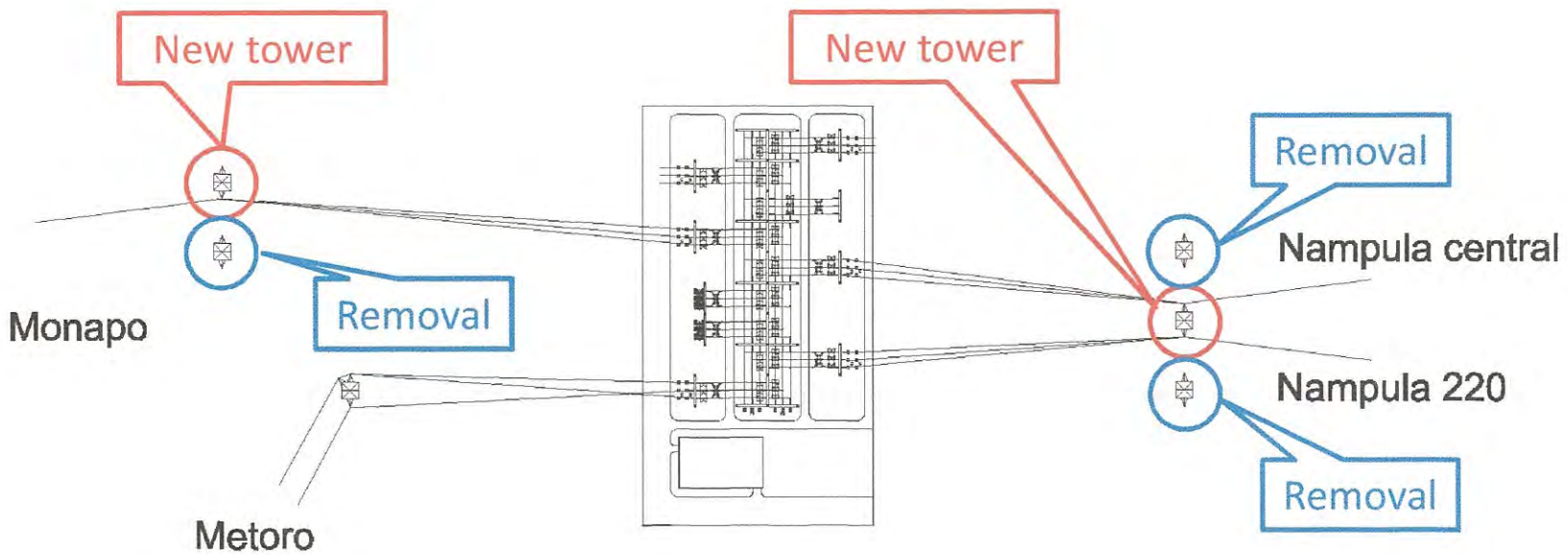


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## Site Location of Namialo Substation - 2







A4-1-18

#### 4－2. 第三次現地調査時の討議議事録


**Minutes of Discussions  
on the Preparatory Survey  
on the Project for Reinforcement of Transmission Network in Nacala Corridor  
in the Republic of Mozambique**

In response to the request from the Government of the Republic of Mozambique (hereinafter referred to as “Mozambique”), the Japan International Cooperation Agency (hereinafter referred to as “JICA”), in consultation with the Government of Japan, decided to conduct a Preparatory Survey (hereinafter referred to as “the Survey”) on the Project for Reinforcement of Transmission Network in Nacala Corridor (hereinafter referred to as “the Project”).

JICA sent to Mozambique the Preparatory Survey Team (hereinafter referred to as “the Team”) headed by Dr. Hiroshi Sato, Director, Team 2 of Energy and Mining Group, JICA. The Team is scheduled to stay in the country from 11<sup>th</sup> to 17<sup>th</sup> January, 2015.

The Team held discussions with the concerned officials of Mozambique (hereinafter referred to as “the Mozambican side”). In the course of the discussions, the Mozambican side agreed and accepted the contents of the Draft Final Report, the Mozambican side and the Team have confirmed the main items described in the sheets attached hereto.

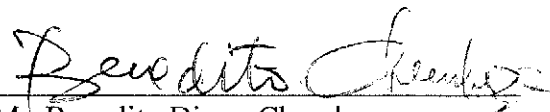
Maputo, Mozambique  
14<sup>th</sup> January, 2015



Dr. Hiroshi Sato  
Leader  
Preparatory Survey Team  
Japan International Cooperation Agency  
(JICA)



Mr. Carlos Yum  
Board Member  
Electricidade de Mozambique, E.P.  
(EDM)



Mr. Benedito Diogo Chembeze  
Deputy Director National  
Ministry of Energy

## ATTACHMENT

### 1. Contents of the Draft Final Report

The Mozambican side agreed and accepted in principle the contents of the Draft Final Report explained by the Team. The Team emphasized that the scope, the schedule and the cost for the Project are tentative and subject to change due to the domestic circumstances in Japan and in Mozambique. The Mozambican side understood it.

### 2. Objective of the Project

The Project aims to construct the new substation at Namialo (Namialo substation) and improve the existing substations (Nampula 220 & Nampula Central) in order to bring reliability and redundancy of power supply to Nacala Corridor where power demand is rapidly increasing.

### 3. Project Site

The Project sites are located as shown in Annex-1 and Annex-2.

### 4. Responsible and Implementing Organizations

- (1) The responsible sector ministry is the Ministry of Energy.
- (2) The implementing agency is Electricidade de Mozambique, E.P. (EDM)
- (3) The organization structure of the Ministry of Energy and EDM is shown in Annex-3 and 4 respectively.

### 5. Components of the Project

The major components of the Project are shown in Table below.

Components	Capacity
<b>1. Substation facilities</b>	
<b>(1) Namialo Substation</b>	
- 110/33 kV Transformer	40 MVA×1 unit
- 110 kV Gas Circuit Breaker	6 units
- 110kV Bus-bar and relevant air insulated switchgear	1 unit
- 33 kV Switchgears	6 units
- 110 kV Control and Protection Panel	6 units
- Other control panels	3units
- Low voltage facilities	1units
- Emergency Battery facilities (DC110V)	2 unit
- Emergency Battery facilities (DC48V)	1 unit
- SCADA system	1 unit
- PLC	1 unit
- 33kV outgoing distribution lines	4 lines
- Emergency generator	1 unit
- Control building and Guard house	1 unit
- New Transmission tower and conductor	2 units
<b>(2) Nampula 220 Substation (existing)</b>	
- SCADA system	1 unit
- PLC	1 unit
<b>(3) Nampula Central Substation (existing)</b>	
- SCADA system	1 unit
- PLC	2 units
<b>2. Distribution transformers for non-electrified communities along Nacala corridor</b>	
- 160 kVA distribution transformers	2 units
- 250 kVA distribution transformer	1 unit
- 33kV distribution lines for connection of transformer	3 lines

[Notes] SCADA: Supervisory Control and Data Acquisition, PLC: Power Line Carrier  
Please see Annex-5 for the details of project component selection.

## **6. Japan's Grant Aid Scheme**

- (1) The Mozambican side reconfirmed Japan's Grant Aid Scheme explained by the Team as described in Annex-6 and Annex-7.
- (2) The Mozambican side will take the necessary measures, as described in Annex-8, for smooth implementation of the Project.

## **7. Project Cost**

The Mozambican side agreed that the cost for the Project should not exceed the amount agreed on Exchange of Notes (E/N). The Mozambican side also agreed that the cost for the Project contains procurement cost of equipment, transportation cost up to the Project site, construction cost and the Consultant fees.

## **8. Confidentiality of the Project**

### **(1) Detailed specifications of the Facilities and Equipment**

The Mozambican side and the Team agreed that all the information related to the Project including detailed drawings and specifications of the facilities and equipment and other technical information shall not be disclosed to any outside parties (i.e. outside of JICA and the Mozambican side) before the conclusion of all contract(s) for the Project.

### **(2) Confidentiality of the Cost Estimation**

The Team explained the estimated cost of the Project as described in Annex-9. The Mozambican side and the Team agreed that the estimated cost for the Project should never be duplicated or disclosed to any outside parties (i.e. outside of JICA and the Mozambican side) before tender for the Project. The Mozambican side also understood that the estimated cost for the Project attached as Annex-9 is not the final and is subject to change as a result of examination through revision of the Outline Design Study.

## **9. Possibility of Change in Scope, Schedule and Cost of the Project**

The Mozambican side and the Team confirmed that the scope, the schedule, and the cost for the Project are tentative and subject to change due to the domestic circumstances in Japan and in Mozambique.

## **10. Environmental and Social Considerations**

- (1) The JICA mission explained that 'JICA Guidelines for Environmental and Social Considerations (April 2010)' (hereinafter referred to as 'the JICA Guidelines') is applicable for the Project. The Project is categorized as B because The project is not considered to be a large-scale Power Transmission and Distribution Lines project, is not located in a sensitive area, and has none of the sensitive characteristics under the JICA guidelines for environmental and social considerations (April 2010), it is not likely to have a significant adverse impact on the environment.
- (2) The Mozambican side agreed to comply with the JICA Guidelines as well as laws and regulations in Mozambique, and was requested to prepare Environmental Checklist and Monitoring Form which are designated by JICA Guidelines for an outline design.
- (3) The Mozambican side and the Team confirmed information on environmental and social considerations including major impacts and relevant mitigation measures are summarized in the Environmental Checklist attached as Annex-10. The Mozambican side will inform JICA of any major changes which may affect environmental and social considerations made for the Project by revising the Checklist in a timely manner.
- (4) The Mozambican side and the Team confirmed environmental monitoring will be conducted by EDM and the Contractor in accordance with the Environmental Management Plan and Environmental Management Monitoring Plan during the construction and operation.

- (5) EDM agreed that the results of environmental monitoring will be provided to JICA as a part of Quarterly Progress Report (hereinafter “QPR”) by filling in the monitoring form as Annex-11 on a quarterly basis during the construction and operation. In case there is a remaining issue that needs to be addressed (e.g. insufficient restoration of livelihood of displaced Project Affected Persons (PAPs)), JICA may request to extend the period of monitoring and reporting until JICA confirms the issues have been properly addressed and solved in accordance with the agreement between The Mozambican side and JICA
- (6) The Mozambican side and the JICA mission confirmed it will take stipulated procedures for information disclosure in accordance with Decree 45/2004. In addition, the JICA mission requested EDM to disclose the monitoring results to local project stakeholders, and EDM agreed to disclose monitoring results on their website.  
The Mozambican side agreed JICA’s disclosure of provided monitoring results in the Monitoring Form (Annex-11) on its website to the extent that they are made public in Mozambique. When third parties request further information, JICA disclose it, subject to approval by EDM.
- (7) The Mozambican side agreed to make necessary arrangements with concerned governmental organizations in order to secure funding for and execution of the above environmental matters in a schedule as required for smooth execution of the Project.

### 11. Major Undertakings by the Mozambican side

Major undertakings by the Mozambican side are the following (see Annex-14 for easy reference).

#### (1) 33kV distribution lines

The Mozambican side and the Team agreed that 33kV cables connection between Namialo substation and the existing distribution lines connecting to Meconta (1 line), Metoro (1 line) and Monapo (2 lines) will be covered by the Japan’s Grant Aid in order to secure smooth outcome of the impact of the Project as shown in Annex-12. Both sides also agreed that 33kV distribution lines connecting to other areas will be provided by the Mozambican side, if necessary.

#### (2) Strength analysis and reinforcement of existing transmission towers

The Mozambican side agreed to carry out the structural examination and reinforcement of existing transmission towers adjacent to new transmission towers as indicated in Annex-13 by the time of contract with a contractor of the Project in January, 2016.

#### (3) Installation of distribution transformers and LV distribution lines for non-electrified communities.

The Mozambican side and the Team agreed that the distribution transformers (2 units to “Poste de Secreteriado de 25 de Setembro” and 1 unit to “Muxaieque”) with related equipment and LV distribution lines to the Government Office and the Elementary School in “Poste de Secreteriado de 25 de Setembro” and to the Elementary School in “Muxaieque” will be covered by the Japan’s Grant Aid.

The Mozambican side agreed to carry out the detailed design and cost estimation for the rest of installation of the said LV distribution lines upon the request from the communities and execute the budget allocation by the time of signing the contract with a contractor of the Project in January, 2016. The Mozambican side also agreed to provide and install the rest of LV distribution lines in the said 2 communities in accordance with the detailed design by the completion of the Project.

#### (4) Construction of permanent access road

The Mozambican side and the Team confirmed that a contractor of the Project would provide the temporary access road during construction period. However, since it is a temporary solution, it would not be subject to Defect Liability of the contractor. In order to ensure the access route from EN12 to the Project site for daily operation and maintenance, The Mozambican side agreed to construct and maintain the permanent access road after the completion of the Project.

#### (5) Construction of railroad crossing

The Mozambican side agreed to construct the railroad crossing on the access road to the Project site in order to secure the access from EN12 to the Project site by the tender announcement in September, 2015. The Mozambican side explained that it would be conducted by CDN and EDM shall coordinate with it and secure its arrangement including the budget allocation by the time of signing the contract with a consultant of the Project in June, 2015.

(6) Power supply to the Project site

The Mozambican side and the Team agreed that the power supply to the Project site for construction works of the Project will be done by the Mozambican side. The connection cable from the existing distribution line along EN12 to the Project site will be covered by the Grant Aid. The said cable will be utilized for a part of 33kV cables connection from Namialo substation to distribution lines after the completion of the Project.

(7) Construction of gate and boundary wall

The Mozambican side agreed to construct the gate and the boundary wall of Namialo substation by the time of contract with a contractor of the Project in January, 2016.

(8) Disposal of removed transmission tower materials

The Mozambican side agreed to dispose removed materials properly after the demolition of existing transmission towers.

(9) Provision of general furniture

The Mozambican side agreed to provide the general furniture necessary for the operation of Namialo substation such as desks, chairs, racks, etc.

(10) Water supply for the operation of Namialo substation

The Mozambican side agreed to provide water supply for the operation building at Namialo substation. The Mozambican side explained that purchased water will be provided to the building with water storage tank and sewage drainage will be treated by septic tank and soak pit.

(11) Land acquisition and Site clearance

- 1) The Mozambican side and the Team confirmed that the land acquisition for Namialo substation will be needed since the Project site go beyond the Right of Way of existing 110kV transmission lines. The Mozambican side agreed to complete necessary land acquisition by the tender announcement in September, 2015.

No.	Item	Total
1	Approximate area of land to be acquired (ha)	1.88
2	Affected Households	19
3	Households to be resettled	0

- 2) The Mozambican side agreed to clear and level the construction site and access route from EN12 to the Project site by the tender announcement in September, 2015.

(12) Compensation for Land Use

The Mozambican side agreed to obtain the acceptance of Simplified Land Use Compensation Plan (SLUCP) from Ministry of Coordination for Environmental Actions (MICOA) and to compensate for the people cropping within the construction site and access route in accordance with the SLUCP by the tender announcement in September, 2015.

(13) Clearance of Mines

The Mozambican side informed that the Project site and access route are free from Mines. The Mozambican side will provide the official mine-map showing the Project site is mine-free certified by IND to JICA Mozambique office within 15 days of the signing of the Minutes.

(14) Approval of the contracts between EDM and for a consultant / a contractor by CREE

The Mozambican side ensured that the contract between EDM and a consultant / a contractor shall be approved by CREE without any delay. The Mozambican side and the Team confirmed that the contract with a consultant shall be concluded by June, 2015, and the contract with a

contractor shall be concluded by January, 2016.

(15) Tax Exemption

The Mozambican side assured the Team to ensure the budget allocation for custom duties and complete necessary governmental procedures for smooth VAT refund upon request from a consultant / a contractor of the Project.

(16) Issuance of Work Permit and VISA

The Mozambican side agreed that EDM shall facilitate with concerned agencies including the Ministry of Labor and assist Japanese nationals / others from third countries who are involved in the Project to obtain VISA and work permit smoothly so that they can enter and stay in Mozambique without any hindrance at the Project implementation stage.

(17) Project Cost to be borne by the Mozambican side

The Mozambican side assured the Team that the Project cost to be borne by Mozambican side, mentioned in Annex-9, shall be secured and allocated timely.

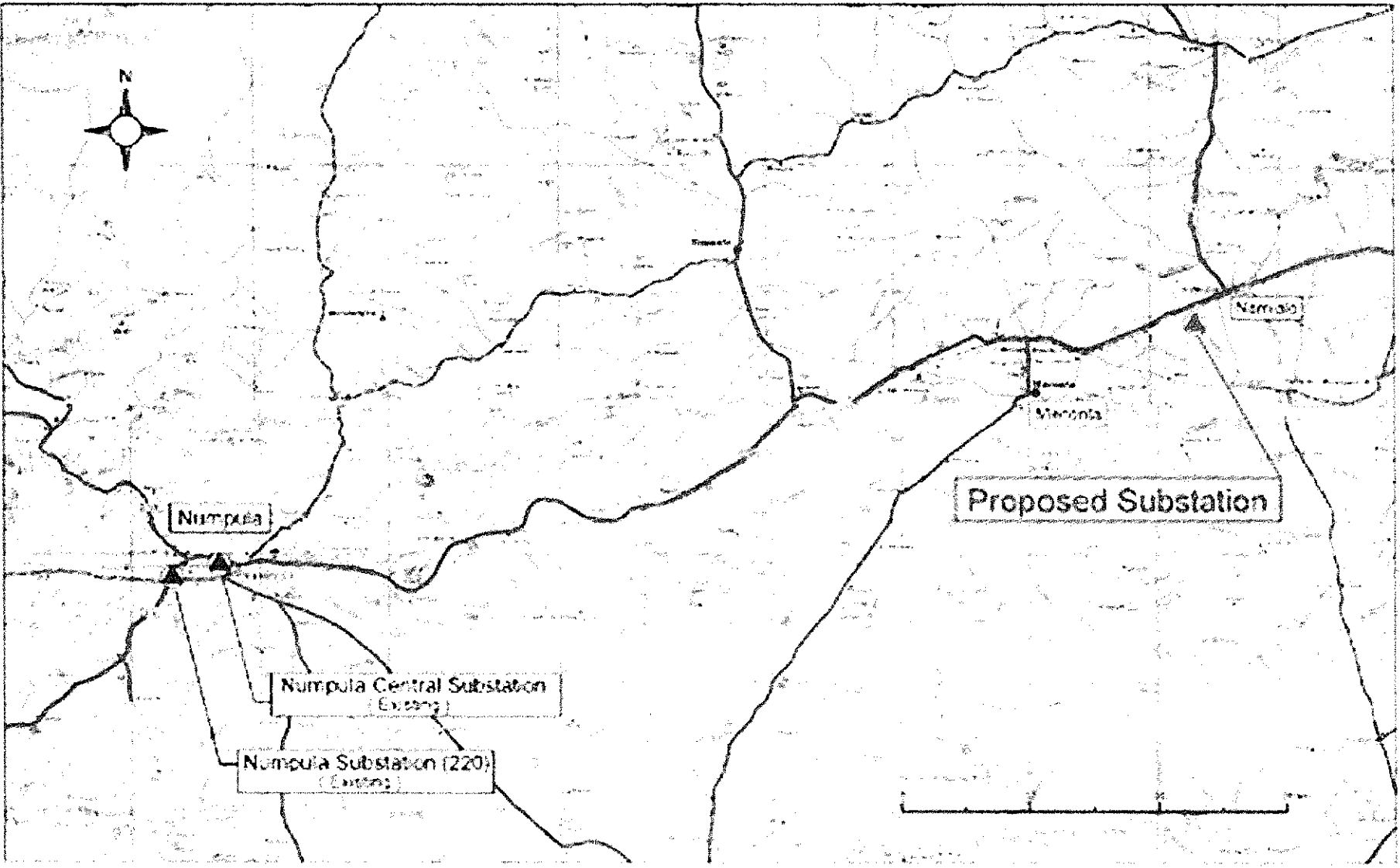
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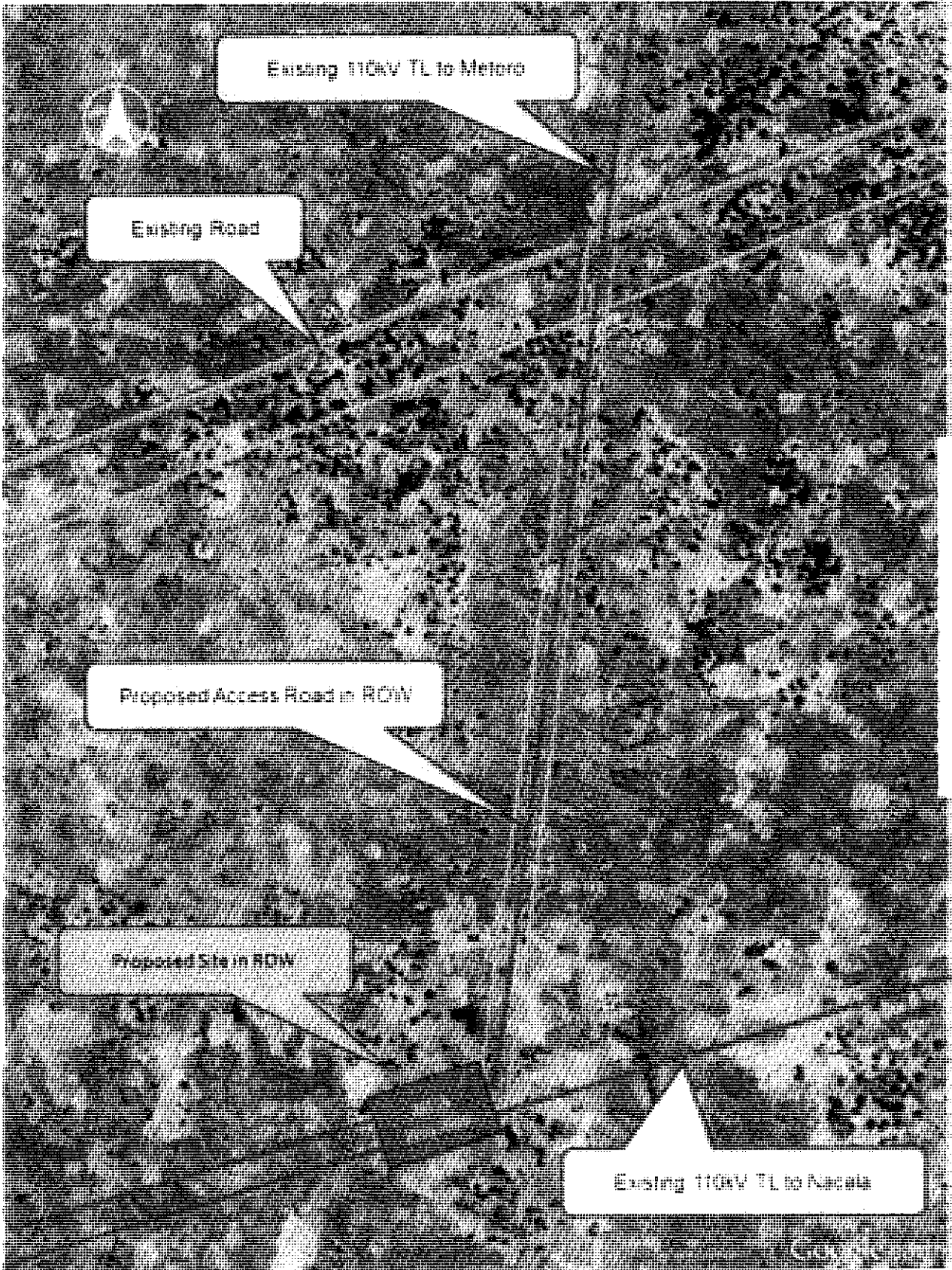
Annex-1	Location of the Project Sites
Annex-2	Layout of the Project Sites
Annex-3	Organization Structure of the Ministry of Energy
Annex-4	Organization Structure of Electricidade de Mozambique, E.P.
Annex-5	Details of Project Components Selection
Annex-6	Japan's Grant Aid
Annex-7	Flow Chart of Japan's Grant Aid Procedures
Annex-8	Major Undertakings to be taken by Each Government
Annex-9	Estimated Project Cost
Annex-10	Environmental Checklist
Annex-11	Environmental Monitoring Form
Annex-12	Overview of Layout Plan of Namialo Substation
Annex-13	Reinforcement and Connection of Transmission Lines
Annex-14	Time Flame of Major Undertakings by the Mozambican side



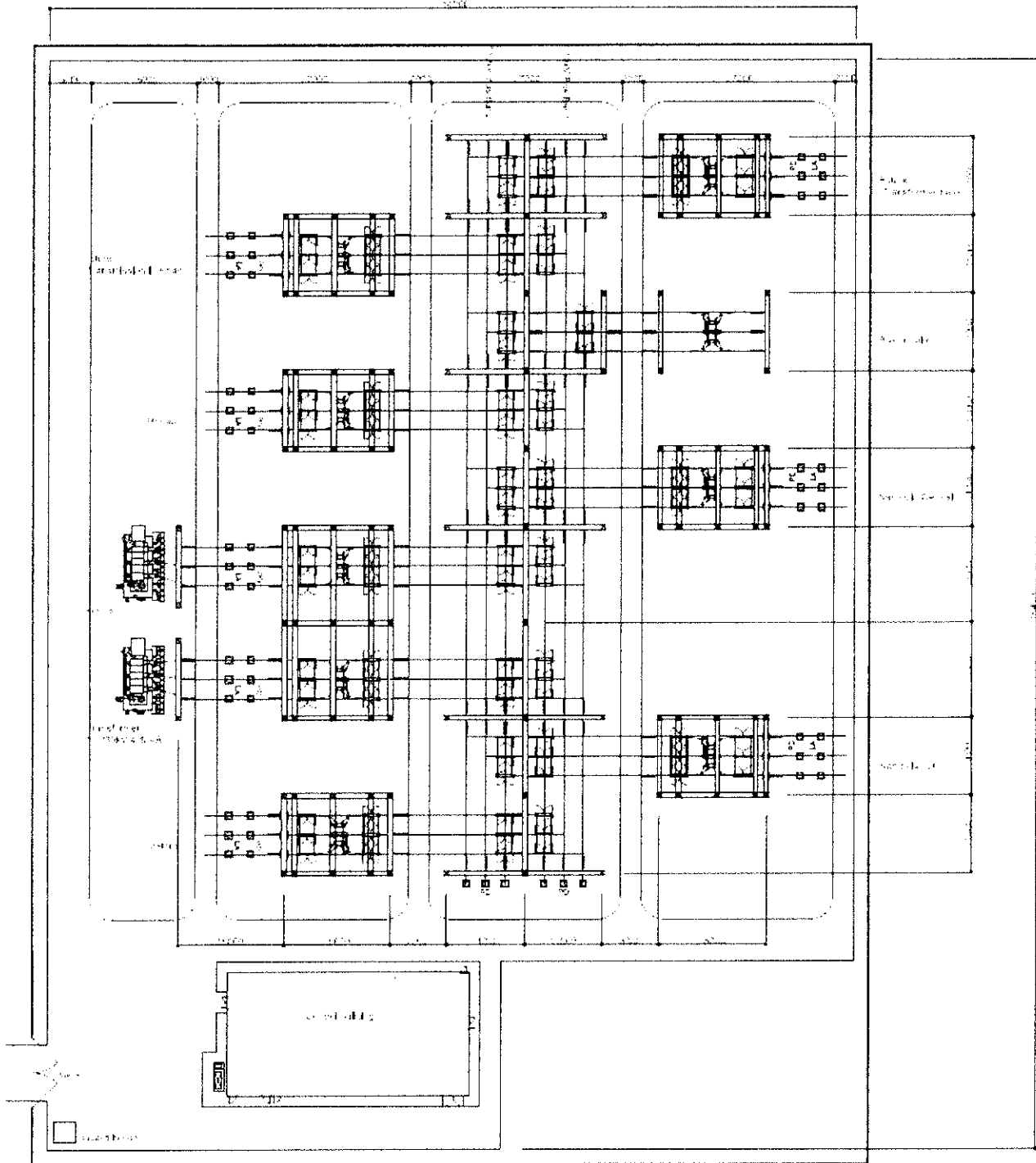
LOCATION OF THE PROJECT SITES



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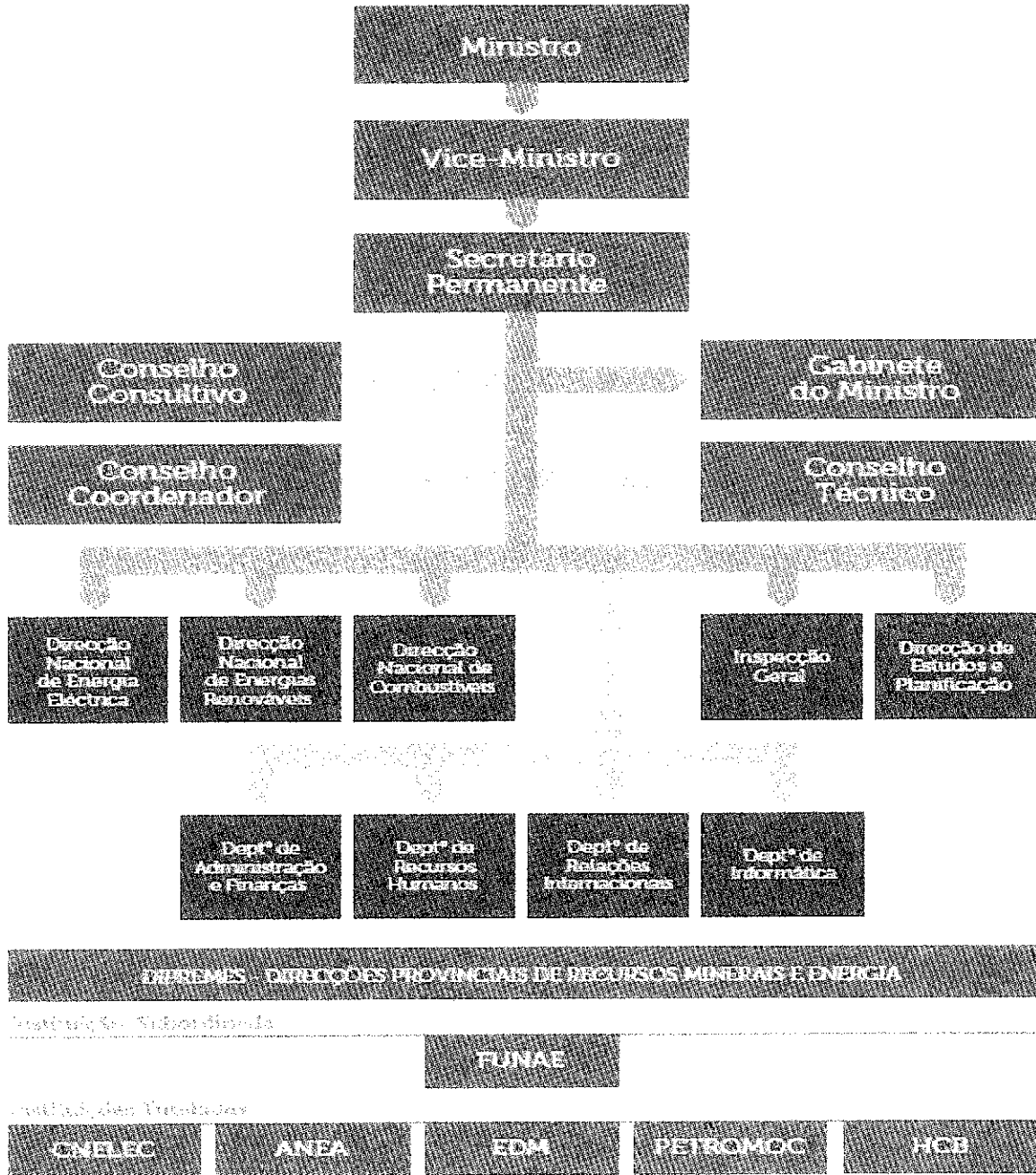


### LAYOUT OF THE PROJECT SITES

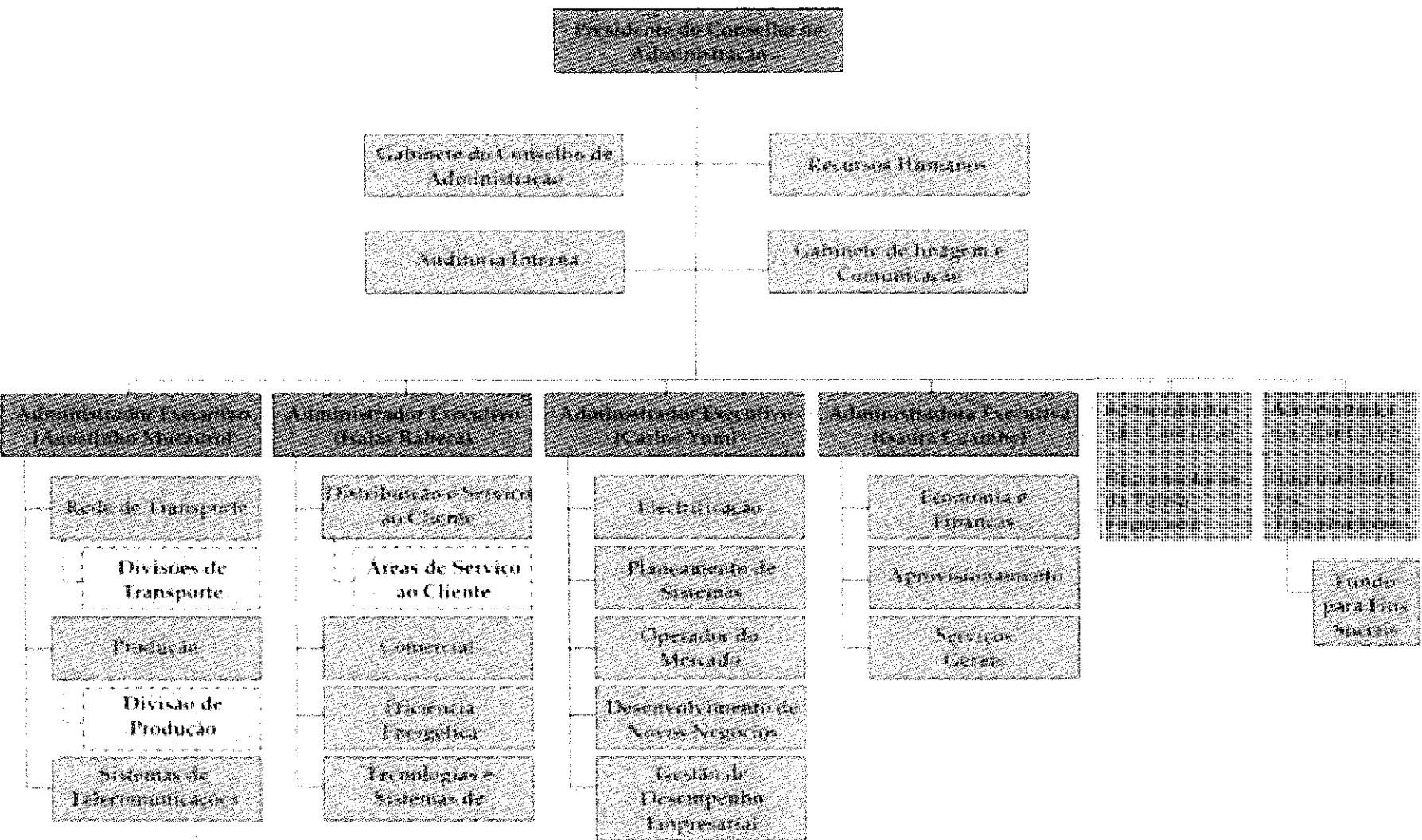


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**ORGANIZATION STRUCTURE OF THE MINISTRY OF ENERGY**



**ORGANIZATION STRUCTURE OF  
ELECTRICIDADE DE MOZAMBIQUE, E.P.**



Annex-4

Details of Project Components Selection

At Project Proposal (Jul 2013) >>>		At the end of 2nd survey (Jun 2014) >>>		At DOD Mission (Jan 2015)				
No.	Component	No.	Component	Remarks	No.	Component	Adoption	Reason of adoption/exclusion
1.	Namialo Substation	1.	Namialo Substation		1.	Namialo Substation		
	110kV Line Bay		110kV Line Bay			110kV Line Bay	Adopted	Adopted since EDM needs the early operation of new Namialo substation.
	110kV Transformer Bay		110kV Transformer Bay			110kV Transformer Bay		
	110kV Switchgear		110kV Switchgear			110kV Switchgear		
	33kV Swithgear		33kV Swithgear			33kV Swithgear		
	33kV Swithgear cubicle		33kV Swithgear cubicle			33kV Swithgear cubicle		
	33kV Feeder control panel		33kV Feeder control panel			33kV Feeder control panel	Excluded	Excluded since it is not indispensable for the operation of new Namialo substation.
	SCADA		SCADA			SCADA	Adopted	Adopted since EDM needs the early operation of new Namialo substation.
2.	Nampula 220 substation (existing)	2.	Nampula 220 substation (existing)		2.	Nampula 220 substation (existing)		
	SCADA		SCADA			SCADA	Adopted	Adopted for the easy operation by EDM
	Necessary rehabilitation of existing distribution panel to install SCADA		Necessary rehabilitation of existing distribution panel to install SCADA			Rehabilitation of existing distribution panel	Excluded	Excluded since it is not indispensable for the operation of new Namialo substation.
3.	Nampula central substation (existing)	3.	Nampula central substation (existing)		3.	Nampula central substation (existing)		
	SCADA		SCADA			SCADA	Adopted	Adopted for the easy operation by EDM
	Rehabilitation of existing distribution panel		Rehabilitation of existing distribution panel			Rehabilitation of existing distribution panel	Excluded	Excluded since it is not indispensable for the operation of new Namialo substation.
		4.	Building (Control building and Guard house)	Proposed by JICA due to its necessity	4.	Building (Control building and Guard house)	Adopted	Adopted since it is indispensable for the operation of new Namialo substation.
		5.	Distribution transformers for non-electrified community along Nacala corridor (10 units)	Proposed by JICA in consideration of the contribution to non-electrified communities	5.	Distribution transformers for non-electrified community along Nacala corridor (3 units for 2 communities)	Reduced	Adopted but numbers of transformers are reduced due to budgetary limitation.
		6.	PLC · Namialo <-> Nampula central · Nampula central <-> Nampula 220 · Namialo <-> Nampula 220 · Namialo <-> Monapo · Namialo <-> Metoro	Requested by EDM	6.	PLC · Namialo <-> Nampula central · Nampula central <-> Nampula 220	Adopted	Adopted but the following lines are excluded from the project since it is not indispensable for the SCADA system · Namialo <-> Nampula 220 · Namialo <-> Monapo · Namialo <-> Metoro
		7.	New transmission tower and cable	Requested by EDM	7.	New transmission tower and cable	Adopted	Adopted since it is indispensable for the operation of new Namialo substation.
		8.	Emergency generator	Requested by EDM	8.	Emergency generator	Adopted	Adopted since it is indispensable for the operation of new Namialo substation.
	Estimated Project Cost		Estimated Project Cost			Estimated Project Cost		
	¥2,273,572,000		¥3,121,824,000			¥1,893,049,000		
	: Additional component requested by EDM		: Additional component proposed by JICA			: Component excluded from the Project after sorting out by the consultant in consideration of its necessity and budgetary limitation.		

AA-2-12

## JAPAN'S GRANT AID

Based on the new JICA law entered into effect on October 1, 2008, JICA is designated as the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and 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. The Grant Aid is not supplied through the donation of materials as such.

### 70. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal & Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A" )
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

### 2. Preparatory Survey

#### (1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document 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 country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme 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 a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever 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 organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

#### (2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered 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 appropriateness of the Project.

### 3. Japan's Grant Aid Scheme

#### (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 country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such

as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) 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 country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex-8.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

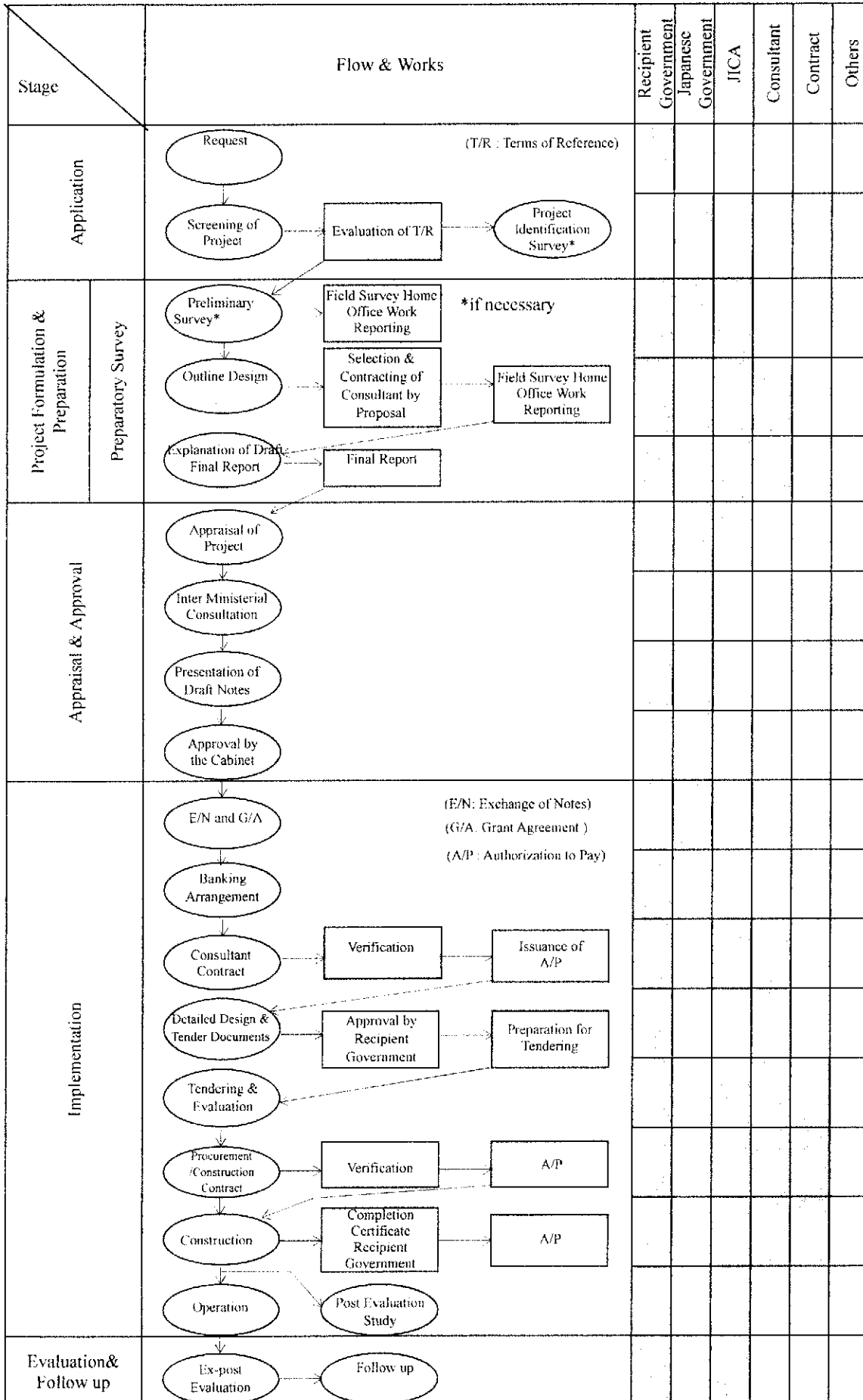
(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

(End)



**FLOW CHART OF JAPAN'S GRANT AID PROCEDURES**



### Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
<b>For The Construction of New Namialo Substation</b>			
1	To secure land (Project site, Temporary yard and etc.)		•
2	To compensate against farming and fruit trees		•
3	To clear, level and reclaim the site when needed		•
4	To certify that the project area is free from mines		•
5	To approve the contract with Japanese consultant and contractor (by CREE)		•
6	To construct new substation		
	1) 110kV switchgears, bus and steel structures	•	
	2) 110kV/33kV Transformer	•	
	3) 33kV feeder switchgears	•	
	4) Protection relaying for both 110kV and 33kV equipment	•	
	5) Substation control board	•	
	6) Power and control cable and auxiliary devices including in-house power supply transformer	•	
	7) Power and control cable and auxiliary devices	•	
	8) Substation ground grid construction	•	
	9) 110kV transmission tower reinforcement	•	
	10) 110kV new transmission tower construction and connection to substation	•	
	11) 33kV cables connection from substation to distribution lines	•	
	12) Disposal of removed existing tower, line conductor and insulators		•
7	To construct the following facilities		
	1) The buildings	•	
	2) The gates and fences in and around the site		•
	3) The parking lot	•	
	4) The road within the site	•	
	5) The permanent access road to the site		•
	6) The railway crossing for the access road		•
	7) The temporary access road to the site for the construction activities	•	
8	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the sites		
	1) Electricity		
	a. The distributing power line to the site	•	
	b. The drop wiring and internal wiring within the site	•	
	c. The main circuit breaker and transformer	•	
	2) Water Supply		
	a. The city water supply for the operation of substation		•
	b. The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)	N/A	N/A
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	•	
	4) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b. The MDF and the extension after the frame/panel	•	
	5) Furniture and Equipment		
	a. General furniture		•
	b. Project equipment	•	
<b>For The Rehabilitation of Existing Substations (Nampula 220 &amp; Nampula Central)</b>			
9	To rehabilitate existing substations		
	1) Replacement of switching board and relaying to be renewed		•
	2) Control cable connection and testing	•	
	3) Disposal of removed equipment and cables		•
<b>For The Provision of SCADA at New Namialo Substation and Existing Nampula 220 &amp; Nampula Central Substation</b>			
10	To construct new SCADA system		
	1) Installation of new SCADA	•	
	2) Installation of RTU and control cable connection	•	
	3) Remote signal testing between SCADA and RTU	•	

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
	4) Tele-communication lines for SCADA	•	
	5) Data preparation for supervisory alarms and metering, and control		•
	6) Implementation of supervisory and control data	•	
For The Provision of Pole Transformer to Non-Electrified Area			
11	To provide pole transformer		
	1) MV/LV pole mounted transformers	•	
	2) Related equipment (lightning arresters, dropout fuses, cross arms, connectors, lead wire, etc)	•	
	3) Installation of transformers and all related equipment	•	
Common For All Components			
12	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the products from Japan to the recipient country	•	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		•
	3) Internal transportation from the port of disembarkation to the Project site	•	
13	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted / be borne by the Authority without using the Grant		•
14	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		•
15	To ensure that the facilities and equipment be maintained and used properly and effectively for the implementation of the Project		•
16	To give due environmental and social consideration in the implementation of the Project		•
17	To bear all the expenses, other than those covered by the Grant, necessary for implementation of the Project		•
18	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		•
	2) Payment commission		•

(B/A : Banking Arrangement, A/P : Authorization to pay)

**(Confidential)**  
**Estimated Project Cost**

The cost of the Project will be approximately JPY 2,105 million in total. The content of the Project cost are shown separately for the Japanese borne portion and the Mozambique side borne portion in accordance with the conditions in item 3. (3) below.

This cost estimate is provisional and subject to change as a result of examination by the Government of Japan for the approval of the Grant.

1. Cost to be borne by the Japanese side: Approximately JPY 1,893 million

Approximate Total cost for Japanese Portion

Cost Items	Approximate Cost (million JPY)
Equipment and materials Procurement Cost (Including costs for Installation works, Ocean & inland Transportation, all insurance, On the Job Training, other works necessary to complete the Project)	JPY 1,613 million
Construction Cost (Including costs for Civil & building works, Temporary works)	JPY 177 million
Detailed Design & Consultant's Supervision	JPY 103 million
Total	JPY 1,893 million

2. Cost to be borne by the Mozambique side: US\$ 530,500 (=approximately JPY54.8 million)

Cost Items	US\$	(≒JP¥)
1. Clearance and levelling of the Project site and access road	US\$ 14,500-	JP¥ 1,500,000 -
2. Land use compensation	US\$ 38,800-	JP¥ 4,000,000-
3. Construction of railway crossing	US\$ 9,700-	JP¥ 1,000,000-
4. Construction of gate and fence	US\$ 87,200-	JP¥ 9,000,000-
5. Structural examination and reinforcement of existing transmission towers	US\$ 58,100-	JP¥ 6,000,000-
6. Disposal of demolished transmission tower materials	US\$ 9,700-	JP¥ 1,000,000-
7. Construction of 33kV distribution lines	US\$ 96,900-	JP¥ 10,000,000-
8. Installation of LV lines and related equipment	US\$ 96,900-	JP¥ 10,000,000-
9. Provision of general furniture	US\$ 7,300-	JP¥ 750,000-
10. Commissions of bank for A/P and payment	US\$ 24,200-	JP¥ 2,500,000-
11. Preparation of permanent access road	US\$ 87,200	JP¥ 9,000,000
Approximate Total cost	US\$ 530,500-	JP¥ 54,750,000-

3. Conditions for estimation

(1) Time of estimation: June 2014

(2) Foreign exchange rates:

1USD = JPY103.22 (TTS mean value from March 2014 to May 2014)

(3) Others:

The above estimation was carried out in accordance with relevant rules and the guideline of the Japanese Grant Aid.

## Environmental Checklist

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? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (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?	(a) Y (b) Y (c) N (d) Y	(a) EIA Study was approved as overall component of much large-scale NORCONSULT F/S study by MICOA as per the official letter (No.138/GM/MICOA/13 to EDM) dated 6 December 2013. (b) As of above the EIA study has already been approved. Also for this project with some modification like slight relocation of the substation and new access road it has already been confirmed by MICOA (Letter No. 826/MICOA/DNAIA/180/14 dated 12 June 2014 to EDM) that no additional official environmental clearance is required since this project (Namialo SS with access road) is located within the area of influence of the approved EIA study in December 2013 for NORCONSULT F/S. (c) Resettlement Plan was recommended for revision as it was regarded as rather preliminary though this aspect is not relevant since no population resettlement is involved for this Namialo SS Project. (d) No other additional permit is required.
	(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 stakeholders? (h) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Stakeholder consultation and related agreement was obtained as component of approved EIA study for NORCONSULT F/S. Additionally, a public participation meeting was performed at Meconta District (on August 22, 2014) with the aim of presenting the project, potential impacts and recommended mitigation measures. The meeting followed the requirements regarding dissemination and procedures for presentation and inclusion of interested and affected parties. (b) The issues raised during the public participation meeting dealt mainly with the project set up and initiation, the benefits it will bring to the population of Meconta and hiring local labor. Issues that would result in the need to change the design of the project were not raised.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Analysis of alternatives was performed, particularly regarding the location of the project substation, and as to the condition of not implementing the project. Concerning the analysis of an alternative location, an alternative site was initially chosen under the scope of the Feasibility Study on Chimuara-Nacala Transmission Project (2013), approximately 800 meters from the current Namialo site; this alternative site was less advantageous than the current Namialo site due to erosion potential, closer proximity to a village and higher potential for economic relocation. The "no action" alternative was analyzed in the light of the increased demand for electric power in the coming years, the needs for expanding the access to stable electrical power of good quality to more households and new industries in the Northern region and the restrictions that such alternative imposes (given the use and requirements by other countries in the region using the Cahora Bassa electric power). It was concluded that within such context the implementation of the Namialo substation is crucial.
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?	(a) N	(a) In consideration to the flat topography of the area and no surface water bodies like rivers in its vicinity no adverse effects on water quality is 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?	(a) N	(a) There are no protected/ecologically significant areas in project area and its vicinity.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? (d) Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife and livestock? (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 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?	(a) N (b) N (c) - (d) - (e) N (f) N	(a) No. The project site is basically barren/open flat land. (b) No. Project site does not encompass habitats of protected/endangered species. (c) No significant ecological impacts is anticipated (d) The project site is located at existing power transmission line (route) and no effect on migration is anticipated. (e) No such effect is anticipated since the project site is located at existing power transmission line. (f) Project area though rather undeveloped has high anthropogenic (human) influence to result in extensive loss in natural environmental resources (Project site located along existing power transmission line).
3 Natural Environment	(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? (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? (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?	(a) N (b) N (c) N	(a) The topography is flat land. So there is no potential for slope failure or landslide. (h) No large-scale cutting and filling works is involved. (c) No significant waste, soil and other run-off is anticipated. Still, construction contractor shall take necessary measures as appropriate as overall EHS (environment, health safety) measures to realize good construction practice.
4 Social Environment	(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? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Are the compensations going to be paid prior to the resettlement? (e) Are the compensation policies prepared in document? (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? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement	(a) N (b) Y (c) Y (d) Y (e) Y (f) Y (g) N (h) Y (i) Y (j) Y	(a) No resettlement of population is required since both project site and access road are located in an area with no human settlements. However, the area is characterized by small plots of farmland (machambas) where the local community cultivates, mostly subsistence agriculture. Therefore, economic displacement of Project Affected Persons (PAP) is expected (19 households/HHs), involving losses of income and/or means of livelihood The implementation of a Simplified Land Use Compensation Plan (SLUCP) was proposed to address the social impacts of the project and to ensure successful restoration and improvement of the living standards, income earning capacity and production levels of PAPs.  (b) Adequate explanation to affected subsistence farmers for relocation of their farms and compensation for losses is assured by the SLUCP. The implementation of the SLUCP shall be pursued by EDM in cooperation with Nampula Provincial Government, Nampula District Administration, Nampula Provincial Directorate of Agriculture, Nampula Provincial Services of Geography and Cadastre as well as

	<p>resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	<p>with the Traditional Authorities. Among others, these entities should ensure that PAPs are well informed at each stage of the process, including procedures and time frames for displacement and compensation, as well as aware of their rights and obligations. On the other hand, during socio-economic field survey, the survey team had already made a short report on the project and its impacts to the secretary of the affected area and the secretary of the nearest area and interviews were conducted to assess the prevailing socioeconomic conditions and to obtain further detailed information on their opinion with regards to the project, displacement and income restoration.</p> <p>(c) SLUCP was developed based on a socio-economic survey and data analysis which comprised a census covering 100% of the project affected Household Head (HH) with farming activity within the project area (19 HH in total). The identification of the farmers and land holders inside the project area was made with the help of the traditional authority that joined the socioeconomic team from day one through all stages.</p> <p>(d) No resettlement. Implementation of the SLUCP will begin prior to the constructions works. No construction work will begin until all PAPs have been compensated and farms are relocated from the project site. On other hand, relocation will be undertaken after necessary compensation and assistance have been provided. A total estimated time of 14 month will be required for the implementation of SLUCP. The process of compensation and posterior reallocation will occur within the first 4 months. Additional 10 months will be required for monitoring PAP and ensure that livelihood and income have improved at least to the pre-project standard, by allowing the monitoring to cover at least 2 harvest seasons. Implementation timetable will commence after the final approval of the Simplified Land Use Compensation Plan.</p> <p>(e) The SLUCP embodies an extensive analysis of policies, legal framework and guidelines, both Mozambican and JICA, to be respected and followed. Additionally, the document presents the eligibility criteria, and the entitlement for different types of losses (loss of agricultural land, loss of cropping areas and loss of fruit trees).</p> <p>(f) SLUCP pays special attention to vulnerable groups (elders, young people, the handicapped, the poor, isolated groups and single heads of households), since they are more susceptible to negative impacts of displacement than the rest of the PAPs. The plan states that EDM will support all costs associated with the assistance to vulnerable persons such as transportation, logistics and administration, when required. In addition monitoring actions of the plan implementation should evaluate the impact of project on the socio-economic status of PAP after the displacement and compensation process, whether they are better or worse regarding livelihoods restoration, especially for vulnerable persons.</p> <p>(g) SLUCP defines a set of measures to be adopted in accordance with JICA guidelines and Mozambican legislation. These are pre-defined measures that include certain countervailing duties already defined by law, including the eligibility and entitlement for compensation.</p> <p>(h) No resettlement is involved. Still, SLUCP incorporates an institutional and implementation framework. It was proposed that the implementation of the SLUCP shall be pursued by EDM in cooperation with Nampula Provincial Government, Nampula District Administration, Nampula Provincial Directorate of Agriculture, Nampula Provincial Services of Geography and</p>
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			<p>Cadastre as well as with the Traditional Authorities; the plan defined their respective roles. SLUCP also estimated the total cost for compensating PAP based on the market price.</p> <p>(i) No resettlement is involved. However, the SLUCP indicates that monitoring and evaluation are critical tools in order to assess the overall project performance, particularly regarding PAP livelihood restoration. According to this, EDM, the implementing entity, shall establish an internal monitoring system for collection, analysis and reporting on SLUCP progress. In addition, an independent external monitoring and evaluation agency must be commissioned for monitoring the impact of the SLUCP implementation and periodic evaluation of compensation process and final outcome. The performance indicators will be listed and monitored by means of the above two monitoring mechanisms.</p> <p>(j) The SLUCP establishes and defines Procedures for Grievance Redress Claims. Grievances related to any aspect of the SLUCP will be handled through negotiation aimed at achieving consensus. Complaints will pass through 3 stages before applying to a court of law as a last resort: address the complaint in writing or verbally to traditional leaders which must resolve the dispute within 7 days; if the aggrieved PAP is not satisfied with the decision taken at the first level, must present the complaint to the Compensation Advisory Committee which will communicate the proposed resolution within 10 days; in a last level, when conflicts cannot be resolved informally at the Project level, formal mechanisms will be required and the Provincial Government can be referred to.</p>
(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>(h) 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>	<p>(a)N/ Y (b) Y (c) N (d) -</p> <p>(a) The project site and access road are located in an area with no human settlement. However, the area is characterized by small plots of farmland (machambas) where the local community cultivates, mostly subsistence agriculture. Therefore economic displacement of PAPs is encountered (19HHs), involving losses of income or means of livelihood. As such a Simplified Land Use Compensation Plan (SLUCP) study was carried out to address the social impacts of the project and to ensure successful restoration of the living standards, income earning capacity and production levels of PAPs.</p> <p>In this respect the SLUCP proposed compensation and assistance system for the PAPs that included the following elements:</p> <ul style="list-style-type: none"> <li>- Provision of land for land with same agricultural potential for all farmland losers with paid labor by the affected farm land losers themselves for the preparation of such new farmlands</li> <li>- Monetary compensation for lost crops and fruit trees with each lost fruit tree being replanted with 2 fruit trees (twice replacement of lost fruit trees)</li> <li>- Provision of seeds</li> <li>- Assistance to vulnerable people</li> </ul> <p>(b) The Construction Contractor shall incorporate appropriate mitigation measures to protect its workforce, as a general component of EHS associated with the construction phase.</p> <p>(c) No such effect is regarded as significant since the project site is located along already existing power transmission line (route).</p> <p>(d) No such compensation is regarded as</p>



				necessary since the project site is located along existing power transmission line.
4 Social Environment	(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?	(a) N	(a) There are no heritage related sites in and in the vicinity of the project area.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) No significant effect on landscape is anticipated by the project. It is noted that the project site is traversed by existing transmission power line and is bare flat land.
	(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?	(a) - (b) -	(a) There are no ethnic minorities/indigenous people living in the site or in the vicinity of project area. (b) No effect as of above.
	(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 individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous 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.? (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?	(a) N (b) Y (c) Y (d) Y	(a) EDM as the project proponent/owner shall ensure all such domestic laws are duly followed by the construction contractor. As good construction practice and also to conform to EHS of construction works construction contractor also shall ensure compliance with relevant domestic laws on safe working condition. (b) As overall EHS of construction works construction contractor shall ensure due safety of construction works (good construction practice with due commitment to "Safety First" concept). (c) As of above EHS of contractor shall ensure all tangible safety programs are implemented. (d) As of above construction contractor shall ensure due safety and security of construction site.
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)? (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) Y (b) Y (c) Y	(a) The required management/mitigation measures for construction works were incorporated in the SES study. The study analyzed impacts on soils and topography, air quality, hydrology, production of waste, noise, flora and fauna, landscape, land use, traffic and transportation, public utilities, health, economy and tensions. Since the project site is sparsely populated with vast expanse of uninhabited area, most of the impacts were classified as having low significance. A number of mitigation measures have been recommended for the potential impacts of this phase, whose implementation is the responsibility of the Contractor. Construction Contractor also shall ensure that appropriate processes are used to mitigate adverse environmental effects as a general component of the EHS of construction works. (b) No significant adverse effects on natural environment is anticipated with due compliance by construction contractor on EHS (good construction practice). (c) Same as above.

	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (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?	(a) Y (b) Y (c) Y (d) -	(a) Required monitoring program on tentative basis that covered ambient air quality and noise and vibration was formulated by the SES Study. The proponent will monitor the implementation of monitoring plan. (b) Same as above, the required items, methods, frequencies aspects are incorporated in the monitoring program developed by the SES Study. (c) Monitoring during construction works will be under the responsibility of the construction contractor and supervision of EDM, the cost of which will be incorporated in the overall construction works. No significant monitoring requirement is expected consequent to the operation of the SS with due mitigation measures to control noise/vibration (green area surrounding the SS and/or structural noise control measures as appropriate). (d) EDM as the project proponent/owner shall ensure due reporting system of the monitoring results will be followed during the project implementation.
6 Note	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).	(a) Y	(a) No additional requirement is noted.
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed, (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) Y	(a) There are no significant transboundary or global warming issues for this Namialo SS project.

- 1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).
- 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

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## Environmental Monitoring Form

## Monitoring Plan

Environmental Items	Environmental Parameters/ Monitoring Item	Unit	Mozambique Standards: Decree 18/2004 and supplement 67/2010	Referred International Standards – WB/IFC Guidelines	Remarks (Measurement Point, Frequency, Method)	Responsible Agency	Cost of Monitoring
<b>Construction Phase</b>							
Air Quality	SPM <sub>10</sub>	µgm/m <sub>3</sub>	Not Specified	50 150 Interim Value	· One Sampling Point near the project site and one sampling point 1 km away from the project site · At least once in three months (one every season) – one 24 hr. day sampling · High Volume Dust Sampler may be used	Implementation – Contractor / EDM	5000 USD per set Included in the overall construction cost
	SPM <sub>2.5</sub>	µgm/m <sub>3</sub>	Not Specified	35 75 Interim Value	· One Sampling Point near the project site and one sampling point 1 km away from the project site · At least once in three months (one every season) – one 24 hr. day sampling · High Volume Dust Sampler may be used	Implementation – Contractor / EDM	5000 USD per set Included in the overall construction cost
Noise and vibration	Noise and vibration level	dB	Not Specified	70 (Night-time) 70 (Day-time) (Industrial Area)	100m from the construction site Per Month one 24-hr. day sampling Sound level meter	Implementation – Contractor / EDM	5350 USD per set Included in the overall construction cost
Waste	Solid waste (including demolition waste) Sanitary waste Housekeeping waste	-	-	-	Worksite and camp site (weekly)	Implementation – Contractor / EDM	Included in the overall construction cost
<b>Operation Phase</b>							
Waste	Solid waste and sanitary waste Housekeeping waste of the substation	-	-	-	Substation Worksite (weekly)	Implementation – EDM (North Region)	Included in the overall operation cost

A4-2-25

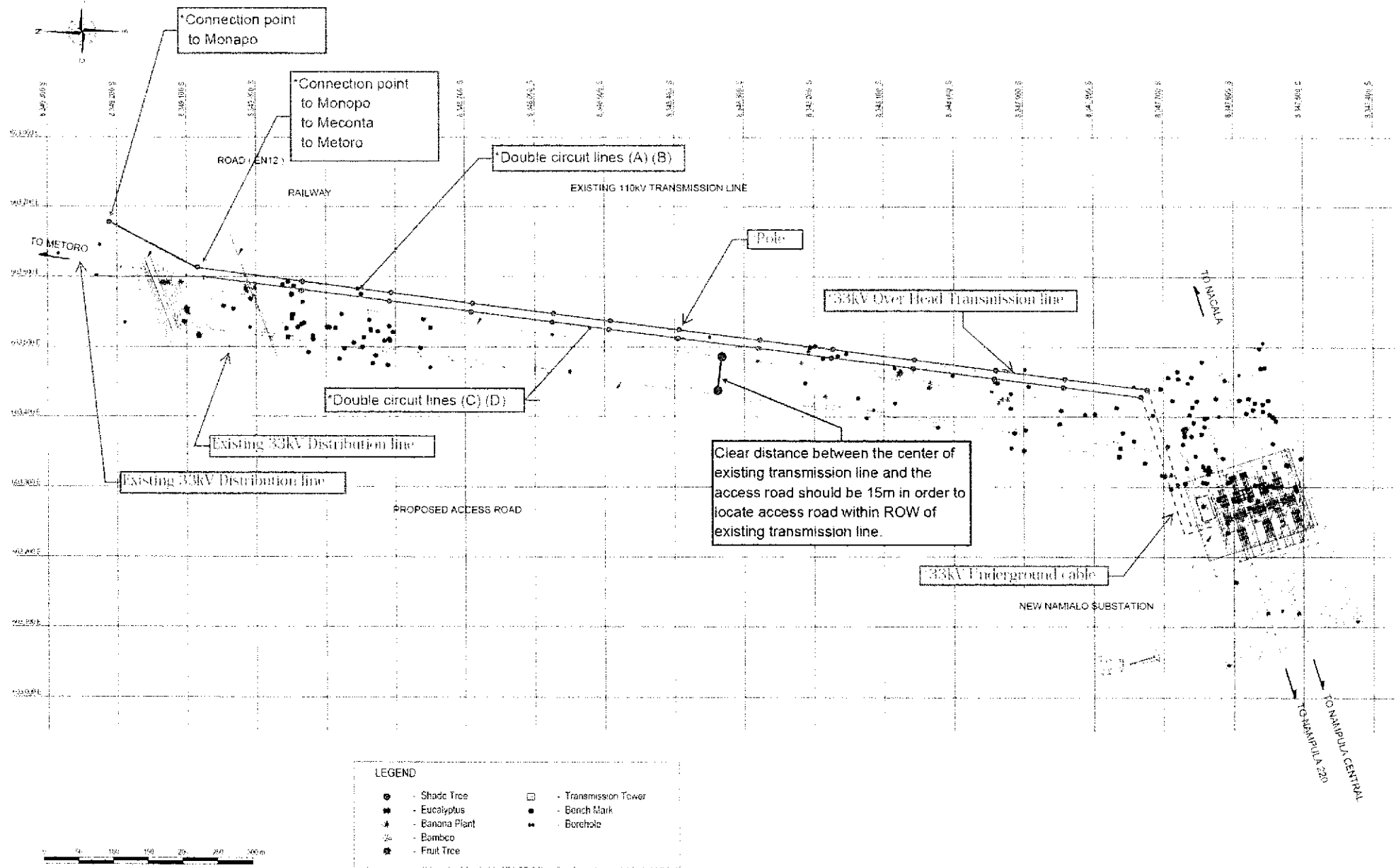
Monitoring Form

Environmental Parameter	Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Mozambique Standards: Decree 18/2004 and supplement 67/2010	Referred International Standards – WB/IFC Guidelines	Remarks (Measurement Point, Frequency, Method)
<b>Construction Phase</b>							
Air Quality	SPM <sub>10</sub>	µgm/m <sup>3</sup>			Not Specified	50 150 Interim Value	One Sampling Point near the project site and one sampling point 1 km away from the project site At least once in three months (one every season) – 24 hr. day sampling High Volume Dust Sampler may be used
	SPM <sub>2.5</sub>	µgm/m <sup>3</sup>			Not Specified	35 75 Interim Value	One Sampling Point near the project site and one sampling point 1 km away from the project site At least once in three months (one every season) – 24 hr. day sampling High Volume Dust Sampler may be used
Noise and vibration	Noise and vibration level	dB			Not Specified	70 (Day-time) 70 (Night-time)	· 100m from the construction site · Per Month one 24-hr. day sampling · Sound level meter
Waste	Solid waste (including demolition waste) Sanitary waste Housekeeping waste						Worksite and camp site (weekly)
<b>Operation Phase</b>							
Waste	Solid waste and sanitary waste Housekeeping waste of the substation						Substation Worksite (weekly)

A4-2-26

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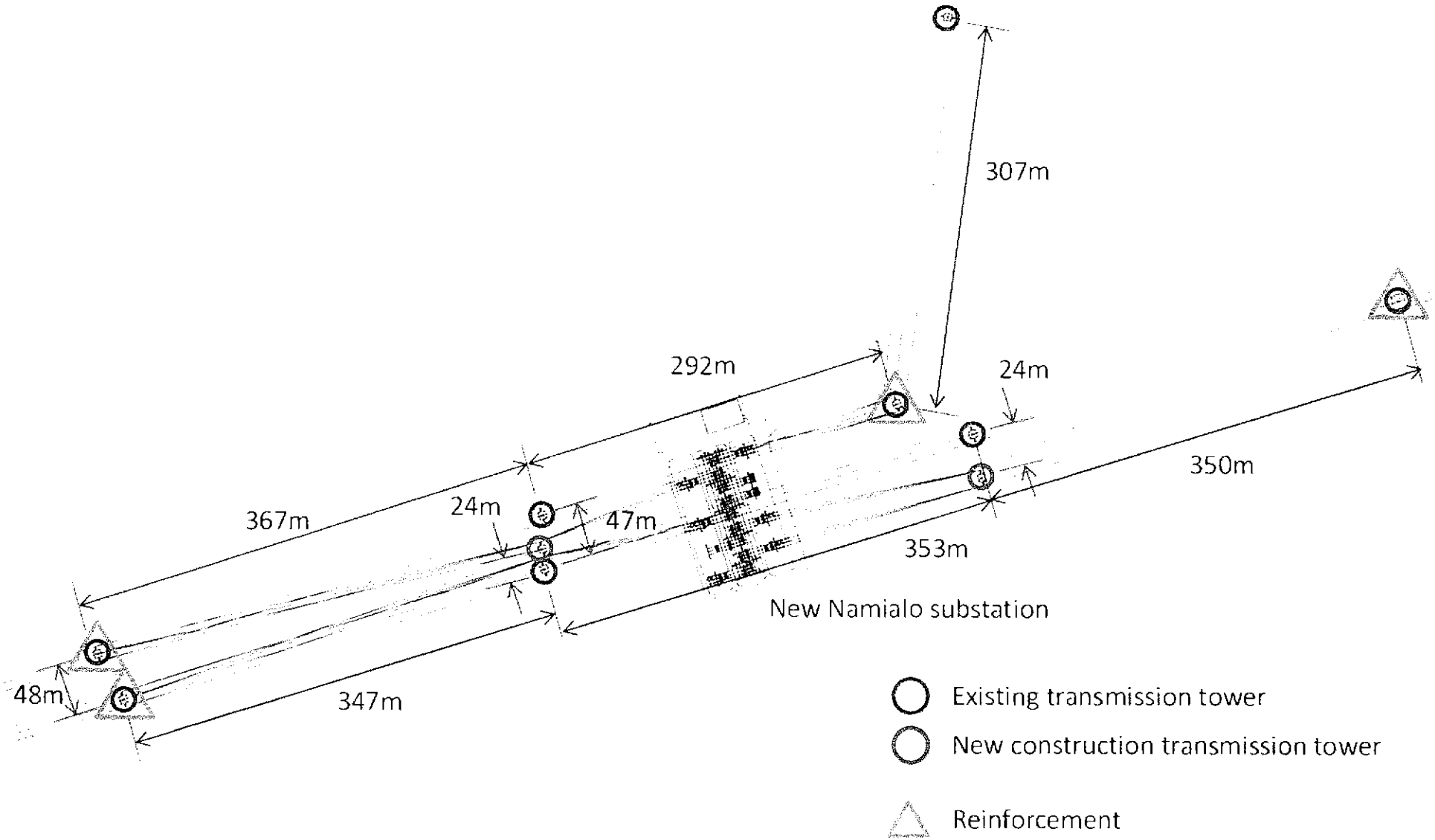
Overview of Layout Plan of Namialo Substation



A4-2-27

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A4-2-28



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Time Flame of Major Undertakings by the Mozambican side

No	Item	Details	2015												2016												2017												Timing		
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		Jul	Aug
<b>General</b>																																									
1.	Tax Exemption	EDM is to ensure that Japanese consultant and contractor shall be exempted from custom duties, internal taxes and other fiscal levies.																																					Through the project period		
2.	Commissions to Bank	EDM is to bear the following commissions paid to Japanese bank for banking services based upon the Banking Arrangement( B/A).																																					Through the project period		
<b>Preparatory Stage</b>																																									
1.	Land Acquisition	EDM is to acquire the land if the project site and access road go beyond the Right of Way (ROW) of existing 110kV transmission lines.																																					Prior to the "Invitation to Tender"		
2.	Site clearance	EDM is clear and level the construction site and access route from EN12 to the site.																																					Prior to the "Invitation to Tender"		
3.	Clearance of Mines	EDM is certify that the construction site and access route are free from Mines. It would be confirmed by the Map of Mines by IMD.																																					Between G/A and "Invitation to Tender"		
4.	Compensation for land use	EDM is to compensate for the people cropping within the construction site and access route.																																					Between G/A and "Invitation to Tender"		
5.	Construction of gate and boundary wall	EDM is to construct the gate and wall of new Namialo substation.																																					Between "Contract with Consultant" and "Contract with Contractor"		
6.	Construction of railroad crossing	EDM is to construct the railroad crossing in order to secure the access from EN12 to site. <i>*EDM is to perform the work required to ensure the offset distance from existing 33kV distribution lines when containers and main transformers are brought in.</i>																																					Between G/A and "Invitation to Tender"		
7.	Approval of contracts for Consultant and Contractor by CREE	EDM is to ensure that the contract with Japanese Consultant and Contractor shall be approved by CREE without any delay.																																					2 months before the contract		
<b>Construction Stage</b>																																									
8.	Structural examination and reinforcement for existing transmission tower	EDM is to carry out the structural examination and reinforcement of existing transmission towers adjacent to new transmission towers.																																					Between "Invitation to Tender" (finalization of detail design) and "Contract with Contractor"		
9.	Disposal of removed transmission tower materials	EDM is to dispose removed materials after the demolition of existing transmission towers.																																					After the demolition of existing transmission towers		
10.	Installation of LV distribution lines other than those covered by the Grant Aid	EDM is to install the LV distribution lines other than those covered by the Grant Aid in "Poste de Secretariado de 25 de Setembro" and "Muxaleque" with related equipment																																					To be completed by the commencement of the operation of Namialo substation		
11.	Construction of permanent access road	EDM is to construct and maintain the permanent access road.																																					EDM may start the construction of permanent access road during construction period in coordination with the contractor.		
12.	Provision of the general furniture	EDM is to provide the general furniture necessary for the operation of new Namialo substation.																																					Between "Completion of Control Bldg." and "H/O of the Project".		
13.	Water supply for the operation of new Namialo substation	EDM is to provide water supply for the operation of new Namialo substation.																																					After the commencement of new Namialo substation		

Note:  
 PLC required for SCADA system (Namialo - Nampula Central & Nampula Central - Nampula 220) will be provided by Japan side, and PLC not required for SCADA system (Namialo - Nampula 220, Namialo - Monapo and Namialo - Metoro) should be provided by EDM. However, it is not considered as "undertakings by EDM" for this project, since it is not directly related to the operation of Namialo substation.

A4-2-29

## 5. 環境影響評価承認に係る MICOA からのレター





REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO PARA A COORDENAÇÃO DA ACÇÃO AMBIENTAL  
DIRECÇÃO NACIONAL DE AVALIAÇÃO DO IMPACTO AMBIENTAL  
DNAIA

À:  
EDM

Maputo

Nossa referência N<sup>o</sup> 26 /MICOA/DNAIA/180/14

Data: 12-06-2014

**Assunto: Projecto de Transporte de Energia Chimuara – Nacala / Alteração do local da Subestação 400/220/110 Kv de Namialo**

Exmos Senhores,

A DNAIA recebeu de V.Excias o pedido de alteração do local inicialmente proposto para a construção da Subestação de Namialo para um novo local, por forma a capitalizar as infra-estruturas existentes e respectiva minimização de impactos sobre o meio ambiente. Da análise dos antecedentes do projecto e da visita ao novo local, efectuada pela Direcção Provincial para a Coordenação da Acção Ambiental de Nampula, somos de parecer favorável à alteração do local tendo em conta que os impactos ambientais identificados são abrangentes, e não existem pessoas e benfeitorias a serem afectadas.

Com os melhores cumprimentos.



C.C: DPCA-Nampula

## 6. 農作物補償額一覽表

REPUBLIC OF MOZAMBIQUE

Nampula Provincial Government

Provincial Directorate of Agriculture

**Prices of food crops compensation for loss of harvest (MZM)**

1. Fruit Trees

Plants	Each new plant	Each plant at reproductive stage	Old plant (does not reproduce and dry)
Cashew Tree	1,000.00	1,250.00	500.00
Mango Tree	300.00	400.00	150.00
Banana Tree	150	200.00	100.00
Citrus	500.00	750.00	300.00
Lychee Tree	1,100.00	1,500.00	700.00
Jackfruit Tree	250.00	500.00	200.00
Pear/Avocado Tree	500.00	750.00	300.00
Pawpaw Tree	300.00	600.00	200.00
Coconut Tree	1,000.00	1,500.00	500.00
Guava Tree	500.00	750.00	300.00
Starfruit Tree	500.00	750.00	300.00
Sugar Apple Tree	300.00	600.00	200.00
Climbing Fruit Plants	300.00	600.00	200.00
Vine or Grape Tree	350.00	750.00	250.00
Peach Tree	500.00	900.00	400.00
Pineapple Tree	25.00	50.00	15.00
Strawberry Tree*	50.00	100.00	30.00

\*Cost evaluated per square meter (m<sup>2</sup>)

## 2. Cereals and Oilseeds

Harvest	Per square meter (m <sup>2</sup> )
Rice	20.00
Maize	25.00
Sorghum	25.00
Peanut	30.00
Sesame	35.00
Beans	20.00
French Beans	25.00
Sunflower	35.00
Castor	25.00

## 2. Vegetables

Harvest	Per square meter (m2)
Cabbage ( <i>brassica oleracea var. Capitata</i> ), carrot, eggplant, tomato, okra, squash, onion, garlic, pepper, cabagge ( <i>brassica carinata</i> ), lettuce, cucumber, beet, african spinach or amaranthus, spinach, other	50.00

## 3. Roots and Tubers

Harvest	Each stack (Root)	Each stack (Tubers)
Cassava	5.00	20.00
Sweet Potato*	15.00	
Potato*	40.00	
Yam	10.00	15.00

\*Cost evaluated per square meter (m2)

#### 4. Other crops

<b>Harvest</b>	<b>Per square meter (m2)</b>
Tobacco	15.00
Sisal	50.00
Sugar cane*	15.00
Cotton	7.50
Eucalyptus**	missing in original

\*cost evaluated per stack

\*\*cost evaluated per plant

Nampula, 06<sup>th</sup> February 2014

The Provincial Director

Pedro Daniel Dzucule

(M.A. in Development Management)

## 7. 損失財産インベントリー

## 損失財産インベントリー

HH Code	HH Name	Farmland (ID Code)	Farmland area (m2)	Farmland Status	Crop	N° of Cassava	Crop Price (MZM)	Total Crop Value (MZM)	Type of Fruit Tree	N° of Fruit Trees	Fruit Tree Price	Total Fruit Tree Value (MZM)	Total Valuation	
1	Marquita Emilio		1	1440	Cultivated	Cassava	4	5	20	Banana	169	150	25350	
			2	3456	Fallow					Cashew	12	1000	12000	
			3	1240	Fallow									
			4	1558	Fallow									
			5	1085	Fallow									
			6	5135	Fallow									
			7	2550	Fallow									
			8	136	Cultivated	Cassava	7	5	35					
		10	2500	Fallow										
		<b>Sub-Total</b>	<b>9</b>	<b>19100</b>				<b>55</b>				<b>37350</b>	<b>37405</b>	
2	Maria Seleque Muquiquire		9A	5900	Fallow					Cashew	2	1000	2000	
			9B	713	Fallow									
			9C	3900	Cultivated	Cassava	43	5	215					
			9D	2655	Cultivated	Cassava	20	5	100					
			<b>Sub-Total</b>	<b>4</b>	<b>13168</b>			<b>63</b>		<b>315</b>			<b>2000</b>	
3	Alexandre		12	0	Fallow				Cashew	1	1000	1000		

HH Code	HH Name	Farmland (ID Code)		Farmland area (m2)	Farmland Status	Crop	N° of Cassava	Crop Price (MZM)	Total Crop Value (MZM)	Type of Fruit Tree	N° of Fruit Trees	Fruit Tree Price	Total Fruit Tree Value (MZM)	Total Valuation
	Puompuela		15	940	Fallow					Mango	6	300	1800	
			16	940	Fallow									
		<b>Sub-Total</b>	<b>3</b>	<b>1880</b>									<b>2800</b>	
4	Rafael Chahano		13A	8500	Fallow					Banana	1	150	150	
			13B	15	Fallow					Cashew	7	1000	7000	
			17	2948	Fallow									
		<b>Sub-Total</b>	<b>3</b>	<b>11463</b>									<b>7150</b>	
5	José Chico		14	0	Fallow					Cashew	6	1000	6000	
			<b>Sub-Total</b>	<b>14</b>										
6	Agostinho Muquamoá		18	575	Cultivated	Cassava	8	5	40	Banana	51	150	7650	
										Cashew	37	1000	37000	
		<b>Sub-Total</b>	<b>1</b>	<b>575</b>			<b>8</b>		<b>40</b>				<b>44650</b>	
7	Fatima Ernesto		19	750	Cultivated	Cassava	54	5	270	Cashew	17	1000	17000	
			20	2356	Cultivated	Cassava	27	5	135	Banana	3	150	450	
		<b>Sub-Total</b>	<b>2</b>	<b>3106</b>			<b>81</b>		<b>405</b>				<b>17450</b>	
8	Amade sabonete		21A	525	Fallow					Cashew	10	1000	10000	
			21B	1050	Fallow									
		<b>Sub-Total</b>	<b>2</b>	<b>1575</b>									<b>10000</b>	
9	Julietta Manuel		22	15000	Fallow					Banana	357	150	53550	



HH Code	HH Name	Farmland (ID Code)		Farmland area (m2)	Farmland Status	Crop	N° of Cassava	Crop Price (MZM)	Total Crop Value (MZM)	Type of Fruit Tree	N° of Fruit Trees	Fruit Tree Price	Total Fruit Tree Value (MZM)	Total Valuation
										Cashew	39	1000	39000	
		<b>Sub-Total</b>	<b>1</b>	<b>15000</b>									<b>92550</b>	<b>92550</b>
10	Mauricio dos Santos		23	329	Fallow									
	Rosario	<b>Sub-Total</b>	<b>1</b>	<b>329</b>									<b>0</b>	
11	Arira Momade		24	0	Fallow					Cashew	6	1000	6000	
		<b>Sub-Total</b>	<b>1</b>	<b>0</b>									<b>6000</b>	<b>6000</b>
12	Francisco Horta		25	1325	Cultivated	Cassava	25	5	125	Cashew	4	1000	4000	
										Pear	1	500	500	
		<b>Sub-Total</b>	<b>1</b>	<b>1325</b>					<b>125</b>				<b>4500</b>	<b>4625</b>
13	Cardoso Manuel		27	3975	Fallow					Mango	19	300	5700	
	Manhaca	<b>Sub-Total</b>	<b>1</b>	<b>3975</b>									<b>5700</b>	<b>5700</b>
14	Rosario Vasco		26	1875	Cultivated	Beans		20	37500	Banana	416	150	62400	
										Cashew	5	1000	5000	
										Mango	2	300	600	
										Guava	4	500	2000	
		<b>Sub-Total</b>	<b>1</b>	<b>1875</b>					<b>37500</b>				<b>70000</b>	<b>37500</b>
15	Fatima João		27	1875	Cultivated	Beans		20	37500	Banana	97	150	14550	
	(Tenant)	<b>Sub-Total</b>	<b>1</b>	<b>1875</b>					<b>37500</b>				<b>14550</b>	<b>52050</b>
16	Arminda Rafael		28	3750	Cultivated	Beans		20	75000	Banana	153	150	22950	

HH Code	HH Name	Farmland (ID Code)		Farmland area (m2)	Farmland Status	Crop	N° of Cassava	Crop Price (MZM)	Total Crop Value (MZM)	Type of Fruit Tree	N° of Fruit Trees	Fruit Tree Price	Total Fruit Tree Value (MZM)	Total Valuation
	(Tenant)									Cashew	3	1000	3000	
										Mango	10	300	3000	
											Papaya	1	300	
		<b>Sub-Total</b>	<b>1</b>	<b>3750</b>					<b>75000</b>				<b>29250</b>	<b>104250</b>
17	João Martins Alberto		29	9000	Fallow					Cashew	6	1000	6000	
										Mango	2	300	600	
		<b>Sub-Total</b>	<b>1</b>	<b>9000</b>									<b>6600</b>	<b>6600</b>
18	Fernando Selemane		30	675	Fallow					Banana	247	150	37050	
										Cashew	1	1000	1000	
											Mango	1	300	
		<b>Sub-Total</b>	<b>1</b>	<b>675</b>									<b>38350</b>	<b>38350</b>
19	Elisa Megila		31	9000	Cultivated	Cassava	15	5	75	Banana	4	150	600	
											Cashew	8	1000	
		<b>Sub-Total</b>	<b>1</b>	<b>9000</b>				<b>15</b>		<b>75</b>			<b>8600</b>	<b>8675</b>
		<b>Total</b>		<b>97 671</b>					<b>151 015</b>				<b>403 500</b>	<b>554 515</b>

## 8. 簡易用地補償内部モニタリングフォーム

簡易用地補償内部モニタリングフォーム SLUCP

N	Monitoring Indicators	Unit	Monthly Progress (N°)	Monthly Progress (% of the total)	Cumulative Achievement (N°)	Cumulative Achievement (% of the total)
<b>1. Displacement Preparation</b>						
1	Identification of PAP	N°				
2	N° of HH signatures for Compensation contracts	N°				
3	N° of HH with bank account	N°				
4	Identification of farmlands	N°				
5	Identification of Fruit Trees	N°				
6	Identification of Crops	N°				
7	N° of Meeting with PAP	N°				
<b>2. Delivery on Compensation</b>						
1	N° of PAP replaced	N°				
2	Size of farmland allocated	Ha				
3	N° of farmland plots allocated	N°				
4	N° of fruit trees replaced	N°				
5	N° of HH that received seeds assistance	N°				
6	N° of HH-VP that received assistance	N°				
7	Amount of Compensation on Land preparation	MZ M				
8	Amount of Compensation on Crops	MZ M				
9	Amount of Compensation on Fruit Trees	MZ M				
10	Amount of Compensation on Seed	MZ M				
11	Amount of assistance to HH-VP	MZ M				
<b>3. Public Consultation including Grievance Redress</b>						
1	N° of compensation and reallocation meetings	N°				
2	N° of Grievance redress procedures filed	N°				
3	N° of Grievance resolved	N°				

## 9. 簡易用地補償外部モニタリングフォーム

簡易用地補償外部モニタリングフォーム

Relocation Activities	Planned Total	Unit	Progress in Quantity			Progress in %		Expected Date of Completion	Responsible Organization
			During the quarter	Till the last quarter	Up to the quarter	Till the last quarter	Up to the quarter		
Preparation of SLUCP									
Employment of Consultants		Month							
Implementation of Census Survey (Including Socio Economic Survey)									
Approval of SLUCP			Date of Approval						
Finalization of PAPs List		No of PAPs							
Progress of Compensation payment		No of HHs							
Lot 1 (Land)		No of							

Relocation Activities	Planned Total	Unit	Progress in Quantity			Progress in %		Expected Date of Completion	Responsible Organization
			During the quarter	Till the last quarter	Up to the quarter	Till the last quarter	Up to the quarter		
		HHs							
Lot 2 (Crop)		No of HHs							
Lot 3 (Trees)		No of HHs							
Lot 4 (Seeds)		No of HHs							
Lot 5 (VP)		No of HHs							
Progress of Land Acquisition (All Lots)		m <sup>2</sup>							
Progress of Asset Replacement (All lots):		No of HHs							
Lot 1 (Land)		No of HHs							
Lot 2 (Crop)		No of							

Relocation Activities	Planned Total	Unit	Progress in Quantity			Progress in %		Expected Date of Completion	Responsible Organization
			During the quarter	Till the last quarter	Up to the quarter	Till the last quarter	Up to the quarter		
		HHs							
Lot 3 (Trees)		No of HHs							
Lot 4 (Seeds)		No of HHs							
Lot 5 (VP)		No of HHs							



## 10. 指標別モニタリングフォーム

指標別モニタリングフォーム

Serial	Monitoring Item/Indicator	Report Period			
		Month-1	Month-2	Month-3	-----
1	Amicable Negotiation (Total 100%) Cumulative progress				
2	Successful grievance resolution (No.) Cumulative progress				
3	Timely delivery of Compensation (in MZM) Cumulative progress				
4	Satisfied with agreed relocation (No. of PAPs) Cumulative progress				
5	Restoration of economic/agricultural activities (No. of PAPs) Cumulative progress				
6	No of occupational disruption and major damages (No. of PAPs) Cumulative Figure				
7	Land prepared for compensation Cumulative Figure				
8	Trees provided for compensation Cumulative Figure				
9	Seed provided to PAPs Cumulative Figure				
10	Enhanced livelihood through effective use of compensation (No. of PAPs) Cumulative progress				
11	Assistance provided to Vulnerable Persons -In MZM -No. PAPs				

## 1 1. 環境チェックリスト

環境チェックリスト

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? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (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?	(a) Y (b) Y (c) N (d) Y	(a) EIA Study was approved as overall component of much large-scale NORCONSULT F/S study by MICOA as per the official letter (No.138/GM/MICOA/13 to EDM) dated 6 December 2013. (b) As of above the EIA study has already been approved. Also for this project with some modification like slight relocation of the substation and new access road it has already been confirmed by MICOA (Letter No. 826/MICOA/DNAIA/180/14 dated 12 June 2014 to EDM) that no additional official environmental clearance is required since this project (Namialo SS with access road) is located within the area of influence of the approved EIA study in December 2013 for NORCONSULT F/S. (c) Resettlement Plan was recommended for revision as it was regarded as rather preliminary though this aspect is not relevant since no population resettlement is involved for this Namialo SS Project. (d) No other additional permit is required.

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	(2) Explanation to the Local Stakeholders	<p>(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 stakeholders?</p> <p>(b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?</p>	<p>(a) Y</p> <p>(b) Y</p>	<p>(a) Stakeholder consultation and related agreement was obtained as component of approved EIA study for NORCONSULT F/S. Additionally, a public participation meeting was performed at Meconta District (on August 22, 2014) with the aim of presenting the project, potential impacts and recommended mitigation measures. The meeting followed the requirements regarding dissemination and procedures for presentation and inclusion of interested and affected parties.</p> <p>(b) The issues raised during the public participation meeting dealt mainly with the project set up and initiation, the benefits it will bring to the population of Meconta and hiring local labor. Issues that would result in the need to change the design of the project were not raised.</p>
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Analysis of alternatives was performed, particularly regarding the location of the project substation, and as to the condition of not implementing the project. Concerning the analysis of an alternative location, an alternative site was initially chosen under the scope of the Feasibility Study on Chimuara-Nacala Transmission Project (2013), approximately 800 meters from the current Namialo site; this alternative site was less advantageous than the current Namialo site due to erosion potential, closer proximity to a village and higher potential for economic relocation. The "no action" alternative was analyzed in the light of the increased demand for

				electric power in the coming years, the needs for expanding the access to stable electrical power of good quality to more households and new industries in the Northern region and the restrictions that such alternative imposes (given the use and requirements by other countries in the region using the Cahora Bassa electric power). It was concluded that within such context the implementation of the Namialo substation is crucial.
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?	(a) N	(a) In consideration to the flat topography of the area and no surface water bodies like rivers in its vicinity no adverse effects on water quality is 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?	(a) N	(a) There are no protected/ecologically significant areas in project area and its vicinity.

	(2) Ecosystem	<p>(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</p> <p>(b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</p> <p>(c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</p> <p>(d) Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife and livestock?</p> <p>(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 measures for preventing such impacts considered?</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>	<p>(a) N</p> <p>(b) N</p> <p>(c) -</p> <p>(d) -</p> <p>(e) N</p> <p>(f) N</p>	<p>(a) No. The project site is basically barren/open flat land.</p> <p>(b) No. Project site does not encompass habitats of protected/endangered species.</p> <p>(c) No significant ecological impacts is anticipated</p> <p>(d) The project site is located at existing power transmission line (route) and no effect on migration is anticipated.</p> <p>(e) No such effect is anticipated since the project site is located at existing power transmission line.</p> <p>(f) Project area though rather undeveloped has high anthropogenic (human) influence to result in extensive loss in natural environmental resources (Project site located along existing power transmission line).</p>
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3 Natural Environment	(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 landslides? Are adequate measures considered to prevent slope failures or landslides?</p> <p>(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?</p>	<p>(a) N</p> <p>(b) N</p> <p>(c) N</p>	<p>(a) The topography is flat land. So there is no potential for slope failure or landslide.</p> <p>(b) No large-scale cutting and filling works is involved.</p> <p>(c) No significant waste, soil and other run-off is anticipated. Still, construction contractor shall take necessary measures as appropriate as overall EHS (environment, health safety) measures to realize good construction practice.</p>
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4 Social Environment	(1) Resettlement	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Are the compensations going to be paid prior to the resettlement?</p> <p>(e) Are the compensation policies prepared in document?</p> <p>(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?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of</p>	<p>(a) N (b) Y (c) Y (d) Y (e) Y (f) Y (g) N (h) Y (i) Y (j) Y</p>	<p>(a) No resettlement of population is required since both project site and access road are located in an area with no human settlements. However, the area is characterized by small plots of farmland (machambas) where the local community cultivates, mostly subsistence agriculture. Therefore, economic displacement of Project Affected Persons (PAP) is expected (19 households/HHs), involving losses of income and/or means of livelihood. The implementation of a Simplified Land Use Compensation Plan (SLUCP) was proposed to address the social impacts of the project and to ensure successful restoration and improvement of the living standards, income earning capacity and production levels of PAPs.</p> <p>(b) Adequate explanation to affected subsistence farmers for relocation of their farms and compensation for losses is assured by the SLUCP. The implementation of the SLUCP shall be pursued by EDM in cooperation with Nampula Provincial Government, Meconta District Administration, Nampula Provincial Directorate of Agriculture, Nampula Provincial Services of Geography and Cadastre as well as with the Traditional Authorities. Among others, these entities should ensure that PAPs are well informed at each stage of the process, including procedures and time frames for displacement and compensation, as well as aware of their rights and obligations. On the other hand, during socio-economic field</p>
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		<p>resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	<p>survey, the survey team had already made a short report on the project and its impacts to the secretary of the affected area and the secretary of the nearest area and interviews were conducted to assess the prevailing socioeconomic conditions and to obtain further detailed information on their opinion with regards to the project, displacement and income restoration.</p> <p>(c) SLUCP was developed based on a socio-economic survey and data analysis which comprised a census covering 100% of the project affected Household Head (HH) with farming activity within the project area (19 HH in total). The identification of the farmers and land holders inside the project area was made with the help of the traditional authority that joined the socioeconomic team from day one through all stages.</p> <p>(d) No resettlement. Implementation of the SLUCP will begin prior to the constructions works. No construction work will begin until all PAPs have been compensated and farms are relocated from the project site. On other hand, relocation will be undertaken after necessary compensation and assistance have been provided. A total estimated time of 14 month will be required for the implementation of SLUCP. The process of compensation and posterior reallocation will occur within the first 4 months. Additional 10 months will be required for monitoring PAP and ensure that livelihood and income</p>
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			<p>have improved at least to the pre-project standard, by allowing the monitoring to cover at least 2 harvest seasons. Implementation timetable will commence after the final approval of the Simplified Land Use Compensation Plan.</p> <p>(e) The SLUCP embodies an extensive analysis of policies, legal framework and guidelines, both Mozambican and JICA, to be respected and followed. Additionally, the document presents the eligibility criteria, and the entitlement for different types of losses (loss of agricultural land, loss of cropping areas and loss of fruit trees).</p> <p>(f) SLUCP pays special attention to vulnerable groups (elders, young people, the handicapped, the poor, isolated groups and single heads of households), since they are more susceptible to negative impacts of displacement than the rest of the PAPs. The plan states that EDM will support all costs associated with the assistance to vulnerable persons such as transportation, logistics and administration, when required. In addition monitoring actions of the plan implementation should evaluate the impact of project on the socio-economic status of PAP after the displacement and compensation process, whether they are better or worse regarding livelihoods restoration, especially for vulnerable persons.</p> <p>(g) SLUCP defines a set of measures to be adopted in accordance with JICA guidelines and Mozambican legislation. These are</p>
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			<p>pre-defined measures that include certain countervailing duties already defined by law, including the eligibility and entitlement for compensation.</p> <p>(h) No resettlement is involved. Still, SLUCP incorporates an institutional and implementation framework. It was proposed that the implementation of the SLUCP shall be pursued by EDM in cooperation with Nampula Provincial Government, Meconta District Administration, Nampula Provincial Directorate of Agriculture, Nampula Provincial Services of Geography and Cadastre as well as with the Traditional Authorities; the plan defined their respective roles. SLUCP also estimated the total cost for compensating PAP based on the market price.</p> <p>(i) No resettlement is involved. However, the SLUCP indicates that monitoring and evaluation are critical tools in order to assess the overall project performance, particularly regarding PAP livelihood restoration. According to this, EDM, the implementing entity, shall establish an internal monitoring system for collection, analysis and reporting on SLUCP progress. In addition, an independent external monitoring and evaluation agency must be commissioned for monitoring the impact of the SLUCP implementation and periodic evaluation of compensation process and final outcome. The performance indicators will be listed and monitored by means of</p>
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				<p>the above two monitoring mechanisms.</p> <p>(j) The SLUCP establishes and defines Procedures for Grievance Redress Claims. Grievances related to any aspect of the SLUCP will be handled through negotiation aimed at achieving consensus. Complaints will pass through 3 stages before applying to a court of law as a last resort: address the complaint in writing or verbally to traditional leaders which must resolve the dispute within 7 days; if the aggrieved PAP is not satisfied with the decision taken at the first level, must present the complaint to the Compensation Advisory Committee which will communicate the proposed resolution within 10 days; in a last level, when conflicts cannot be resolved informally at the Project level, formal mechanisms will be required and the Provincial Government can be referred to.</p>
(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</p>	<p>(a)N/Y</p> <p>(b) Y</p> <p>(c) N</p> <p>(d) -</p>	<p>(a) The project site and access road are located in an area with no human settlement. However, the area is characterized by small plots of farmland (machambas) where the local community cultivates, mostly subsistence agriculture. Therefore economic displacement of PAPs is encountered (19HHs), involving losses of income or means of livelihood. As such a Simplified Land Use Compensation Plan (SLUCP) study was carried out to address the</p>	

		<p>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>		<p>social impacts of the project and to ensure successful restoration of the living standards, income earning capacity and production levels of PAPs.</p> <p>In this respect the SLUCP proposed compensation and assistance system for the PAPs that included the following elements:</p> <ul style="list-style-type: none"> <li>- Provision of land for land with same agricultural potential for all farmland losers with paid labor by the affected farm land losers themselves for the preparation of such new farmlands</li> <li>- Monetary compensation for lost crops and fruit trees with each lost fruit tree being replanted with 2 fruit trees (twice replacement of lost fruit trees)</li> <li>- Provision of seeds</li> <li>- Assistance to vulnerable people</li> </ul> <p>(b) The Construction Contractor shall incorporate appropriate mitigation measures to protect its workforce, as a general component of EHS associated with the construction phase.</p> <p>(c) No such effect is regarded as significant since the project site is located along already existing power transmission line (route).</p> <p>(d) No such compensation is regarded as necessary since the project site is located along existing power transmission line.</p>	
4	Social Environment	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are	(a) N	(a) There are no heritage related sites in and in the vicinity of the project area.

		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?	(a) N	(a) No significant effect on landscape is anticipated by the project. It is noted that the project site is traversed by existing transmission power line and is bare flat land.
(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?	(a) - (b) -	(a) There are no ethnic minorities/indigenous people living in the site or in the vicinity of project area. (b) No effect as of above.
(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 individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous 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.? (d) Are appropriate measures taken to ensure that security	(a) N (b) Y (c) Y (d) Y	(a) EDM as the project proponent/owner shall ensure all such domestic laws are duly followed by the construction contractor. As good construction practice and also to conform to EHS of construction works construction contractor also shall ensure compliance with relevant domestic laws on safe working condition. (b) As overall EHS of construction works construction contractor shall ensure due safety of construction works (good construction practice with due commitment to "Safety First" concept). (c) As of above EHS of contractor shall ensure all tangible safety programs are implemented. (d) As of above construction contractor shall ensure due safety and security of construction site.

		guards involved in the project not to violate safety of other individuals involved, or local residents?		
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> <p>(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p>	<p>(a) The required management/mitigation measures for construction works were incorporated in the SES study. The study analyzed impacts on soils and topography, air quality, hydrology, production of waste, noise, flora and fauna, landscape, land use, traffic and transportation, public utilities, health, economy and tensions. Since the project site is sparsely populated with vast expanse of uninhabited area, most of the impacts were classified as having low significance. A number of mitigation measures have been recommended for the potential impacts of this phase, whose implementation is the responsibility of the Contractor. Construction Contractor also shall ensure that appropriate processes are used to mitigate adverse environmental effects as a general component of the EHS of construction works.</p> <p>(b) No significant adverse effects on natural environment is anticipated with due compliance by construction contractor on EHS (good construction practice).</p> <p>(c) Same as above.</p>



	(2) Monitoring	<p>(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <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>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) -</p>	<p>(a) Required monitoring program on tentative basis that covered ambient air quality and noise and vibration was formulated by the SES Study. The proponent will monitor the implementation of monitoring plan.</p> <p>(b) Same as above, the required items, methods, frequencies aspects are incorporated in the monitoring program developed by the SES Study.</p> <p>(c) Monitoring during construction works will be under the responsibility of the construction contractor and supervision of EDM, the cost of which will be incorporated in the overall construction works. No significant monitoring requirement is expected consequent to the operation of the SS with due mitigation measures to control noise/vibration (green area surrounding the SS and/or structural noise control measures as appropriate).</p> <p>(d) EDM as the project proponent/owner shall ensure due reporting system of the monitoring results will be followed during the project implementation.</p>
6 Note	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).	(a) Y	(a) No additional requirement is noted.

	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed, (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) Y	(a) There are no significant transboundary or global warming issues for this Namialo SS project.
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1) Regarding the term “Country’s Standards” mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

## 1 2. 無電化村向配電用変圧器設置コミュニティ選定経緯

## Selection of Non-electrified Communities for the Supply of Distribution Transformers along Nacala Corridor

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Based on the field surveys along Nacala Corridor carried out in 1<sup>st</sup> and 2<sup>nd</sup> survey in Mozambique as well as the budgetary limitation of the project, consultant team selected the following two sites (non-electrified communities) for the supply of distribution transformer.

- Posto de Secreteriado de 25 de Setembro
- Muxaieque

The following documents showing how these two communities were selected are attached herewith for EDM's perusal.

- Site selection for the supply of distribution transformers  
This document explains the way of site selection.
- Survey results of electrification candidate site for the supply of distribution transformers  
This table shows the result of field surveys and also the information provided from EDM.

Please be noted that the survey results do not always tally with the information provided by EDM as shown in the attached table. Therefore, this site selection should be duly reviewed by EDM so that the sites for the supply of distribution transformer can be finalized during our 3<sup>rd</sup> mission.

## Selection of the Non-electrified Communities for the supply of distribution transformers

### 1. Considered factors for selecting candidate sites

- ① Supply area of Namialo substation
  - Candidate sites should be located in the area where Namialo substation will supply electric power.
- ② Location and Population
  - Japan's contribution will be larger when there is high population in candidate sites along Nacala corridor.
- ③ Less cost allocation for EDM
  - EDM's cost allocation will be less and the construction period will be shorter if candidate sites are located near existing distribution lines.
- ④ Presence of electrification requests from residents to EDM.
  - The presence of the requests will be one of the essential reasons for electrification.
- ⑤ Time of electrification
  - EDM's electrification schedule of the site should be matched to the period of this project.(2016-2017)

### 2. The result of selection

A table below shows the evaluation results for selecting candidate sites with considering factors above. The consultant team concluded that No.2 (Posto de Secreteriado de 25 de Setembro) and No.4 (Muxaieque) are suitable as candidate sites based on the evaluation.

Candidate site Considered factor	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10
①Supply area of Namialo substation	○	○	○	○	○	○	○	×	×	×
②Location (along Nacala corridor) & Population	×	○	-	○	△	△	△	×	-	-
③EDM's cost allocation (Distance from existing distribution lines)	○	○	×	○	×	○	○	×	×	×
④Presence of electrification request	○	○	×	○	○	○	○	×	×	×
⑤Time of electrification	×	○	○	○	×	○	○	×	×	×






### 3. Capacity of transformers

EDM suggested the capacity of transformers for these two sites as below:

- Posto de Secreteriado de 25 de Setembro: 160kVA x 2
- Muxaieque: 200kVA x 1 (according to EDM's design manual, 250kVA would be selected instead.)

The consultant team needs the explanation for the selection of these transformers from EDM during our 3rd mission in Maputo.




## Survey results of electrification candidate sites for the supply of distribution transformers

	Candidate site NO. 1	Candidate site NO. 2	Candidate site NO. 3	Candidate site NO. 4	Candidate site NO. 5
Field view and the state for hearing of opinion					
Location	Ratani	Posto de Secreteriado de 25 de Setembro	Posto Administrativo de Namialo	Muxaieque	Zona de Matanusca
Electrification schedule	2015	2016~2017	2017	2016~2017	2018~2019
Present main buildings	<ul style="list-style-type: none"> <li>A large number of villages by the roadside</li> <li>A school</li> </ul>	<ul style="list-style-type: none"> <li>A government postal related office</li> <li>Scattered Villages in wide area</li> </ul>	<ul style="list-style-type: none"> <li>A regional government office (under construction)</li> <li>It is planned to construct governmental residences in the future.</li> <li>Almost no villages</li> </ul>	<ul style="list-style-type: none"> <li>Scattered villages from roadside to inland</li> </ul>	<ul style="list-style-type: none"> <li>Villages spreading widely by the roadside</li> </ul>
Present population based on field survey	<No investigation>	7,974 households · 5~6 people/ household [Estimated population: 44,000]	<No investigation>	3,800 households · 6 people/ household [Estimated population: 22,800]	600 households · 6 people /household [Estimated population: 3,600]
Present population from EDM	500	200	200	300	200
Prospect of electric power demand increase	<Waiting for a response>	<Waiting for a response>	<Waiting for a response>	<Waiting for a response>	<Waiting for a response>
Distance from existing distribution lines	About 50m far from 33kV distribution lines	Directly under 33kV distribution lines	About 500m far from 33kV distribution lines (New distribution lines need road crossing.)	About 50m far from 33kV distribution lines	About 500m far from 33kV distribution lines
Construction scale & estimated cost of the new distribution facilities based on field survey	Pole: 2 MV Line: 50m [500USD]	Pole: 0 MV Line: A few meter [Less than 500USD]	Pole: 3 MV Line: 500m [5,000USD]	Pole: 2 MV Line: 50m [500USD]	Pole: 3 MV Line: 500m [5,000USD]
Construction scale of the new distribution facilities from EDM & estimated cost by survey team	MV: line×1km, pole×12 LV: line×2.5km, pole×65 (TR: 200kVA×2) [73,250 USD excluding TR]	MV: line×1.2km, pole×15 LV: line×3km, pole×75 (TR: 160kVA×2) [87,900 USD excluding TR]	MV: line×1.2km, pole×15 LV: line×4km, pole×100 (TR: 160kVA×2) [106,800 USD excluding TR]	MV: line×1.5km, pole×19 LV: line×3km, pole×75 (TR: 200kVA×1) [95,700 USD excluding TR]	MV: line×0.5km, pole×10 LV: line×2.5km, pole×65 (TR: 160kVA×1) [60,250 USD excluding TR]
Power supplying substation (After the construction of Namialo substation)	Monapo substation (Namialo substation)	Monapo substation (Namialo substation)	Monapo substation (Namialo substation)	Monapo substation (Namialo substation)	Monapo substation (Namialo substation)
Necessity and urgency for electrification	<ul style="list-style-type: none"> <li>Existing electrified area will be expanded.</li> <li>Written request for electrification has already been submitted to EDM.</li> </ul>	<ul style="list-style-type: none"> <li>It is expected that the number of private residences will increase in the future.</li> <li>Written request for electrification has already been submitted to EDM.</li> </ul>	<ul style="list-style-type: none"> <li>It is expected that the number of private residences will increase after a couple of years.</li> </ul>	<ul style="list-style-type: none"> <li>Written request for electrification has already been submitted to EDM.</li> </ul>	<ul style="list-style-type: none"> <li>Written request for electrification has already been submitted to EDM.</li> </ul>
Special Notes	<ul style="list-style-type: none"> <li>If electricity is supplied from Namialo substation, voltage drop will decrease.</li> </ul>	<ul style="list-style-type: none"> <li>If electricity is supplied from Namialo substation, voltage drop will decrease.</li> </ul>	<ul style="list-style-type: none"> <li>If electricity is supplied from Namialo substation, voltage drop will decrease.</li> </ul>	N/A	N/A

※ Updated based on the secondary research

※ Information provided by EDM

## Survey results of electrification candidate sites for the supply of distribution transformers

	Candidate site NO. 6	Candidate site NO. 7	Candidate site NO. 8	Candidate site NO. 9	Candidate site NO. 10
Field view and the state for hearing of opinion					
Location	Bairo 1 de maio	Micolene	Napacala	Bairo Nova Cuamba	Bairo Naquti
Electrification schedule	2017	2016	2018	2018	2018
Present main buildings	<ul style="list-style-type: none"> <li>• A regional government office</li> <li>• An agricultural commune</li> </ul>	<ul style="list-style-type: none"> <li>• A school</li> <li>• A village and a plant</li> </ul>	<ul style="list-style-type: none"> <li>• Scattered villages in wide area</li> </ul>	<ul style="list-style-type: none"> <li>• Sparsely spreading villages</li> </ul>	<ul style="list-style-type: none"> <li>• Villages by the roadside</li> <li>• Two schools</li> </ul>
Present population based on field survey	350 households Population: 5,000	485 households · 3~8 people /household Population: 1,521	507 households · 7 people/household Estimated population: 3,500	<No investigation>	<No investigation>
Present population from EDM	300	500	800	700	600
Prospect of electric power demand increase	<Waiting for a response>	<Waiting for a response> The capacity of the transformer is expected to be 250kVA (opinion by EDM)	<Waiting for a response> The capacity of the transformer which is expected to be 315kVA (opinion by EDM)	<Waiting for a response>	<Waiting for a response>
Distance from existing distribution lines	<ul style="list-style-type: none"> <li>• About 50~100m far from 33kV distribution lines (New distribution lines need road crossing.)</li> </ul>	<ul style="list-style-type: none"> <li>• About 100m far from 33kV distribution lines (New distribution lines need road crossing.)</li> </ul>	<ul style="list-style-type: none"> <li>• About 700m far from 33kV distribution lines</li> </ul>	A greater distance from 33kV distribution lines	A greater distance from 33kV distribution lines
Construction scale & estimated cost of the new distribution facilities based on field survey	Pole: 2 MV Line: 50m [500USD]	Pole: 2 MV Line: 50m [500USD]	Pole: 4 MV Line: 700m [7,000USD]	<unknown >  <unknown>	<unknown>  <unknown>
Construction scale of the new distribution facilities from EDM & estimated cost by survey team	MV: line × 1km, pole × 12 LV: line × 3km, pole × 75 (TR: 160kVA × 2) [82,700 USD excluding TR]	MV: line × 1.2km, pole × 15 LV: line × 3km, pole × 75 (TR: 200kVA × 2) [87,900 USD excluding TR]	MV: line × 1.5km, pole × 20 LV: line × 5km, pole × 125 (TR: 200kVA × 3) [133,500 USD excluding TR]	MV: line × 0.5km, pole × 10 LV: line × 3.5km, pole × 90 (TR: 160kVA × 2) [79,150 USD excluding TR]	MV: line × 1km, pole × 12 LV: line × 3km, pole × 75 (TR: 200kVA × 2) [82,700 USD excluding TR]
Power supplying substation (After the construction of Namialo substation)	Monapo substation (Namialo substation)	Monapo substation (Namialo substation)	Monapo substation (Namialo substation or Monapo substation)	Monapo substation (Monapo substation)	Monapo substation (Monapo substation)
Necessity and urgency for electrification	<ul style="list-style-type: none"> <li>• Written request for electrification has already been submitted to EDM.</li> </ul>	<ul style="list-style-type: none"> <li>• Written request for electrification has already been submitted to EDM.</li> </ul>	<ul style="list-style-type: none"> <li>• The number of the residences is not increasing due to no electric power.</li> </ul>	<ul style="list-style-type: none"> <li>• Local residents requested electrification.</li> </ul>	<ul style="list-style-type: none"> <li>• No request for electrification from local residents.</li> </ul>
Special Notes	<ul style="list-style-type: none"> <li>• Public facilities such as schools, hospitals, and small-sized firms will be constructed in the future.</li> </ul>	<ul style="list-style-type: none"> <li>• The area is expected to increase residences.</li> </ul>	<ul style="list-style-type: none"> <li>• Residential buildings and schools will be constructed toward to Nacala corridor in the future.</li> </ul>	N/A	N/A

※      Updated based on the secondary research

※      Information provided by EDM

### 1 3. 簡易環境影響調查 (SES)





Prepared by:



Prepared for:



**ENVIRONMENTAL AND SOCIAL  
CONSIDERATION SURVEY (ESCS)  
FOR PREPARATORY SURVEY ON  
THE PROJECT FOR  
REINFORCEMENT OF  
TRANSMISSION NETWORK IN  
NACALA CORRIDOR IN THE  
REPUBLIC OF MOZAMBIQUE**

**Simplified Environmental Study**

**January 2015**

**THE PRESENT DOCUMENT COMPRISES:**

**PART 1: EXECUTIVE SUMMARY**

**PART 2: SIMPLIFIED ENVIRONMENTAL STUDY**

**PART 3: PUBLIC ENGAGEMENT REPORT**

## ACRONYMS AND ABBREVIATION

%	Percentage
°C	Degree Celsius
AIDS	Acquired Immune Deficiency Syndrome
CFM	Caminhos de Ferro de Moçambique
CO	Carbon monoxide
CRM	Constitution of the Republic of Mozambique
dBA	Decibels
DPA	Direcção Provincial de Agricultura (Provincial Directorate of Agriculture)
DPCA	Direcção Provincial de Coordenação da Acção Ambiental (Provincial Directorate for the Coordination of Environmental Affairs)
DPGM	Direcção Provincial de Geologia e Minas (Provincial Directorate of Geology and Mines)
DPRME	Direcção Provincial dos Recursos Minerais e Energia (Provincial Directorate of Mineral Resources and Energy)
DPT	Direcção Provincial do Trabalho (Provincial Directorate of Labour)
EC	Electrical Conductivity
EDM	Electricidade de Moçambique
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Study
EMP	Environmental Management Plan
EMoP	Environmental Monitoring Plan
EN	National Roads
ESCS	Environmental and Social-Consideration Survey
ESG	General Secondary Education
ESIA	Environmental and Social Impact Assessment
GoM	Government of Mozambique
GWh	GigaWatt
ha	Hectare
HCB	Hydro-electrical Power Station of Cahora Bassa
HIV	Human Immunodeficiency Virus
IFC	International Finance Corporation
INAM	Instituto Nacional de Meteorologia (National Institute of Meteorology)
INE	Instituto Nacional de Estatística (National Institute of Statistics)
ITCZ	Inter-tropical Convergence Zone
JICA	Japan International Corporation Agency
kg	Kilogram
kHz	KiloHertz
km	Kilometre
km <sup>2</sup>	Square kilometre
kn	Knot
kV	Kilovolt
LNG	Liquid Natural Gas
m	Metre

m/s	Metre per second
m <sup>3</sup>	Cubic Metres
m <sup>3</sup> /h	Cubic Metres per Hour
mg/L	Milligram per litre
MICOA	Ministério para a Coordenação da Acção Ambiental (Ministry for the Coordination of Environmental Affairs)
MINAG	The Ministry of Agriculture
mm	Millimetre
MML	Minas Moatize Limitada
MSA	The Ministry of State Administration
MW	Megawatt
MZN	Metical
N	North
NE	North East
No-Go	No-Action Alternative
NO <sub>2</sub>	Nitrogen Dioxide
NW	North West
ODA	Official Development Assistance
OHS	Over Head
OHS	Occupational Health and Safety
OHTL	Overhead Transmission Line
OP	Operational Policies
PAP	Project Affected Persons
ROW	Right of Way
RU	Relocation Unit
S	South
SADC	Southern African Development Community
SAPP	Southern Africa Power Pool
SCDS	Specialist Environmental Services and Social Development Unit
SDPI	Serviços Distritais de Planeamento e Infra-estruturas (Planning and Infrastructure Provincial Services)
SE	South East
SEA	Simplified Environmental Assessment
SES	Simplified Environmental Study
SLUCP	Simplified Land-use Compensation Plan
sqkm	Square Kilometre
SO <sub>2</sub>	Sulfur Dioxide
SS	Substation
STI	Sexual Transmitted Infections
SW	South West
T	Tons
TDS	Total Dissolved Solids
TL	Transmission Line
VAT	Value Added Tax
WBG	World Bank Group
WBOP	World Bank Operational Policies

WWF

World Wildlife Fund

## **PART 1**

### **EXECUTIVE SUMMARY**

## EXECUTIVE SUMMARY

The present document is the Simplified Environmental Study (SES) of the proposed Project for the reinforcement of the transmission network in Nacala Corridor, Namialo, Republic of Mozambique. A Simplified Environmental Study (SES) and Simplified Land-use Compensation Plan (SLUCP) have been commissioned by Japan International Corporation Agency (JICA) in order to meet their requirements and the national legislation in Mozambique.

The Project is proposed by Japan International Corporation Agency (JICA), which is a Japanese Agency, responsible for implementation of Official Development Assistance (ODA) that supports the growth and socio-economic stability of developing countries with the aim of contributing to peace and development of international society.

Electricidade de Moçambique E.P. (EDM) is the Project Proponent. EDM, the national electricity company in Mozambique, is responsible for developing and implementing the Project on behalf of the Government of Mozambique.

A SES and SLUCP were commissioned to *Impacto – Projectos e Estudos Ambientais Lda* (Impacto), a fully registered Mozambican company with the Ministry for the Coordination of Environmental Affairs to conduct EIAs in Mozambique and has extensive experience in EIAs. The main objectives of the EIA process are:

- to identify and assess the main potential environmental impacts (negative and positive) of the proposed project, taking into account the biophysical and socioeconomic domains; and
- to identify the mitigation, environmental management and environmental monitoring measures that will allow for minimizing potential negative impacts and to enhance potential positive impacts of the project, so as to ensure that it can be implemented in an environmentally sound manner.

The environmental legal framework against which the proposed project needs to comply, includes:

- Both national and international legal instruments;
- The national legal framework specific to energy sector;
- The identification of those international conventions ratified by the Government of Mozambique.

The proposed project site is in the Administrative Post of Namialo, Meconta District, Nampula Province. The establishment of a new substation in Namialo aims at ensuring a stronger supply of electricity to the Northern region of the country as well as other benefits including the reduction of energy losses, the energy production at a competitive market price, the availability of supply capacity of good quality electricity, the contribution to energetic security in Mozambique (on the medium and long term), the efficient use of the existing EDM staff, the creation of jobs and economic growth and, the reduction of CO<sub>2</sub> emissions, amongst others.

The construction of Namialo substation will allow in/out configuration for the existing two transmission lines to Pemba and Nacala. This can bring reliability and redundancy of power supply to Nacala corridor as well as Pemba. The proposed Namialo SS will be located on the junction point of these two lines.

The project facilities planned for the new construction are rather small-scale, basically confined to a new electricity transformer substation located along the ROW of existing power transmission line (TL) in Namialo (gross land area requirement is about 10 ha), a new access road and implantation of new transmission towers in substitution of the old ones present in the study area.

A new access road is planned for the study area and initially it will be a temporary access road as per this project is planned so as to facilitate effective transportation of construction materials/equipment and others to the substation of only about 1.5 km in length from EN12. It is noted that 31m of this 100m width as affected gross ROW is the actual ROW of 110kV transmission line under the jurisdiction of EDM. In fact, actual width of road will be much less (about 10 m width of ROW for road, including temporary land clearance, within the 100 m width of gross ROW is regarded as the maximum requirement for road).

The project facilities planned also include construction of 2 new transmission towers and also the demolition of 3 existing transmission towers.

An alternative site was initially chosen under the scope of the Feasibility Study on Chimuara-Nacala Transmission Project (2013), approximately 800 meters from the current Namialo site.

The different items surveyed for the site selection were site area, access, topographic/geographical features, vegetation, meteorology, transmission network, environmental and social considerations, and transportation of heavy objects, among others. The site assessed under the Feasibility Study on Chimuara-Nacala Transmission Project (2013) was less advantageous than the current Namialo site due to erosion potential, closer proximity to village and higher potential for economic resettlement.

With the No-Action Alternative (No-Go), possibilities of expanding the access to stable electrical power of good quality to more households and new industries in the Northern region would be highly restricted by the needs of other countries affiliated in the Southern Africa Power Pool (SAPP).

For the purpose of evaluating the environmental and socioeconomic impacts, three main phases of the proposed project were considered in this study: construction, operation and decommissioning.

In the light of the proposed project, a number of potential environmental and socioeconomic impacts (negative and positive) were identified and assessed. The large majority of the biophysical impacts were considered low in terms of significance. The biophysical parameters assessed include geology, geomorphology and soils, air quality, hydrology, solid waste, noise and vibration, flora and fauna, landscape and visual and land use. The socioeconomic impacts were both positive and negative during the three phases of the proposed project. The positive socioeconomic impacts



were particularly focused on the economy (i.e. direct and indirect employment) and public utilities (i.e. increase in the amount of energy available). The negative socioeconomic impacts were mostly associated with health (i.e. STI's in the population and workers safety, work accidents), economy (i.e. loss of crops, crop areas and other economic opportunities), tensions (i.e. high expectations with regards to employment opportunities and social conflict due to physical presence of external workers) and traffic and transport (i.e. changes in the intensity and traffic due to the transport of the construction material and demolition waste to landfills and recycling areas).

An environmental management plan was drafted in order to:

- Ensure that the proponent, EDM, would be in charge, through the establishment of a RU, of implementation, mitigation and monitoring of the activities presented in the SLUCP.
- Provide the Ministry for Coordination of Environmental Affairs (MICOA) with an instrument that facilitates the objective evaluation of the different project phases, keeping in mind the Mozambican Environmental Legislation, and
- Provide the Proponent of the Project with clear and obligatory instructions with regard to his environmental responsibilities during all project phases.

A general perspective on the establishment of the new substation in the Namialo site suggests that the project will provide employment opportunities, gains in the local and national economy, provision of market for supply and building material, informal sector benefits, increase in electricity supply, increase in revenue and increase in security. Under the light of the above and since no fatal flaws have been identified, we propose that the establishment of the substation in the Namialo area should proceed. From the assessment point of view, it is considered that the project could be implemented without causing any major detrimental effects on the physical, biological and socio-economic environment provided that the mitigation, environmental management and environmental monitoring measures are fully implemented and will allow for minimizing potential negative impacts and to enhance potential positive impacts of the project, so as to ensure that it can be implemented in an environmentally and socially sound manner.

## **PART 2**

### **SIMPLIFIED ENVIRONMENTAL STUDY**

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## 1 INTRODUCTION

The present document is the Simplified Environmental Study of the proposed Project for the Reinforcement of the transmission network in Nacala Corridor, Namialo, Republic of Mozambique.

### 1.1 Objective and scope of the study

A Simplified Environmental Study (SES) and Simplified Land-use Compensation Plan (SLUCP) have been commissioned by Japan International Corporation Agency (JICA) in order to meet their requirements and the national legislation in Mozambique.

The proposed project is small-scale that falls under the area of influence of the already approved ESIA study by MICOA (Letter No. 138/GM/MICOA/13 dated 6th of December 2013). Consequently, MICOA/DPCA-Nampula does not require any further ESIA study for the project since the project is located under the area of influence of the above approved ESIA Report. Still, in order to meet the JICA Guidelines for Category B project SER (simplified environmental report) and SLUCP (simplified land-use compensation plan) were commissioned.

The SES Report for the Project outlines the legislative framework, provides a description of the project and its location, and provides a description of the biophysical and socioeconomic conditions of the study area. The report also provides an assessment of the impacts of the proposed project on the surrounding biophysical and social environment. Lastly it provides recommendations on how negative impacts can be mitigated and positive effects enhanced as well as a monitoring plan for relevant environmental parameters such as air quality, noise and vibration and waste management

### 1.2 Relevant laws, regulations and guidelines used in SES

The SES (simplified environmental report) process complies with the JICA guidelines as well as relevant Mozambican environmental legislation. The process was designed to assess the potential environmental and social impacts of the Project. The laws, regulations and guidelines are described in detail in Chapter 2.



### 1.3 Project Proponent

Electricidade de Moçambique E.P. (EDM) is the Project Proponent. EDM is responsible for developing and implementing the Project on behalf of the Government of Mozambique. EDM, the national electricity company in Mozambique, was transformed into a public enterprise in 1995. Its mission is to run production, transmission, distribution and marketing services for electricity in Mozambique, in the public interest and for the consumer's benefit preserving the environment.

### 1.4 SES implementing organization and experts of the team

*Impacto – Projectos e Estudos Ambientais Lda* (Impacto) is a fully registered Mozambican company financed entirely by Mozambican capital. Impacto was officially constituted in writing and the registration was published in the Government Gazette, No 33, Series III, on the 14th August 1996. Impacto is registered with the Ministry for the Coordination of Environmental Affairs to conduct EIAs in Mozambique and has extensive experience in EIAs. The contact details for Impacto are as follows:



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The specialists that form part of the EIA team are provided in Table 1.

**Table 1: The EIA team**

Name	Area of Expertise	Role
J. Hatton	Environmental Management	Project Director
M. Pereira	Environmental Management	Project Manager
D. de Castro	Socioeconomic Specialist	SLUCP specialist
E. Muiuane	Hydrologist	Surface Water Study
F. Munguambe	Public Consultation	Public Consultation Specialist
H. Nhampanze	Public Consultation	Public Consultation Specialist

## 2 LEGAL FRAMEWORK

### 2.1 Introduction

The objective of this chapter is to present the environmental legal framework against which the proposed project needs to comply, including:

- Both national and international legal instruments;
- The national legal framework specific to energy sector
- The identification of those international conventions ratified by the Government of Mozambique; and

Also addressed in this chapter are some international guidelines related to best practice in the development of projects of this nature that, whilst not constituting formal legal imperatives, are important documents, as they establish standards, guidelines or recommendations related to this project's activities.

### 2.2 Environmental Management

The 2004 Constitution of the Republic of Mozambique (CRM) defines the right of all citizens to live in a balanced natural environment, and of their obligation to protect it (Article 72). Furthermore, the State is required to (i) promote initiatives capable of ensuring the ecological balance and the preservation of the environment; and (ii) implement policies to prevent and control pollution and to integrate environmental objectives in all public sector policies so as to guarantee the citizens' right to live in a balanced environment under a sustainable development framework (Article 117 of CRM).

The National Environmental Policy, approved by Resolution No. 5/95, of 6 December 1995, lays the foundations for all ancillary environmental legislation. Article 2.1 of this Policy promotes sustainable development through a compromise between the country's socio-economic development needs and the protection of the environment. This policy promotes, *inter alia*, the management of the country's natural resources - and of the environment in general, such that resources preserve their functional and productive capacities for present and future generations.

The Environment Law (Law No. 20/97, of 1 October 1997) defines the legal basis for the implementation of this Policy. The Law applies to all public or private activities that may directly or indirectly affect the environment. Also, this law requires licensing for any activity under article 15 of the current law.

The Electricity Law (Law 21/97, of 7 November 1997) contains important clauses on the creation of rights of way, security and protection of cultural heritage and the environment.

The Land Law (Law 19/97, of 1 October 1997) includes, in article 8g, the classification of land occupied by overhead, ground, underground and submarine electricity installations and conductors, with a boundary strip of 50 metres each side of the overhead line or cable.

### 2.3 **Environmental Impact Assessment Regulations (Decree 45/2004 of 29 September as amended by Decree No. 42/2008 of 04 November)**

The EIA process is controlled by Environmental Impact Assessment Regulations under the Environmental Law approved by Decree 45/2004, of 29 September as amended by Decree No. 42/2008 of 04 November. These Regulations are applicable to all public and private activities.

Articles 3 and 5 of the EIA Regulations provide for a screening process which defines the extent and type of environmental assessment required. Three project categories are defined by the Regulations:

- Category A: Activities presented in Annex I are considered to have significant adverse impacts on the environment and are subject to an Environmental Impact Study (EIS).
- Category B: Activities listed in Annex II are those for which potential environmental impacts are less adverse than those of Category A projects and are subject to a Simplified Environmental Assessment (SEA).
- Category C: Activities listed in Annex III are exempt from an EIA and SEA but still require observance of good management practices.

A Simplified Environmental Study has been commissioned by the proponent, and as such, the EIA process must follow the provisions for this category. The Simplified Environmental Study is regulated by Article 13 of the EIA Regulations.

Under Article 13, the Simplified Environmental Study (SES) may commence, and should result in a report that contains as a minimum, the following:

- a) Non-technical summary including principles questions assessed and proposed conclusions;
- b) Location and description of the activity,
- c) Legal framework for the activity and their integration in existing development plans for the region within the direct area of influence of the activity;

- d) Environmental diagnosis including a brief description of the reference environmental setting;
- e) Identification and evaluation of environmental impacts from the activity;
- f) Environmental Management Plan for the activity, that includes the monitoring of impacts, environmental education programme, and emergency contingency plans;
- g) The identification of the multidisciplinary team that prepared the Simplified Environmental Study;
- h) Public Participation Report in accordance with requirements under No 9 of Article 14, where required.

In addition, the Simplified Environmental Study will include a Public Participation Process, in compliance with Article 14. The Public Participation Process undertaken as part of the Simplified Environmental Study is summarised in the Public Participation Report.

## 2.4 Waste Management

The regulating authorities and service providers for waste collection, treatment and disposal in Mozambique are district and municipal, while environmental protection is enforced at a central and provincial level.

The Environment Law (Law No. 20/97, of 1 October 1997) is the umbrella law for environmental matters and is an important instrument for the enactment of specific regulations, most notably the Regulation on Waste Management no. 13/2006 which provides the rules concerning the production, deposit on soil and subsoil and prohibits the throwing of waste to the water or to the atmosphere, of any toxic and polluting substances. In addition, the Regulation defines competencies in waste management, waste classifications, obligations for entities handling waste and environmental licensing obligations and collection, among others.

Additionally, the Municipality Law (Law no. 2/97, of 18 February 1997) obligates local municipalities to ensure basic sanitation and quality of life. Municipal responsibilities include the development of programmes for ecological protection and procedures for the removal of solid, treatment and disposal of solid residues including medical and hazardous waste.

Other key pieces of legislation pertinent to the treatment and disposal of solid waste include Article 6 of Environmental Law outlining coordinating the actions for environmental management, the regulation on Environmental Impact Assessment (Regulation No. 76/98, of 29 December 1998) and a further Regulation on Environmental Impact Assessment (Decree 45/2004, of 29 September 1998) requiring an Impact Assessment Study and the issue of an environmental licence for all entities/processes resulting in legally significant

waste streams. This regulation also stipulates that vehicles used for waste transportation and all waste management operators require licences.

Article 9 of the Regulation of Waste Management (Regulation 13/2006, of 15 June 2006) obliges the producers of waste to minimize waste generated. In addition, the Environment Law (Law No. 20/97, of 1 October 1997) imposes strict liability on entities causing environmental damage. The government is responsible for setting the compensation amount on a case by case basis, which includes the cost of remediation of the affected area.

Obligations under Article 9 of the Regulation of Waste Management (Regulation 13/2006, of 15 June 2006) include:

- Ensure the segregation of the different categories of waste;
- Ensure the treatment of the waste before its deposition;
- Ensure the protection of all workers engaged in the handling of waste against accidents and diseases resulting from their exposure to the same;
- Ensure that all waste to be transported contains minimum hazard of contamination, for the workers engaged in this process, for the general public and for the environment;
- Build the capacity of their workers in matter of health, occupational safety and environment;
- Ensure that the disposal of waste inside and outside the production site does not have a negative impact on the environment or on the public health and safety;
- Make a detailed annual record of the origins, quantities and types of waste handled, transported, treated, recovered or disposed of and keep it during the five years subsequent to the respective record.

## 2.5 Other relevant national legislation and policies

Other relevant national legislation and policies:

- Decree 495/73, on preventing the pollution of waters and beaches;
- Measures to protect biodiversity (Article 12 of the Environment Law 20/97), particularly with regard to protecting rare and protected land and marine flora and fauna species;
- Article 13 of Law 20/97, defining protected areas as areas and ecosystems recognized as having the status of the protected spaces listed in Annex A, including coral reefs, mangroves, forests, smaller islands, conservation zones or areas, populated areas producing the need for resettlement;
- Forest and Wildlife Law - relevant to the project's area of influence (article 10 of Law 10/99).
- Elements foreseen in Decree 12/2002 (Regulations of the Law on Forests and Wildlife) - especially in conservation areas for tourism (article 87) and articles 103, 104 and 105 on the construction of infrastructure;

- Law on Territorial Planning (Law 19/07) that, among other dispositions, reaffirms citizens' right and need to participate in the planning process, application of the principle of precaution, and environmental sustainability and protecting the land-use rights of local communities (article 4).
- Labour Law (Law 8/98) guaranteeing fair treatment and safe working conditions for workers in construction and operation;
- Decree 57/2011, establishing safety norms and standards for high-voltage lines and specifying, in article 28, that high-voltage lines equal to or more than 66 kV must have a protection zone 50 m wide;
- Decree 31/2012, regulating the resettlement process arising from economic activities.

## 2.6 International Norms and Directives

The following regional and international laws and conventions are considered applicable to this project:

- SAPP Environmental Directives, 2010;
- African Convention on the Conservation of Nature and Natural Resources;
- United Nations Convention on Biological Diversity;
- Convention on Wetlands of International Importance;
- Kyoto Protocol on the United Nations Convention on Climate Change;
- Protocol on Cooperation in the Energy Field of the Southern Africa Development Community;
- Stockholm Convention on Persistent Organic Pollutants; and
- Protocol on the Conservation of Wildlife and application of the law in SADC

Specific reference to international World Bank operational policies (OP) and World Bank group environment, health and safety (EHS) guidelines was made on the Feasibility Study on Chimuara-Nacala Transmission Project (2013), namely:

- WB OP 4.01 – Environmental Assessment;
- Policy and Standards on Social and Environmental Sustainability of the International Finance Corporation (IFC) of 2012;
- IFC Environment Health and Safety guidelines – General EHS Guidelines: environmental, April 2007;
- IFC Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution, April 2007; and, 19/09/2013 Pag. 24 Chimuara-Nacala Transmission Project Environmental Impact Assessment – Volume I – Main Report SCDS, Maputo
- IFC Environmental, Health, and Safety Guidelines – Occupational Health and Safety (OHS), April 2007;
- WB OP 4.11 – Physical Cultural Resources
- WB OP 4.12 – Involuntary Resettlement

- WB OP 4.36 – Forests
- Legislation and Directives specifically applicable to special disciplines that will be considered during the EIA process will be detailed in the relevance sections of the EIA terms of reference.

### 3 DESCRIPTION OF PROPOSED ACTIVITY

This Simplified Environmental Assessment pertains to the construction of a new substation in the Administrative Post of Namialo, Meconta District, Nampula Province, Republic of Mozambique.

#### 3.1 Project Justification

The construction of a substation in Namialo will ensure a stronger supply of electricity to the Northern region of the country with consequent improved socio-economic benefits. Please refer to Section 10 for the beneficial importance of the project.

The construction of Namialo substation will allow in/out configuration for the existing two 110kV OH transmission lines to Pemba and Nacala. This can bring reliability and redundancy of power supply to Nacala corridor as well as Pemba. The proposed Namialo SS will be located on the junction point of these two lines.

#### 3.2 Project Purpose

The purpose of the current project includes the following:

- To bring reliability and redundancy of power supply to Nacala Corridor as well as Pemba by levelling the load of the two transmission lines.
- To increase the power supply capacity to Nacala area.
- To reinforce distribution power supply to Namialo area where the industrial growth is expected. (Monapo Substation has only 16 MVA, 110/33kV capacity).
- To decrease the electricity fault due to old equipment and human error

#### 3.3 Geographical Location of the Proposed Project

The proposed substation is located in the Administrative Post of Namialo, Meconta District, Nampula Province. The relative position of the study area to Nampula city and within the Nampula Province is shown in Figure 1. The proposed study area is located approximately 78 kms from the Nampula city and also approximately 72 kms from the coastline.



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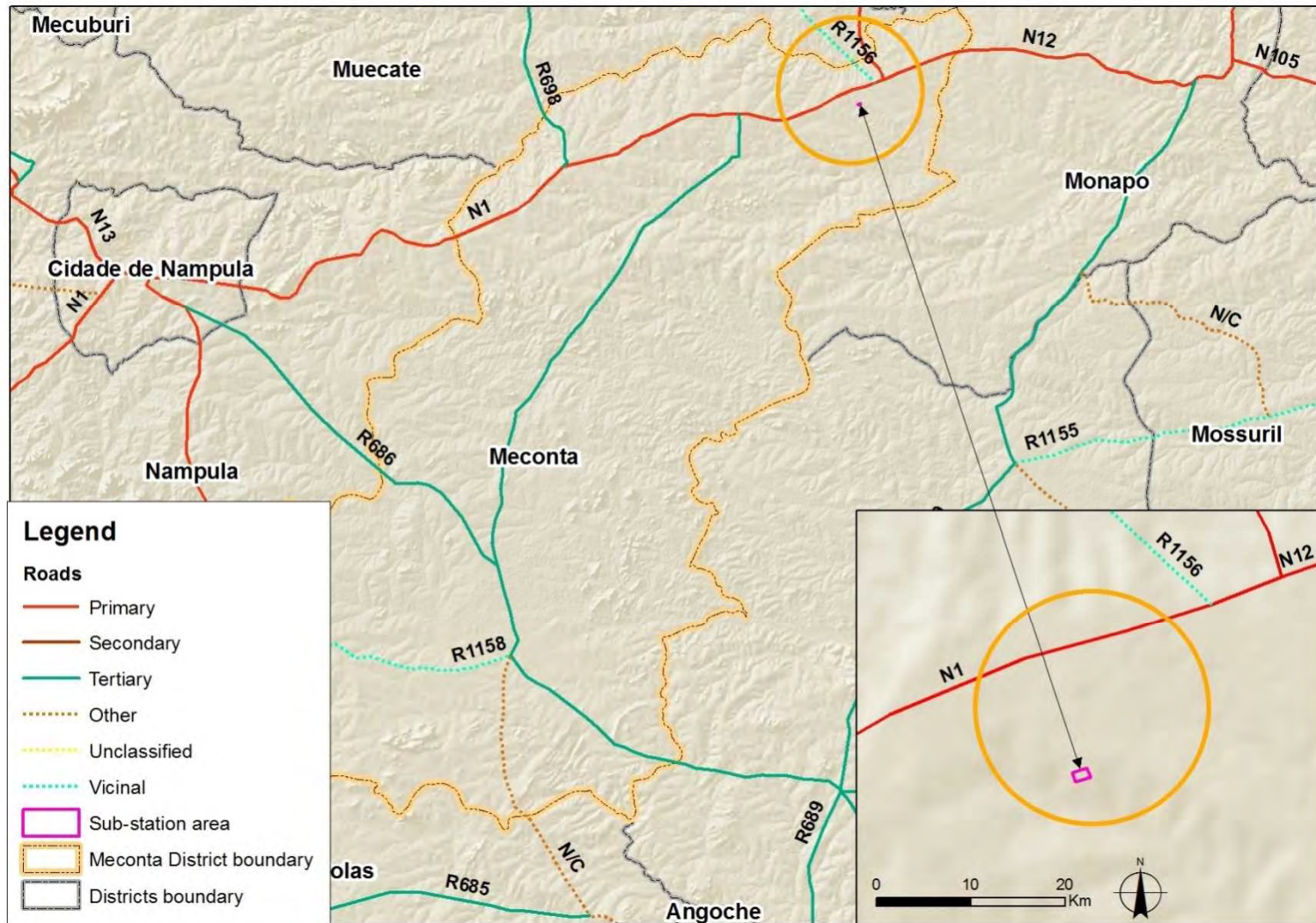


Figure 1: Geographical Location of the proposed project

A new access road is planned for the study area and initially it will be a temporary access road as per this project is planned so as to facilitate effective transportation of construction materials/equipment and others to the substation of only about 1.5 km in length from EN12. It is noted that 31m of this 100m width as affected gross ROW is the actual ROW of 110 kV transmission line under the jurisdiction of EDM. In fact, actual width of road will be much less (about 10 m width of ROW for road, including temporary land clearance, within the 100 m width of gross ROW is regarded as the maximum requirement for road).

The layout of the new substation and access road is shown in Figures 2 and Figure 3.



Figure 2: Layout of Namialo Substation Site

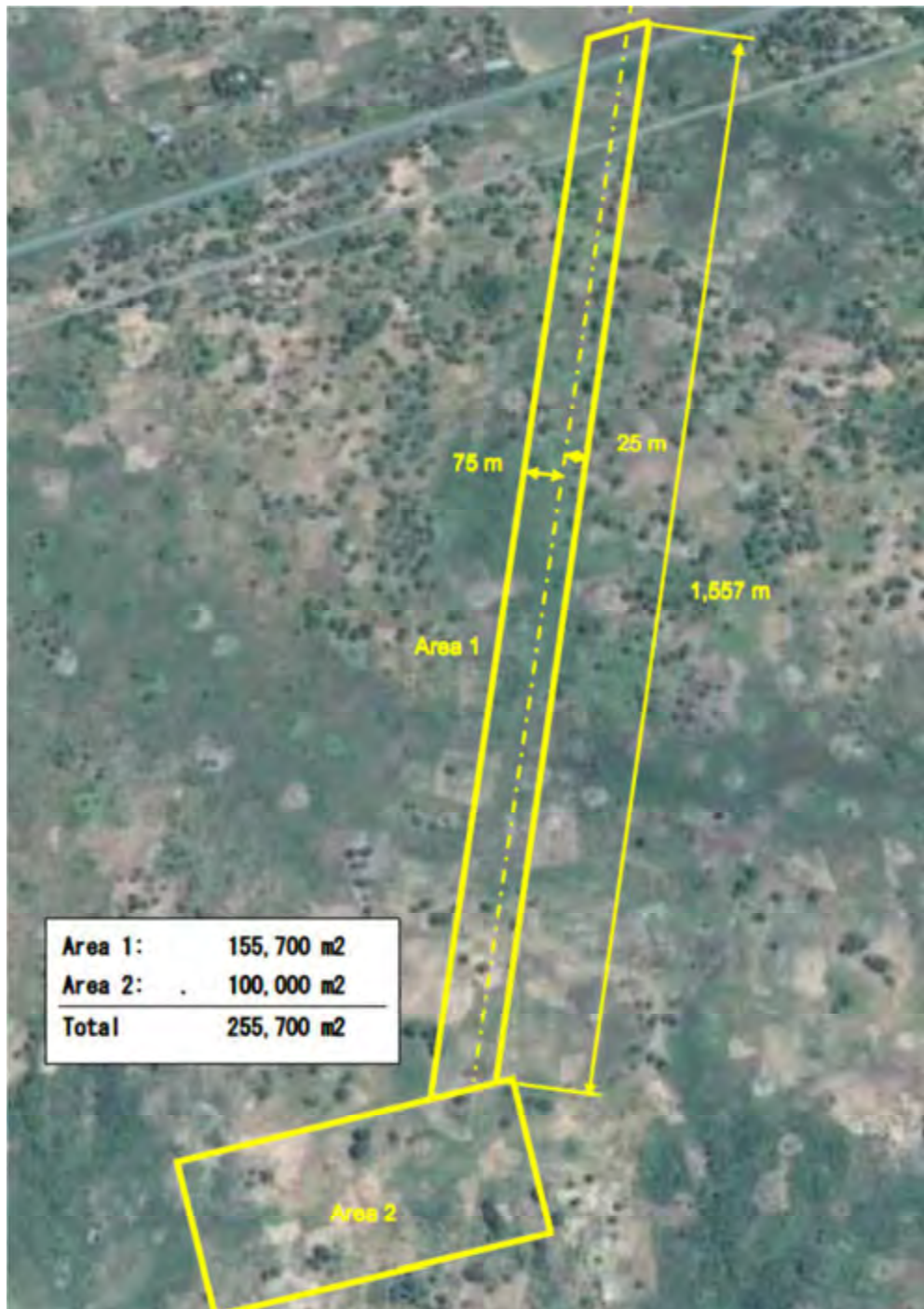


Figure 3: Layout of substation site in relation to the access road

The project facilities planned also include construction of 2 new transmission towers and also the demolition of 3 existing transmission towers.

### 3.4 Assumptions and Limitations

Up to this stage, the final technical description of the project and design parameters, including dimensions, layout, building dimensions, characteristics of equipment were not readily available for the present study.

Consequently, the identification and description of impacts and adequate mitigation measures associated with the construction and operation of the Namialo substation and temporary access road is based on the information supplied *viz.* the location of Namialo substation and temporary access road as shown in Figure 3.

## 4 ANALYSIS OF ALTERNATIVES

### 4.1 Site Alternatives

An alternative site was initially chosen under the scope of the Feasibility Study on Chimuará-Nacala Transmission Project (2013), approximately 800 meters from the current Namialo site (Figure 4).

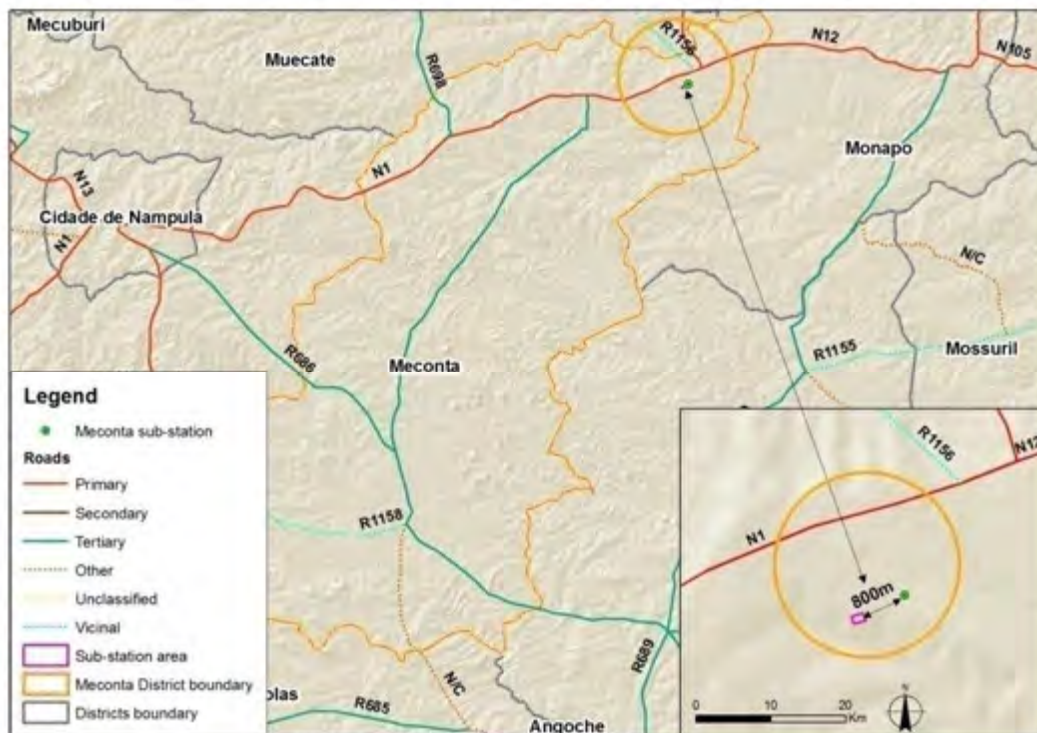


Figure 4: Geographical Location of the alternative site.

The different items surveyed for the site selection were site area, access, topographic/geographical features, vegetation, meteorology, transmission network, environmental and social considerations, and transportation of heavy objects, among others. The site assessed under the Feasibility Study on Chimuará-Nacala Transmission Project (2013) was less advantageous than the current Namialo site due to erosion potential, closer proximity to village and higher potential for economic resettlement.

### 4.2 The “No Action” Alternative

The Cahora Bassa Hydroelectric Dam (HCB) is the main source of electrical power supply in Mozambique. Part of the power produced is being transported to the Central and Northern regions of the country by means of a 220 kV AC transmission line, the other part is being transported to the neighbouring country Zimbabwe by means of a 400 kV AC transmission line.

However, the largest part of the power produced by HCB is being sent to the Apollo substation in South Africa through a 535 kV DC transmission line and part of it is then supplied to the Southern Africa Power Pool (SAPP) region.

Mozambique's national power grid is interlinked with the SAPP and operates as an integral part of the countries in the region. As the power system of the Southern region, which includes Maputo City, is located more than 1,000 km away from the HCB, the power is being imported from the SAPP through the power networks of South Africa and Swaziland through a 400 kV AC transmission line. As a result, more than 80% of the internal power demand is being supplied via South Africa.

Currently, the demand for electrical power in the entire country corresponds to approximately 610 MW and 4,025 GWh/year of power consumption, with a maximum potency of 610 MW. However, the average annual growth rates during the past 5 years reached values between 10.6% and 13.8%. The prevision is that the demand for power will continue to increase at high rates during the next years because of the new economical activities underway or starting and the expected increase in income levels.

The demand for electrical power is expected to increase continuously at a constant rhythm in the next future. However, the purchase of electrical power from the Cahora Bassa Hydro-electrical Dam, which corresponds to 88% of the power supply capacity of the municipality, is limited to 300 MW of firm energy and 200 MW of not firm potency. Any increase in these numbers is considered to be difficult, as this requires cession negotiations with other countries affiliated in the SAPP.

With the No-Action Alternative (No-Go), possibilities of expanding the access to stable electrical power of good quality to more households and new industries in the Northern region would be highly restricted by the needs of other countries affiliated in the SAPP.

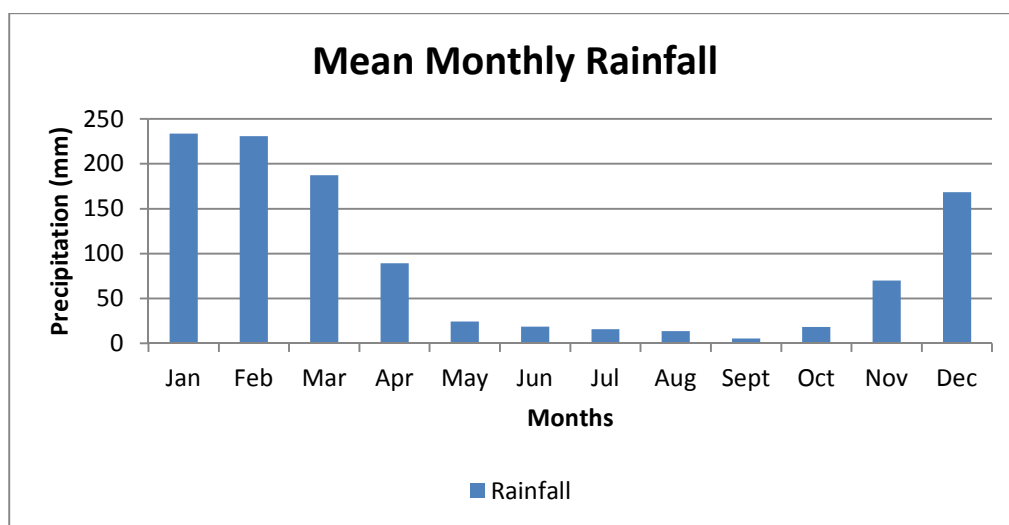
Because of the expected growth of the demand for power supply, there is a need for the energy sector of Mozambique to reinforce the current electrical grid, not only to maintain the current capacity but to guarantee an increase in the capacity of power supply from a trustworthy source in the years to come. Within this context, it seems that the implementation of the new Namialo substation is crucial.

## 5 DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT OF THE PROJECT AREA

### 5.1 Meteorology

#### 5.1.1 Rainfall and Temperature

The Köppen climate classification for northern Mozambique and is a humid equatorial climate with a dry winter (Köppen Aw). The area is strongly influenced by the relative position of the Inter-tropical Convergence Zone (ITCZ) and its seasonal migration between hemispheres. Two distinct climatic seasons are experienced, with a hot and wet summer from November to April, and a cooler and dry winter season from May and October. In the southern hemisphere summer the ITCZ is located at about 15° S. Summer rain occurs in the form of convective storms as a result of surface convergence. In the southern hemisphere winter the ITCZ migrates to around 15° N. The atmosphere is drier and divergence prevails with very little rainfall occurring. Information is available for Nampula City, which is representative of the study area (Figure 5). The Nampula city meteorological station is located in 15°06'00.0"S 39°17'00.0"E.

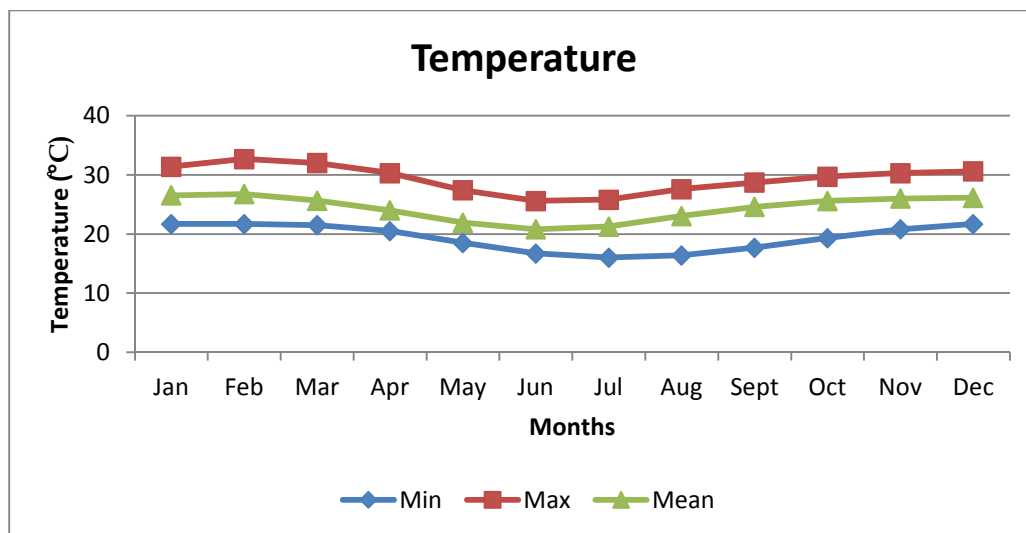


Source: <http://www.inam.gov.mz/produtos/estatisticas/nampula.htm>

**Figure 5: Mean Monthly Rainfall in Nampula City**

The mean annual rainfall is about 1100 mm. Between 1971 and 2000 (INAM, date accessed 08.08.2014), the majority of the rainfall occurred in summer between November and April. A strong seasonal trend is clearly evident in Figure 5.

Also for the mean monthly temperatures, information is only available for Nampula city (Figure 6). The mean monthly temperatures varied between 19,4°C and 29,3°C. The mean annual temperature in the study area ranges between 24°C and 25°C. The annual temperature range (difference between the mean temperature of the warmest month and the temperature of the coldest month) is about 5,9°C.



Source: <http://www.inam.gov.mz/produtos/estatisticas/nampula.htm>

Figure 6: Mean Monthly Temperature (Min, Max and Mean) in Nampula City

### 5.1.2 Humidity

In Nampula city, in the summer season, the humidity is generally high and may reach the 90 or 100%. Information from the Nampula city substation regarding humidity (highest, lowest and average) is not available. Relative humidity data is only available for the stations located in Maputo, Macomia, Mocimboa da Praia and Montepuez.

### 5.1.3 Wind

Wind data is not available for the study site. The closest available information is for the north of Mozambique. Winds are generally very light on the northern Mozambique coast due to the tropical location and a sheltering effect provided by Madagascar from the Indian Ocean. The average wind speeds are less than 5 m/s, but gusts up to 20 m/s have been known to occur in all months. The winds are almost exclusively from the northeast and east from September to March, and become almost exclusively southerly in the winter months, from April to August. As stated above, throughout the year, the winds are generally weak to moderate, with speeds ranging between 0.5 and 6.7 m/s. North winds prevail during the January and February with speeds between 0.5 and 3.6 m/s (Figure 7).



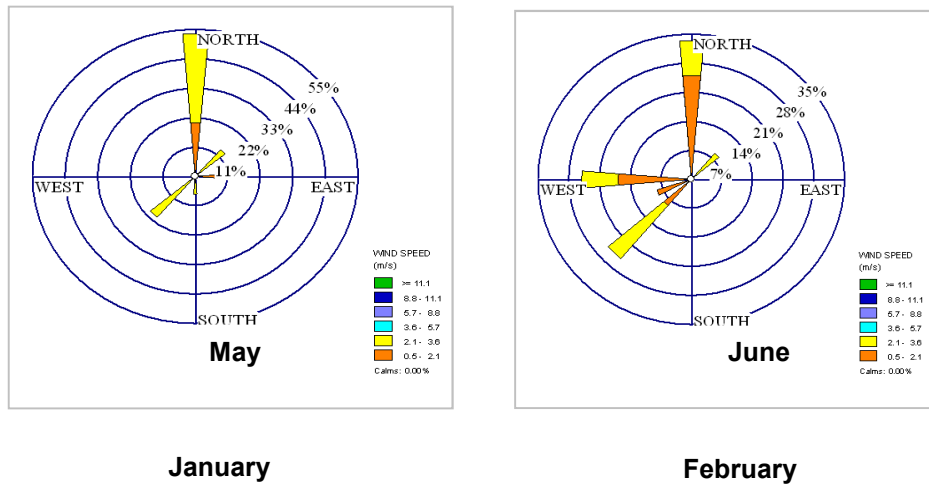
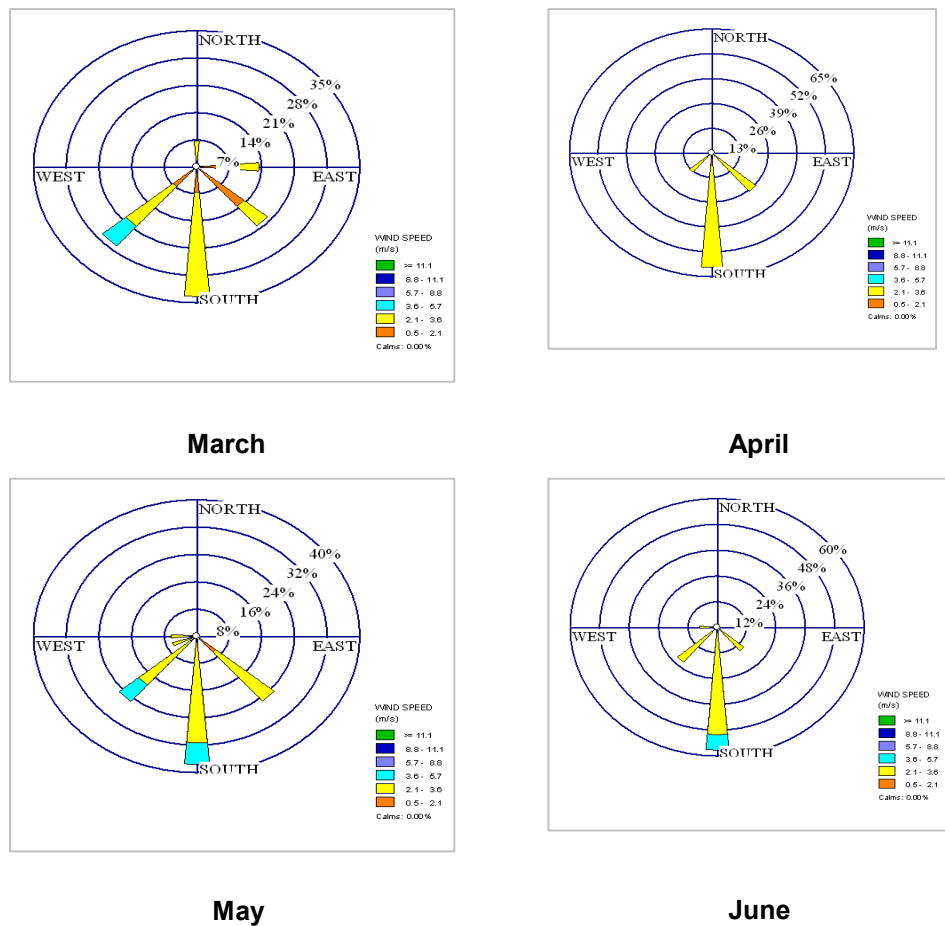
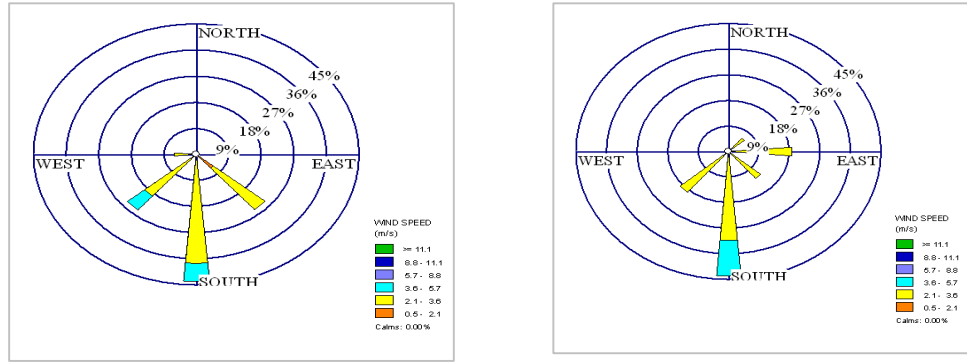


Figure 7: January and February wind roses

From March to August, the winds are mainly from the South Quadrant with moderate speeds (2.1 to 3.6 m / s) (Figure 8).



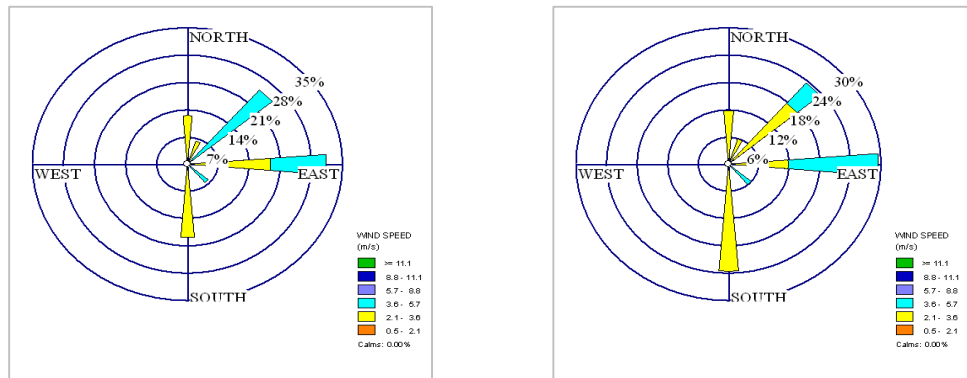


July

August

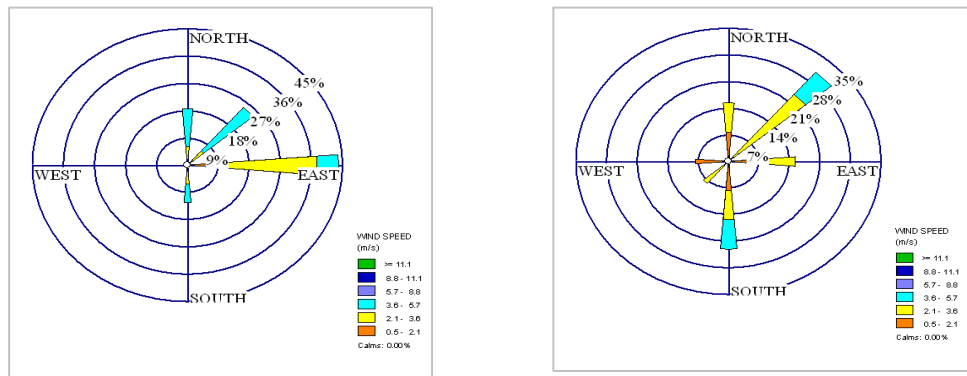
Figure 8: March to August wind roses

East / West Winds prevail during the months of September, October, November and December (Figure 9). The wind speeds during these months are slightly higher (reaching 5.7 m/s) compared to the rest of the year.



September

October



November

December

Figure 9: September to December wind roses

#### **5.1.4 Solar Radiation**

Mozambique has a high and consistent level of solar radiation throughout its territory, however detailed information about solar radiation is not available for Meconta District and Nampula Province.

#### **5.1.5 Lightning Days**

There is no data available for Meconta District and Nampula Province in terms of number of lightning days per year.

### **5.2 Geology, geomorphology and soils**

According to Editora Nacional de Moçambique (2009), the project area is located in an area characterized by intrusive structures and flattened blocks in the foothills that occur between Ilha de Moçambique and Meconta.

Figure 10 shows the geological features of the proposed area for the project where the dominant rocks are granite and different kinds of gneisses.

A13-36

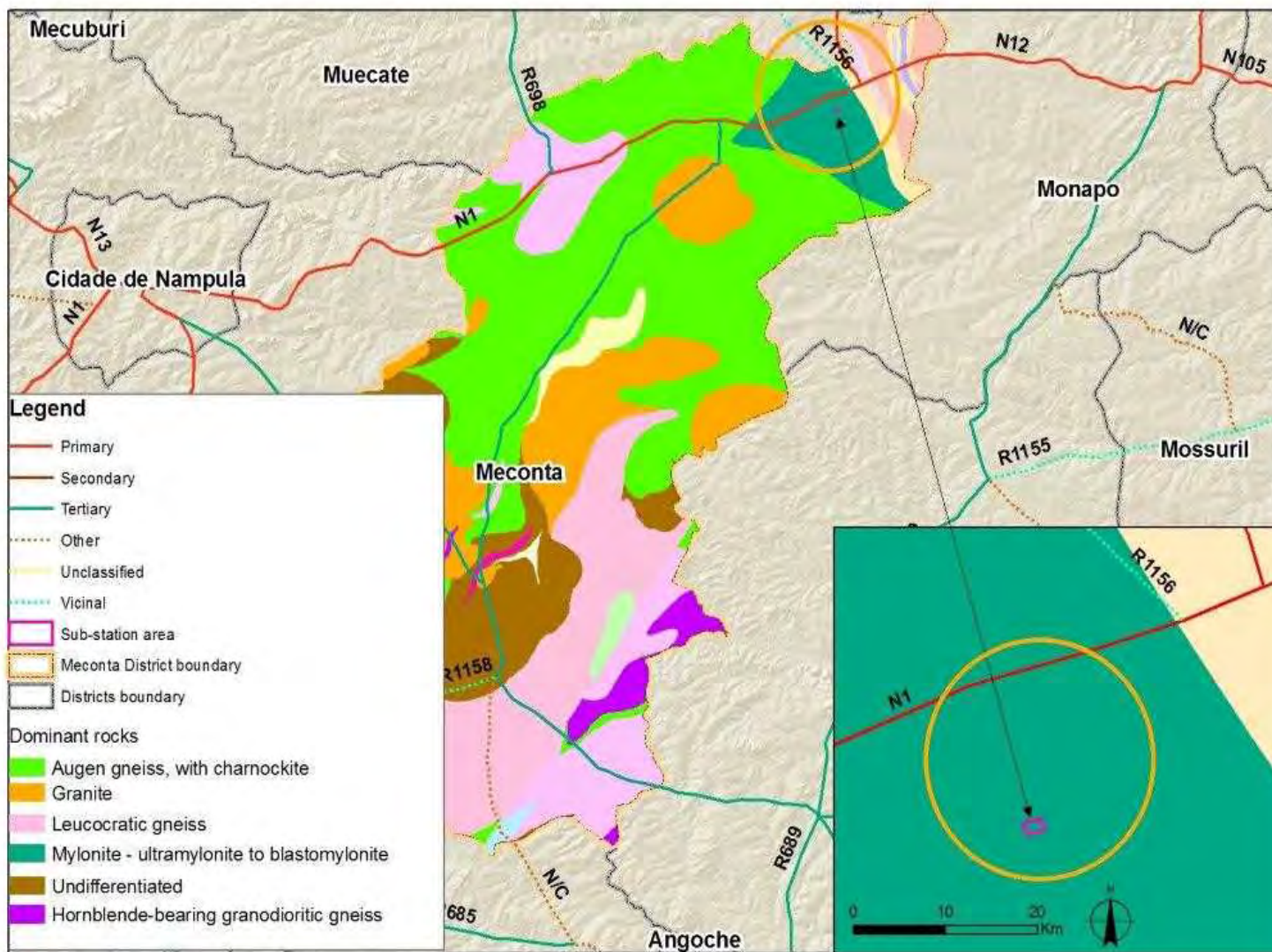


Figure 10: Geological features of the proposed project area

The geomorphology of Meconta district is characterized by the presence of lowlands that are crossed by some rivers (some of which perennials). The terrain topography rises from the coast to the interior gradually moving towards a more uneven relief with steep slopes at the sub-plateau zone in the interior of the province (Figure 10).

The coastal area is characterized by the presence of sandy soils and coastal dunes. The project's area is characterized by the presence of reddish soils, shown in Figure 11 as soils VM (medium textured soils) and VG (red clayey soils) or an association of both (VG+VM). These red soils are Ferric Lixisols in the FAO soil taxonomy classification. They are generally deep (with a depth greater than 100 cm), with good drainage and moderately fertile, however red soils are considered to have a high risk of erosion.

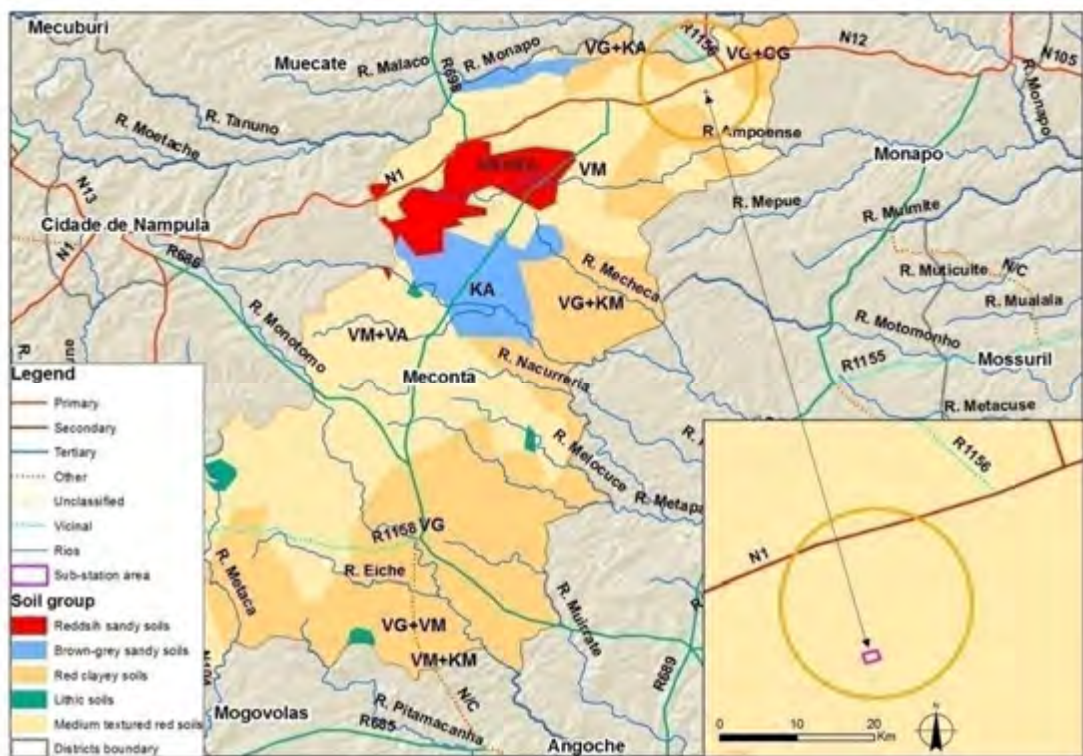


Figure 11: Soils in the proposed project area

### 5.3 Hydrology

#### 5.3.1 Surface water resources

In terms of surface waters the study site is enclosed by the basins of the Monapo river (Figure 12), which starts in the district of Lalaua and supplies the Nampula city and the village of Monapo, including the banana farming of Matanuska.

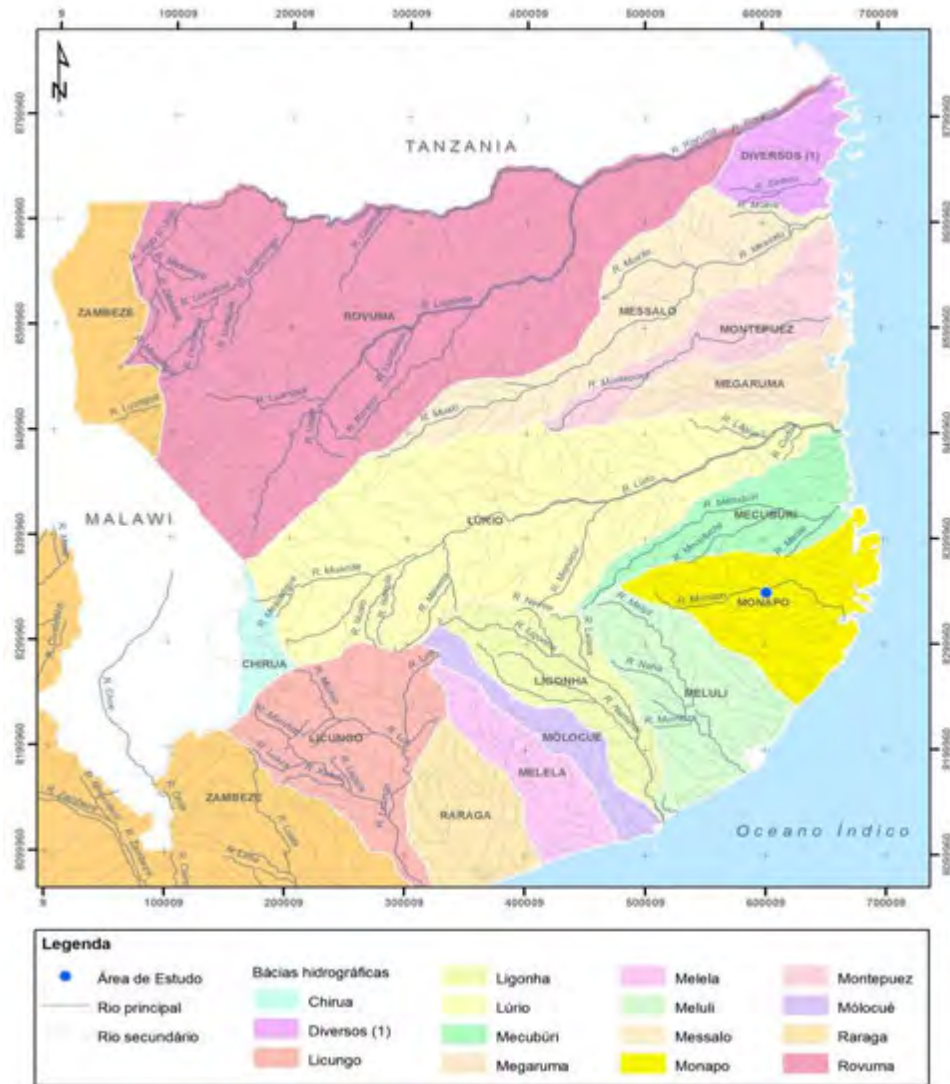


Figure 12: Basins in the northern part of Mozambique

Figure 13 shows that in the close vicinity of the project site, there are two main rivers namely the Monapo River (approximately 4 kms away) and Ampoense river (approximately 7 kms away).



The village of Namialo has a water supply system which is currently not functioning due to degradation of the infrastructure and thus, the majority of its population relies on other sources for water for domestic consumption, such shallow wells and boreholes such as the one existing in the area of the future project.

### **5.3.2 Ground water resources**

In terms of groundwater resources, the area of study is located in the hard rock province which is generally characterized by low groundwater potential due to low porosity and permeability of the geological formations occurring in the region. However, when the fresh rock is sufficiently weathered and fractured it can possess good hydraulic conditions to store enough water to supply enough water for domestic consumption.

### **5.3.3 Flooding**

According to the Chimuará-Nacala Transmission Project (2013), Meconta district have a moderate level of risk of flooding. This is based on the fact that flooding risk increases with the proximity to the coast due to the increase of in flow and due to the land becoming flatter. According to the interviews undertaken with local residents, the area is often severely affected by droughts. Although Nampula province is commonly known for its flood and drought cycles, the local residents have not reported any severe case of flooding over the past 10 years.

## **5.4 Water Supply Infrastructure in the study site**

During the site visit, groundwater samples were taken at one point around the site. The objective of the exercise was to obtain suitable baseline information for surface waters to firstly understand the quality of the water. During the site visit, monitoring parameters such as pH, Temperature and Electrical Conductivity were measured on site. Samples were kept in a cool environment, in a container with temperatures below 25°C. Biological sampling was not appointed as a requirement for this project.

In the area of study there is a shallow well which is equipped with a hand pump with a depth of approximately 5 m. The characteristics of the water quality are given below, namely measured in situ (Table 2) and determined in the laboratory. The parameters conform with the Regulations on Water Quality for Human Consumption, approved by Ministerial Diploma 180/2004 of 15 September regulations applied in Mozambique and thus, the water of the borehole can be classified as potable.



**Table 2: Water Quality of the borehole water existing in the study site (in the Field).**

Parameter	Value	Maximum Limit	Brief Observations (In accordance with Ministerial Diploma 180/2004)
Temperature	27.6 °C	n/a	This is the temperature range of potable water.
Electrical Conductivity (EC)	90 µs/cm	50 - 2.000 µs/cm	The value is below the limit recommended.
pH	8.7	6,5 - 8,5	Water is slightly basic (slightly above the considered value)
Total Dissolved Solids	44.40 mg/L	1000 mg/L	The value is below the limit recommended.
Total hardness (as CaCO <sub>3</sub> )	< 1.000 mg/L	500 mg/L	The value is below the limit recommended.
Chloride (Cl <sup>-</sup> )	12.346 mg/L	250 mg/L	The value is below the limit recommended.
Nitrate nitrogen	1.139 mg/L	10 mg/L	The value is below the limit recommended.

#### 5.4.1 Temperature

The water sample temperature was 27.6 °C. Temperature values are known to be dependent on the climatic conditions at a particular geographical area and the period that the sample is taken.

#### 5.4.2 Electrical Conductivity

Electrical Conductivity is a measure of the ability of an aqueous solution to carry an electric current and it measures the ionic content of the water and the water sample presented a value of 90 µs/cm. According to the Regulations on Water Quality for Human Consumption, approved by Ministerial Diploma 180/2004 of 15 September, electrical conductivity should range between 50 - 2.000 µs/cm. The water sample values show that the water is good for drinking purposes (provided there is no organic pollution and not too much suspended clay material).

### 5.4.3 pH

The pH value is an important index of acidity or alkalinity and the concentration of the hydrogen ion in groundwater. The pH value recorded was 8.7. According to the Regulations on Water Quality for Human Consumption, approved by Ministerial Diploma 180/2004 of 15 September, pH is a physical parameter that should fall in the range between 6,5 and 8,5. Water with a pH above 8.5 is considered basic or alkaline and it is often referred to as hard water. This kind of water (hard water) does not pose a health risk.

### 5.4.4 Total Dissolved Solids

Total dissolved solids (TDS) is comprised by inorganic salts and some small amounts of organic matter that are dissolved in water. In general, the TDS is the combination of cations and anions ions in the water. The maximum limit according to the Regulations on Water Quality for Human Consumption, approved by Ministerial Diploma 180/2004 of 15 September for TDS is 1000 mg/L. The water sample has presented a value of 44.40 mg/L. The most important aspect of TDS with respect to drinking water is its effect on the taste or palatability of the water. The palatability of drinking water with a TDS below 600 mg/L is considered to be good.

### 5.4.5 Total Hardness

Hardness is the property that makes water capable of precipitating soap. Water becomes hard by being in contact with soluble metallic cations such as calcium (Ca) and magnesium (Mg). The maximum limit according to the Regulations on Water Quality for Human Consumption, approved by Ministerial Diploma 180/2004 of 15 September for Total Hardness is 500 mg/L. The water sample presented a value of less than 1.000 mg/L which is considered soft water. The water sample is therefore considered safe for drinking.

### 5.4.6 Chloride

Almost all natural waters contain ions such as chloride and sulphate. Chloride often originates from the dissociation of salts, such as sodium chloride or calcium chloride, in water. In drinking water, the salty taste produced by chloride depends upon the concentration of the chloride ion. The maximum limit according to the Regulations on Water Quality for Human Consumption, approved by Ministerial Diploma 180/2004 of 15 September for TDS is 250 mg/L. The water sample presented a value of 12.346 mg/L, therefore lower than the maximum limit established by the Regulations on Water Quality for

Human Consumption in Mozambique. It is important to note that chloride is an essential element as is the main extracellular anion in the body. It is now widely known that the chloride ion play an important role in renal function, neurophysiology and nutrition.

#### **5.4.7 Nitrate nitrogen**

Nitrogen is indispensable for all living things, as it is a vital component of protein. Excessive concentration of nitrate-nitrogen in drinking water can be detrimental to the health, particularly of pregnant and nursing women and infants. The maximum contaminant level established for nitrate nitrogen in a public water supply is 10 mg/L. The water sample has shown a much lower level, 1.139 mg/L. The level of nitrate nitrogen is therefore within the acceptable concentrations considered safe for human consumption.

#### **5.5 Air Quality**

Ambient air quality monitoring is not undertaken in Meconta District, so no data is available to verify the current status of ambient air quality. Despite this, it is expected that ambient air quality will be relatively good as there are currently no major sources of air pollution in the region.

Domestic wood burning and traffic along the road are the main activities that may affect the air quality in the area of influence.

#### **5.6 Noise Level**

The overall District of Meconta is predominantly rural. There is no data regarding measurements for existing noise levels within the district, but it is expected that existing ambient noise levels in this predominantly rural area are low.

The main noise source within and around the project area is the vehicular traffic from the EN12 highway.

#### **5.7 Waste Management**

According to a telephonic conversation conducted with the local structures in Meconta, there are no adequate facilities for the collection and disposal of domestic and construction wastes. Most of the waste produced by the local community in the area is biodegradable waste that is presently buried or burnt (informally managed).

The Project will produce a limited amount of solid and liquid waste during the construction phase, namely:

- Biomass cut when cleaning the land (trunks, branches etc.)
- Packaging (boxes used to transport angle frames and insulators, rolls for cables, cement sacks, etc.);
- Leftovers and defective parts of conductor cable, broken insulators etc.;
- Waste produced by equipment maintenance (filters, burnt oil etc.)
- Solid waste from the workers' camps;
- Grey and sewage water produced in the camps.
- Demolition of transmission towers

The domestic waste produced during the lifecycle of the project may be divided into biodegradable and non-biodegradable waste. The former (biodegradable waste) can be buried in a suitable pit and covered with topsoil, with a layer of lime spread 0.5m below the surface. The latter (non biodegradable waste) as well as non-toxic waste may require a dedicated landfill site. For the construction phase, the contractor shall establish, if deemed necessary, a dedicated landfill site for the waste generated by the project. If hazardous wastes are produced within the lifecycle of the project, these will need to be transported to the Mavoco landfill in the Matola Municipality, Maputo Province.

Due to lack of adequate landfill /disposal facilities near areas with recent economic developments, investors are being advised to construct landfills designed to receive certain project wastes, particularly for non-hazardous wastes. Another possible solution for projects that produce great amounts of waste is the use of incinerators for the treatment of non-hazardous combustible wastes as well as certain hazardous wastes. Both options (construction of landfill site and incinerators) are being chosen as efficient solutions for the management of waste in small as well as large-scale projects such as the Liquefied Natural Gas project in Cabo Delgado.

Only a small amount of solid waste will be generated all during operation phase. It will result from the replacement of broken parts, maintenance of the substation and a small amount of domestic waste from the few workers during the operation of the substation.

## 5.8 Habitats and Flora

The project area is located in the deciduous woodland miombo phytogeographic zone. According Wild & Barbosa (1967), the unit 27. Deciduous woodland Miombo - Discontinuous Dry Forest - Savanna Mosaic is a type of miombo that is restricted to Nampula Province. In the project area this woodland type has been transformed into open bush land by slash and

burn agriculture. The main trees species are: *Brachystegia spiciformis*, *Adansonia digitata* (baobab) and *Sterculia appendiculata*.

Most of the natural habitats originally occurring in the Project area have been transformed by human activity mainly clearing of woodland for small-scale farms and harvesting of trees for firewood and charcoal production. Consequently there are very few remnants of semi-natural habitats occur in the project area. Tree species that may occur as isolated remnants of semi-natural habitats include: *Brachystegia* spp., *Julbernardia globiflora*, *Combretum* spp., *Albizia versicolor*, *Ficus* spp., *Terminalia sericea*, *Strychnos innocua*, and *Bauhinia thronningi*. No species considered to be rare or endangered were identified in the remnant woodlands.

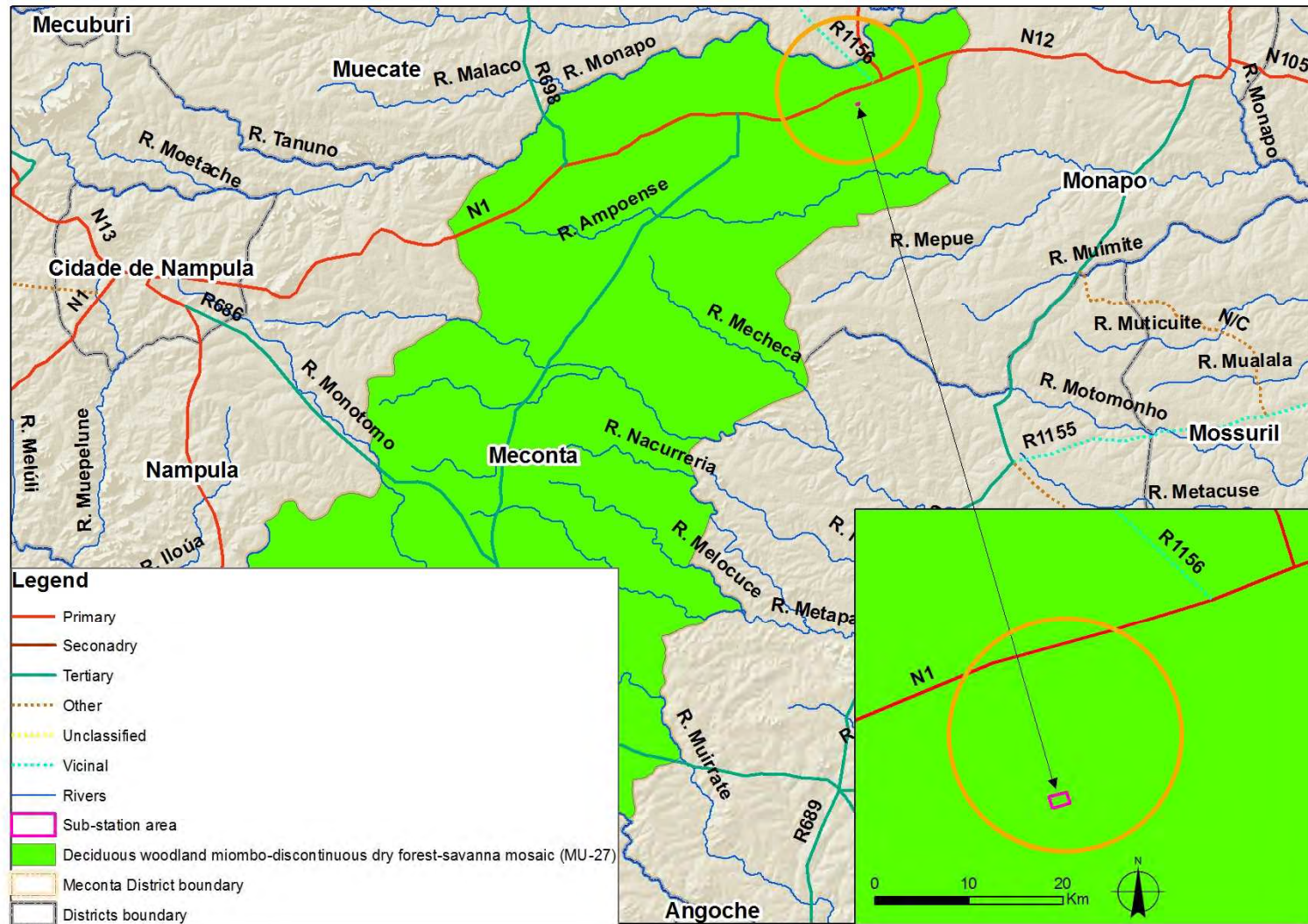


Figure 14: Vegetation of the proposed project area

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## 5.9 Fauna

A national wildlife survey carried out in 2008 out covering most of Mozambique. using aerial surveys along transects also confirmed the absence of medium to large wildlife species in the Project area (Agrego, 2008). The low diversity of wildlife is expected as the Project area coincides with areas of very high vegetation clearance and cultivation.

No medium size or large mammals were recorded during the field survey. This is due to the highly fragmented and disturbed nature of habitats present in the study area. The Provincial Services of Forestry and Wildlife have previously confirmed that the Project area is depleted of wildlife and that no large mammals migration routes are reported for the Project area. During the site visit, there was no record of herpetology, avifauna or reptiles, however local residents have reported the presence of small mammals and reptiles in the area.

## 5.10 Areas of Special Importance

There are three main areas of special importance that are relatively far from the proposed area of study: Mecuburi Forest Reserve, Baixo Pinda Forest Reserve and Matibane Forest Reserve. The location of these Forest Reserves are far away from the project area as shown in Figure 15.



Figure 15: Areas of special interest in relation to the proposed project area

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## 6 DESCRIPTION OF THE SOCIOECONOMIC ENVIRONMENT OF THE PROJECT AREA

A socio-economic description will be provided in this chapter. In Mozambique, the regular interval between censuses is of ten years and the last national census was conducted in 2007. Information provided in this chapter will be based on the 2007 National Census data.

### 6.1 Geographical Location and Administrative Division

Meconta is a district, situated in the Nampula Province. The district also borders the districts of Muecate (to the North), Mongicual and Mogovolas (to the South), Monapo (to the East) and the district of Nampula (to the West). Meconta district is divided into four administrative posts, which are in turn sub-divided into six localities (Table 3).

**Table 3: Administrative Division of Palma District**

Administrative Post	Localities
Meconta	Meconta-Sede
Corrane	Corrane- Sede
	Mecua 1
	Mecua 2
Namialo	Namialo
7 de Abril	7 de Abril- Sede

*Source: Impacto, 2014*

At district level, the government structure follows the type of district governance laid down by Decree no. 6/2006 of 12 April, on the organic structure of district governments. Under this decree, the district is headed by an Administrator. Under the Administrator are the district Permanent Secretary and the directors of the district services of Health, Women's Affairs and Social Welfare; Education, Youth and Technology; Planning and Infrastructures; and Economic Activities.

In the administrative posts and localities, the top authorities are the Heads of the Administrative Posts and Heads of Localities, who are hierarchically subordinate to the District Administrator. At grass roots level (Localities and Villages) a traditional structure prevails where power is exercised by community leaders (Régulos).

## 6.2

**Demography**

According to National Population Census 2007 (INE; 2009), Nampula is the most populated province in Mozambique with 4,076,642 inhabitants, of which 1,999,958 men and 2,076,684 women. Nampula covers 81.606 km<sup>2</sup> and has a population density of 50 inhabitants/km<sup>2</sup> (INE, 2007).

Table 4 shows key demographic indicators for Nampula province and for the country.

**Table 4: Demographic indicators refer Nampula Province for 2007**

Demographic indicators	Nampula Province	Mozambique
Life expectancy (years)	52.7	49.4
Child mortality rate (per 1000)	126.7	118.3
Mortality rate (1000)	14.9	16
Birth rate (per 1000)	41.3	42.2
Global Fertility Rate	5.9	5.9

*Source: Recenseamento Geral da População e Habitação 2007 (INE, 2009)*

Based on the Nampula Province demographic indicators and national indicators, life expectancy is higher in Nampula than in the rest of the country. As for the gross death and birth rates, these are lower than the national average. However, there is a reduction in these rates in Nampula province in 2009. According to information from the Provincial Health Directorate, the death rate in the province has fallen to 11.9 per 1,000, and the birth rate to 39.4 per 1,000.

Meconta District has a surface area of 3,786 km<sup>2</sup> and the latest census<sup>1</sup> indicates a total population of 174,358 (INE, 2011). The population density for 2011 of this district stands at 46 hab/km<sup>2</sup>. It is estimated that the projections for population in 2014 stand at 182,581, therefore approximately 49.1 hab/km<sup>2</sup> ( $\pm 39,676$  households). Approximately 53% of individuals in the district comprise the economically active population in the 14 - 64 age group (Table 8-5).

Table 5 shows the population density for the Administrative Post of Namialo.

**Table 5: Demographic information for Namialo**

Administrative area	Men		Women		Total
	N.º	%	N.º	%	N.º
Namialo A.P.	25271	50	25199	50	50470

*Source: Recenseamento Geral da População e Habitação (INE, 2011)*

<sup>1</sup> 3rd General Population and Housing Census – Census of 2007

The Namialo Administrative Post has the same proportion of men as of women (50%).

### 6.2.1 Ethno-linguistic Groups and Religion

Regarding ethnic groups, the data from the 2007 Census on mother tongues shows that the Emakhuwa ethnic group is dominant in Nampula province. The Emakhuwa ethnic group is represented by 2,777.013 inhabitants (69.7%), followed by the coti ethnic group, with 60,780 inhabitants (1.8%) in Nampula Province.

There is one major ethno-linguistic groups in Meconta District, namely the Makuwa, being *Emakhua* the main spoken language in the area. As for religion, Islam is dominant, but Christianity is also practiced.

### 6.3 Settlement Patterns

In Meconta, an average household size is between 3 and 5 persons. Although it is a matrilineal society, the majority of the households are still headed by men.

Basic housing is made of clay bricks (*adobe*) and the roof is often topped with grass or thatch that is locally called *macuti*. This kind of housing is known as *pallhota*.

Houses with adobe walls, owned by 66% of families, and mud and wattle houses inhabited by 28% of households. Other types of house are insignificant (1% have cement walls and 0,3% brick houses). Roofs with grass or thatch are mainly used by the local community, accounting for 91% of the households.

### 6.4 Road and Transport

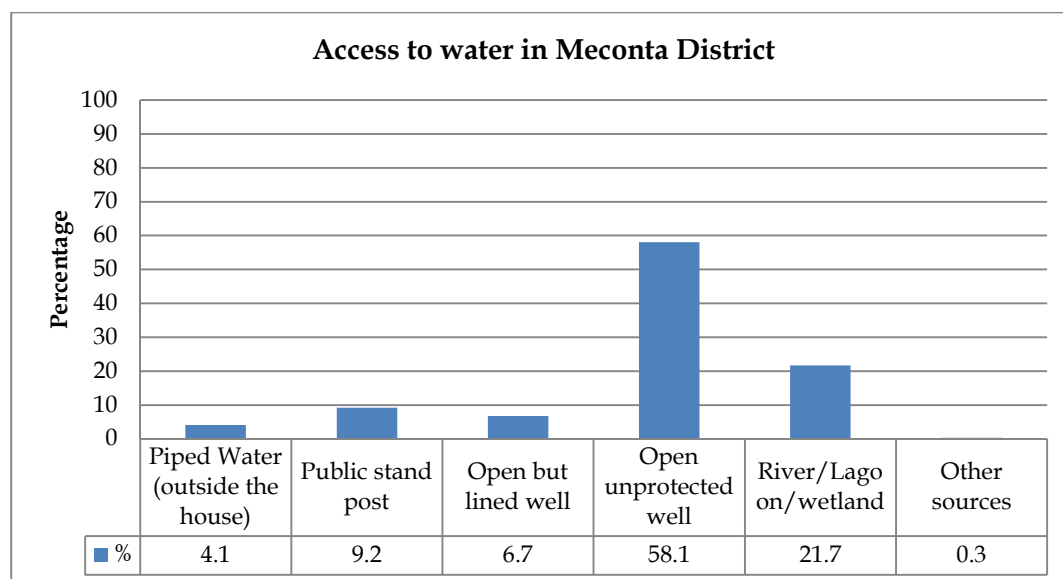
In general, the areas affected by the project own a network road in good transitivity conditions. Essentially the public transport network in the study area is dominated by semi-collective transport (private minibuses known colloquially as *chapas*) and public transport.

### 6.5 Collective Services and Amenities

Information regarding collective services and amenities was based on the Environmental Impact Assessment for the Chimuará-Nacala Transmission Project SCDS (2013).

### 6.5.1 Water Supply

Access to potable water in Meconta is still very weak. In 2007 only 0.16% of the 39 thousand households had piped water in the house. People get water mainly from wells that support 58% of households. They are complemented by water from rivers and lakes where 21% of households get their water. There are a few standpipes and protected boreholes, supplying 9% and 6% of households respectively. Figure 16 provides an overview of access to water in Meconta in 2007.



**Figure 16: Access to potable water in Meconta District**

### 6.5.2 Sanitation

In general, the sanitary system of rural areas affected by the project is characterized by traditional latrine. Basic sanitation in Meconta district is similar to that in the other districts in Nampula. Of the 39 thousand households, 57% do not have a latrine. A further 38% of families use standard traditional latrines compared to a little over 2% of families who have an improved traditional latrine.

### 6.5.3 Energy Supply

Much of the population resident in existing villages along the stretch under study does not benefit from electrical energy from Cahora Bassa, which only supplies the district capitals and some administrative posts.

In 2007 access to energy sources in Meconta district was as follows:

- Kerosene and firewood predominate, with 59% and 34% of families respectively;
- A little over 4% of households have electricity;
- Other alternative sources of energy such as candles, gas, solar panels and others are rare

#### 6.5.4 Communications

Three mobile communication networks are operating in Meconta District, namely Mcel, Vodacom and Movitel. Coverage of the first two networks is, good. The newly established Movitel covers most parts that are not covered by Mcel and Vodacom. No land-based telephone network exists within the district. No information regarding telephone and internet subscribers is available.

#### 6.6 Education

In 2007, the illiteracy rate among people over 15 years of age was 53%, slightly below the provincial average. In 2010 the primary and secondary gross enrolment rates were 118% and 28% respectively, with participation by girls 47% (Primary School) and 34% (Secondary School).

#### 6.7 Health

The sanitary network in the Meconta district consists of 6 health centres and one health post (Table 6). Approximately 47 people working in the health service.

**Table 6: Number of health units in the Meconta District**

Administrative area	Type of health unit	
	Health centres	Health Posts
Meconta District	6	1

According to the 2007 Census (INE, 2009), malaria, HIV/AIDS and ante-natal causes are the main causes of death in Mozambique. Malaria is responsible for 28.8% of deaths, followed by HIV/AIDS with 26.9%. In general, this picture is repeated in Nampula province. According to information from the Nampula Provincial Health Directorate, the main causes of death in the province are malaria, diarrheal diseases and HIV/AIDS.

#### 6.8 Economic Activities

The principal economic activity developed by the population in the study area is agriculture. There are, however, other important economic activities that

contribute to the monthly income of local communities in the Meconta District.

### 6.8.1 Agriculture

This activity is developed by the family sector for self-subsistence and is, essentially, rainfed agriculture. This agriculture follows a calendar that is divided between a number of activities such as burning/clearing, sowing, weeding and harvesting (Table 7).

**Table 7: Agricultural Calendar**

Activities	Burning/ clearing	Sowing	Weeding	Harvesting
Jan				
Feb				
Mar				
Apr				
May				
Jun				
Jul				
Aug				
Sept				
Oct				
Nov				
Dec				

Source: Interviews with the villages, 2014

Cassava is the predominant food crop along the entire stretch and plays an important role in the diet of families. Besides cassava, people grow other food crops such as maize, rice, sorghum, peanuts, horticultural crops, and beans. Besides their function for self-subsistence, these crops are also income crops since the families sell their surpluses. In adjacent areas, other income crops grown by the population are cotton, tobacco, sesame, castor beans, beans, cashew, and jatropa.

### 6.8.2 Other economic activities

According to MSA (2005), the Meconta district has large tracts of bush and forest containing timber species of considerable commercial value such as *Milletia stuhlmani* (jambirre), *Azelia quazensis* (chanfuta), *Dalbergia melanoxylon* (umbila) and *Pterocarpus angolensis* (pau preto). Other species that have a lower commercial value are used to make charcoal. The cashew tree (*Anacardium*

*occidentale*) is very important for providing families with an income (MSA, 2005).

Small industry is the alternative to agriculture and is a complement to augment a family's income. There are 19 mills, 9 workshops of different kinds, 3 service stations, 3 bakeries and 2 sawmills. The commercial industrial sector comprises SANAM cotton ginning factories, the ACAI biscuit factory, and the CFM-North quarry and sawmill (MSA, 2005). Eight percent of the economically active population is wage earning.

## ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION MEASURES

This Chapter discusses the environmental and social impacts that may result from the proposed Project. Potential impacts are identified, the nature and significance of the impacts are determined, and mitigation measures provided.

The main objectives of the EIA process are as follows:

- to identify and assess the main potential environmental impacts (negative and positive) of the proposed project, taking into account the biophysical and socioeconomic domains; and
- to identify the mitigation, environmental management and environmental monitoring measures that will allow for minimizing potential negative impacts and to enhance potential positive impacts of the project, so as to ensure that it can be implemented in an environmentally sound manner.

It is worth recalling that not all impacts are negative and that positive impacts can also be expected, which will bring benefits to the society and the economy of Mozambique.

The methodology proposed for identification and assessment of the potential impacts is outlined below.

### 7.1 Impact Assessment Methodology

An impact assessment is based on a comparison of environmental scenarios, *viz.* the existing scenario prior to project implementation (baseline situation) and the expected scenario after project implementation. The assessment of impacts proceeds through an interactive process considering the following criteria:

- **Nature** (positive or negative impact);
- **Probability** (possibility of impact occurrence);
- **Extension** (the geographical area that may be affected by the impact);
- **Duration** (period along which the impact is expected to occur);
- **Magnitude** (effect on environmental and social processes);
- **Significance** (the level of importance of the impact).

The categories to be considered for each of the criteria above are indicated in the Table 8 below.



**Table 8: Criteria for assessment of potential impacts of the project**

<b>CRITERIA</b>	<b>DESCRIPTION</b>
<b>Nature</b>	<b>Nature of the environmental change</b>
Positive	Beneficial environmental change
Negative	Adverse environmental change
<b>Probability</b>	<b>Degree of possibility of impact occurrence</b>
Low	The possibility of occurrence is low, either due to the project design or due to the project nature, or due to the characteristics of the project area
Probable	There is possibility of impact occurrence
Highly Probable	Possibility of impact occurrence is almost certain
Definite	There is certainty that the impact will occur
<b>Extension</b>	<b>The geographical area that may affected by the impact</b>
Local	Only the place where the activities directly related to the construction and operation may occur, located within the boundaries of the study area
Regional	Project region - Administrative Posts adjacent to study area within Nampula Province
National	Mozambique
International	Mozambique and other countries (neighbouring or non-neighbouring countries)
<b>Duration</b>	<b>Period along which the impact is expected to occur</b>
Short-term	Less than 6 (six) months
Medium-term	Between 6 (six) months and 5 (five) years
Long-term	Project's lifetime
Permanent	The impact remains beyond the activity's lifetime, regardless of implementation of mitigation measures
<b>Magnitude</b>	<b>Effect on environmental and social processes</b>
Low	Small effect on the functioning of environmental and social processes
Moderate	Functioning of environmental and social processes is moderately affected
High	Functioning of environmental and social processes is considerably affected

All human activities impose some type of disturbance to some features of the natural and social environments, either in the form of a change in the natural systems or due to interactions with other human activities or with human systems. The assessment of **Significance** helps inform the relevant authorities and the public about the relative importance of the different impacts of the project. The assessment of impact significance results from a combination of the criteria above indicated, in particular Extension, Duration and Magnitude, as shown below in the Table 9.

**Table 9: Criteria for assessment of significance of potential impacts of the project**

Significance	Relation with the other criteria that describe the impact	Relation with mitigation measures
Negligible	- Low Magnitude, with any combination of other criteria.	- No further investigation, mitigation or environmental management is required.
Low (Low Significance Impact)	- Low Magnitude, with any combination of other criteria (except for Long-term Duration and National or International Extension); - Moderate Magnitude, with Local Extension and Short-term Duration.	- No specific mitigation is required, though it is subject to best environmental practices.
Moderate (Significant Impact)	- Low Magnitude, with National or International Extension and Long-term Duration; - Moderate Magnitude, with any combination of other criteria (except for: Local Extension and Short-term Duration; and National Extension and Long-term Duration); - High Magnitude, with Local Extension and Short-term Duration;	- Mitigation and Management is required to reduce the impact to an acceptable level (applicable to negative impacts).
High (High Significance Impact)	- Moderate Magnitude, with National or International Extension and Long-term Duration; - High Magnitude, with any combination of other criteria (except for Local Extension and Short-term Duration)	- If the impact cannot be mitigated/managed, it should influence decision as regards to particular aspects of the project (applicable to negative impacts).

This approach to impact assessment aims at minimising the subjectivity inherent to the evaluation of Significance. It is worth noting, however, that the context of the impact (i.e. the identity and the characteristics of the impact receptor), as well as compliance/non-compliance with norms, standards or legal instruments, must also be taken into account. Therefore, the use of this methodology also always has to take into consideration the specific conditions

that may apply to each impact, regardless of the proposed combinations of Extension, Duration and Magnitude.

The objective of an impact assessment is also to define technically acceptable, practicable and cost-effective mitigation measures for the environmental and social impacts identified. The overall purpose is to avoid unnecessary damage to the environment; safeguard valued or finite resources, natural areas, habitats and ecosystems and protect humans and their social environments.

Mitigation measures are developed to avoid, reduce, remedy or compensate for any negative impacts identified and to create or enhance positive impacts such as environmental and social benefits. In this context the term "Mitigation Measures" includes operational controls, as well as management actions. These measures are often established through industry standards and may include:

- Changes to the design of the project (e.g. changing the development approach for some specific project components);
- Engineering controls and other technical measures (e.g. waste water treatment facilities, communication procedures, etc.);
- Operational plans and procedures (e.g. waste management plans; safety procedures);
- The provision of like-for-like replacement, restoration or compensation, directed towards particular environmental elements potentially affected by the project.

Where significant residual impacts remain, further options for mitigation may be considered and impacts re-assessed, until they are as low as reasonably practicable for the project.

## 7.2 Pre-construction Phase

A Simplified Land Use Compensation Plan (SLUCP) was done as a subcomponent of the ESCS in order to address the social impacts and ensure the successful restoration and improvement of living standards, income earning capacity and production levels of the Project Affected Persons (PAP). The implementation of the SLUCP should be done prior to the construction phase (pre-construction phase)

### 7.3 Construction Phase

#### 7.3.1 Soils and Relief

##### Changes in relief of landscape

The proposed project may cause changes in relief during construction phase. Levelling in the study area will be necessary for the substation to be built. Also, the opening of borrow pits for sand extraction for cement and construction work is also likely to cause some changes in relief.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Protection with terraces and vegetation.</li> <li>• Rehabilitation of borrow pits after use.</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Medium-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

##### Increase of Soil Erosion and/or compaction due to construction activities

Construction activities have the potential to cause soil erosion and/or compaction as well as soil pollution. Erosion may result from the movement of heavy machinery, the removal of the vegetative cover and exposure of the soil surface. Erosion of the soil and run-off from construction materials could also cause and/or increase turbidity and siltation of the water bodies in the surrounding areas.

There are possibilities of soil erosion occurring during the construction of the proposed Namialo substation especially during rainy seasons. The soils in the area are susceptible to erosion. Even footpaths can become channels due to the strength of the flow. Therefore, footpaths that lose their vegetation cover can become water channels at a later stage.

Due to the fact that the duration of the construction activity is short and the proposed project area is small the significance of this impact may be low, if mitigation measures are implemented.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Minimize work in the rainy season.</li> <li>• Limit access to the project area to the necessary minimum and remove as little vegetation as possible.</li> <li>• Avoid creating large open expanses of bare soil as these are most susceptible to wind and run-off erosion. In such areas, if necessary, create windbreaks should (e.g. a tree screen).</li> <li>• Suitable drainage systems should be installed to direct water and prevent waterlogging and erosion.</li> <li>• After construction, all non-paved areas should be reinstated with the topsoil to allow the reestablishment of the indigenous herbaceous vegetation.</li> <li>• All bare areas should be re-vegetated as soon as possible.</li> <li>• All vehicles and machinery should only use indicated routes and access roads.</li> </ul>
<i>Probability</i>	Probable	
<i>Extension</i>	Local	
<i>Duration</i>	Medium-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

### 7.3.2

#### Air Quality

##### Air Pollution Resulting from Emission of Pollutants from transportation and construction activities

The Project may cause some changes in air quality, during construction phase, due to: (1) potential for generation of dust (particulate matter such as PM<sub>10</sub>) from transportation and construction activities and (2) emissions from machines such as (CO, NO<sub>2</sub>, SO<sub>2</sub>) related to the transport of material to and from the site and the use and movement of heavy machinery during the construction phase.

This environmental impact is considered to be relatively small due to the limited duration of the construction works.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Good maintenance of engines, vehicles and machinery</li> <li>• Use new, modern machinery and vehicles.</li> <li>• Repair and eventually replace machinery and vehicles when they exceed norms.</li> <li>• Loads on vehicles carrying dusty construction materials should be covered.</li> <li>• Loading and unloading bulk construction should be in areas protected from the wind on in calm conditions.</li> <li>• Vehicles carrying dusty materials should be washed before leaving the site (washing facilities should be available).</li> <li>• Limit access to construction site to construction vehicles only. Impose vehicle speed restrictions on the construction site.</li> <li>• Maintain high moisture content on exposed surface and roads by spraying with water.</li> <li>• Maintenance of construction vehicles to ensure optimum performance with reduced emissions.</li> </ul>
<i>Probability</i>	Highly probable	
<i>Extension</i>	Local	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

### 7.3.3

#### Hydrology

##### Changes to runoff

During the construction works, there will be garbage and effluents generated by the workers and resulting from the maintenance of equipment which has to be disposed appropriately as to avoid the contamination of the soil and water resources (both surface and groundwater).

The Project will create impermeable areas at a local scale near substations to guarantee that oil leaks from transformers do not contaminate soil and groundwater.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Maintain machinery and vehicles in workshops with sealed floors during all Project phases;</li> <li>• Collect waste oils in designated containers and transport them designated disposal/recycling site</li> <li>• Do not dispose untreated wastewater;</li> <li>• Monitor the impact of local erosion due to the flow and, if impact is significant reduce run-off</li> </ul>
<i>Probability</i>	Low	
<i>Extension</i>	Local	
<i>Duration</i>	Medium-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

### 7.3.4

#### Waste

Production of waste

The Project will produce a limited amount of waste during the construction phase, namely:

- Biomass cut when cleaning the land (trunks, branches etc.)
- Packaging (boxes used to transport angle frames and insulators, rolls for cables, cement sacks, etc.);
- Leftovers and defective parts of conductor cable, broken insulators etc.;
- Waste produced by equipment maintenance (filters, burnt oil etc.)
- Solid waste from the workers' camps;
- Grey and sewage water produced in the camps.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Minimise the use of disposable materials.</li> <li>• Train workers how to minimize and treat waste.</li> <li>• Dedicate resources to collecting, sorting, depositing, reusing and recycling according to norms (section 2.4), with special emphasis to metallic waste.</li> <li>• Avoid spillage of waste oil and others</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local to Regional	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low to Moderate	

Generation of waste from demolition of transmission towers

The demolition of three transmission towers will be carried out and this will produce large amount of metal waste.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Minimise the use of disposable materials.</li> <li>• Train workers on how to minimize and treat waste.</li> <li>• Dedicate resources to collecting, sorting, depositing, reusing and recycling, with special emphasis to metallic waste (section 2.4).</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

## 7.3.5

**Noise and Vibration**Increase in noise and vibration levels due to transportation and construction activities and demolition of transmission towers

The study area is a relatively tranquil area. During construction the four main sources of noise and vibration are: (a) noise produced by vehicles transporting equipment, material and workers; (b) Noised produced by chainsaws or other machines when cutting down trees; (c) noise produced by machines involved in the construction work for the substations; (d) noise produced from demolition of transmission towers. To avoid public nuisance and complaints and occupational hazard to the employees, mitigation measures need to be put in place.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Transportation of workers, equipment and materials should be undertaken during the day, especially in inhabited areas.</li> <li>• Use modern vehicles and ensure that these are well maintained.</li> <li>• Monitor the level of noise emissions and ensure they are within the applicable limits.</li> <li>• Repair and eventually replace machinery and vehicles when they exceed norms.</li> <li>• The Contractor should take measures to inform the communities about the start of the works and the time limit foreseen for their conclusion, the working hours established by law should be adhered to and respected. Work continuation during evenings, weekends and holidays should be minimized.</li> <li>• Whenever possible, machines and vehicles should be equipped with silencers.</li> <li>• Use noise barriers if necessary. When possible use natural noise barriers such as materials resulting from earthworks, trees.</li> <li>• All construction workers must be issued with the necessary protective equipment.</li> <li>• Construction work should be limited to the daytime (08:00-18:00) as far as possible, still a must for activities causing high noise/vibration.</li> </ul>
<i>Probability</i>	Highly Probable	
<i>Extension</i>	Local	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	Low	

### 7.3.6

#### Flora and Fauna

##### Loss of flora and fauna due to construction activities

For the construction of the substation and access road it will be necessary to clear the lane for construction of the substation. It should be noted that the habitats in the Project area have largely been degraded and replaced by small-scale farms. Hence the impacts on any residual habitats, flora and fauna will be minimal.



Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>Restrict the access of the Contractor particularly outside of the area where the project will be implemented and reduce the construction work area to a minimum in these areas.</li> <li>Guarantee the contractor has a license for clearing vegetation.</li> <li>Limit cutting of trees to the site only.</li> <li>All vehicles and machinery should only use indicated routes and access roads and therefore no off-road driving.</li> <li>Apply mechanical vegetation control measures.</li> </ul>
<i>Probability</i>	Probable	
<i>Extension</i>	Local	
<i>Duration</i>	Medium term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

### 7.3.7 Landscape and Visual

#### Change the visual of the landscape due to construction works

Construction works can be considered low aesthetic activity, although the appreciation of an object as good or bad looking is subjective. The visibility of construction activities depends on several aspects, namely size of work-site area and location in relation to the road. The construction work-site for the planned substation in Namialo is approximately 1.5 km from the nearest road, therefore it will not be very visible.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>Limit construction activities to the construction areas only to minimize visual and landscaping impacts</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Medium-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

### 7.3.8 Traffic and transport

#### Changes in the intensity and traffic flow due to trucks, extraordinary transport and others

The impact of traffic and transport will arise from the following activities:

- Construction of the temporary access roads;
- Delivering resources (materials, equipment and labour) to work sites.

All these activities require material, equipment and people to be transported, thereby increasing the amount of traffic. In addition to the impact on volume there are also:

- Constraints on traffic flows when transporting extra-large loads;
- Constraints on traffic flows when placing lines on road crossings;

The movement of heavy vehicles and equipment will be a factor of “disturbance” in terms of their interference with local traffic, especially as the all trucks that will be driving on the EN12 road. Based on the information available, the risks and impacts related to traffic and transport are likely to be as follows:

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Transport extraordinary cargo out of rush hours and if necessary accompanied by traffic police.</li> <li>• Place signs and safety barriers.</li> <li>• Educate workers to follow traffic rules</li> <li>• Reduce roadblocks to a minimum.</li> <li>• Ensure the load prone to dust is well covered.</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

### 7.3.9

#### Health

##### STI's in the population and workers safety and health

In the construction phase, there is a possibility for exposure to infectious diseases in interaction with employees (STDs including HIV/AIDS); It is likely that workers in the project area are exposed to the risk of other diseases such as malaria, HIV and diarrhoea.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Education of the public and workers on the risks and health hazards and legal norms, around infection, testing, and sexual behaviours.</li> <li>• Availability of condoms to employees and sales points around the camps.</li> <li>• Access to health services, medicines.</li> <li>• For the workers, ensure provision of mosquito nets, health facilities at camps, maintain a sufficient stock of medicines and prophylactics of first-line treatment of malaria, availability of clean water and adequate sanitary equipment.</li> </ul>
<i>Probability</i>	Highly Probable	
<i>Extension</i>	Local	
<i>Duration</i>	Short term to Long term	
<i>Magnitude</i>	Moderate to High	
<i>Significance</i>	Moderate	

##### Work accidents

Due to the type of construction work that will be carried out on site, there is a potential risk of injuries and work accidents that can occur, such as falling from heights, risk associated with demolition of transmission towers, excavations and exposure to occupational health risks. The contractor must therefore ensure that general health & safety awareness and the communication of risks, management controls and mitigation measures for

potential health & safety risks exposed to are adequately communicated and controlled.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Train workers in occupational safety and health. All contractor teams involved in works during the construction phase shall be briefed on their obligations towards health &amp; safety controls and methodologies. The briefing must take the form of a presentation and demonstration. The education / awareness programme should be aimed at all levels of management and general staff within the Contractor teams. An attendance register shall be signed at this briefing. Local labourers hired for the construction phase must receive training related to health &amp; safety awareness prior to commencement of the works.</li> <li>• All construction workers must be issued with the necessary protective equipment, in particular, helmets, safety shoes, ear plugs and goggles.</li> <li>• Periodical exercises and simulations.</li> <li>• Award good behaviour.</li> <li>• Train employees in first aid.</li> <li>• Reserve a vehicle for emergencies such as transportation of patients at work site.</li> </ul>
<i>Probability</i>	Highly Probable	
<i>Extension</i>	Local	
<i>Duration</i>	Short-term to Medium-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	Moderate	

### 7.3.10

#### Economy

##### Loss of crops, cropping areas and other economic opportunities

The site for the construction of the substations and access road will have to be cleared prior to construction. Most of the area is occupied by small scale farms and fruit trees. This will result in the permanent loss agricultural land and fruit trees. The effect of such losses and associated compensation are dealt with in the SLUCP.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Advise farmers before construction so that they can harvest their crops</li> <li>• Compensate for the value, land and opportunities lost in a compensation plan. To this extent a simplified land-use compensation plan (SLUCP) has been prepared and is presented as separate document to this SES.</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Long-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	Moderate	

Direct employment

The main economic impact will be the creation of local employment during construction of the substation, access road and establishment of two new towers. It is estimated that the labour requirements to build a substation is roughly 1020 people.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Positive	<ul style="list-style-type: none"> <li>• Prioritize the recruitment of local workers.</li> <li>• Use temporary employment for the training of local people.</li> <li>• Prioritize procedures of intensive hand labour instead of machines.</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local to Regional	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	Moderate	

Indirect employment due to induced development

During construction of the Project, the labour force will be concentrated in camps and places where the work will attract all kinds of service, thereby promoting indirect employment. The contractor's use of local equipment and service suppliers will also help generate indirect employment in this phase.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Positive	<ul style="list-style-type: none"> <li>• Prioritize local and national suppliers.</li> <li>• Invest in training of local service providers.</li> <li>• Connect the Project to investments.</li> <li>• Encourage investments that allow the recruitment of more local hand labour.</li> </ul>
<i>Probability</i>	Probable	
<i>Extension</i>	Regional	
<i>Duration</i>	Long-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Moderate	

**7.3.11****Tensions**High expectations with regards to employment opportunities

During the construction phase, there may arise high expectations in the surrounding communities with regard to the creation of unskilled job opportunities. These could be disappointed, as it is expected that a company with its own work force will be contracted for construction work.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>If local workers (non-specialized and/or semi-specialized) will be necessary, the project must as far as possible incorporate and maximize the use of local labour. This should be best coordinated with the local authorities and with the provincial Directorate of Labour.</li> <li>In the Contractor's contract, the number of work places to be opened for local staff should be stipulated, the hiring requirements, the maximum duration of the work, the recruitment procedures and wage levels.</li> </ul>
<i>Probability</i>	Probable	
<i>Extension</i>	Local to Regional	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	Moderate	

### Social conflict due to physical presence of external workers

During the construction phase, construction workers will be hired especially for skilled workforce. The exact number of the proposed project is, however, not yet determined. Workers will, naturally, interact with the local population, and conflicts may occur of a socio-cultural nature. However, given the relative isolation of the site, this impact is thought not to be very significant.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>Both, workers and local communities, should be subject to awareness-raising campaigns, so as to promote good relations, thus avoiding the occurrence of conflicts.</li> </ul>
<i>Probability</i>	Probable	
<i>Extension</i>	Local to Regional	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	Moderate	

## 7.4 Operation stage (post-construction)

### 7.4.1 Waste

#### Production of waste`

Only a small amount of waste will be generated all during operation phase. It will result from the replacement of broken parts, maintenance of the substation and a small amount of domestic waste from the few workers during the operation of the substation.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>Minimise the use of disposable materials.</li> <li>Train workers how to minimize avoid and treat waste.</li> <li>Dedicate resources to collecting, sorting, depositing, reusing and recycling according to norms.</li> <li>Avoid spillage of waste oil and others</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Long-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Moderate	

## 7.4.2

### Air Quality

#### Air Pollution Resulting from Emission of Pollutants from operation phase

During the operation phase, vehicles and equipment will be used for maintenance work, including the replacement of obsolete or broken parts, all of which may produce gaseous emissions.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>Good maintenance of engines, machinery and vehicles</li> <li>Use new, modern machinery and vehicles</li> <li>Repair and eventually replace machinery and vehicles when they exceed norms.</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

## 7.4.3

### Noise and vibration

#### Noise and vibration resulting from operation of substation

The noise and vibration produced by an operating substation can be relatively loud to adjacent property owners. A constant humming or buzzing noise may be audible at short distances from the substation fence. The sound may be especially noticeable during night-time hours when ambient noise levels are lower.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>A barrier of mature trees or high soil berms (green area) between the substation and nearby residences can be helpful in reducing noise impacts</li> </ul>
<i>Probability</i>	Probable	
<i>Extension</i>	Local to Regional	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	Moderate	

#### 7.4.4 Improved Energy Supply

The main benefit of the Project is improved power supply. There is a strong need for the electricity sector of Mozambique promoting the rehabilitation and reinforcement of the installed capacity of the existing substations, through the construction of new substations such as the Namialo, not only for maintaining the current capacity, but furthermore to guarantee the increase in capacity of electricity supply of a trustworthy source during future years.

Criterion	Rating	Mitigation/Enhancement measures
<i>Nature</i>	Positive	<ul style="list-style-type: none"> <li>Ensure integration of the Project in the investment strategies in the four provinces affected by the Chimuará-Nacala Transmission Project</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Regional	
<i>Duration</i>	Long-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	High	

#### 7.4.5 Economy

##### Direct employment

During the operational phase, direct employment will be very limited. Most of the direct employment will be skilled work and less than 10 people are estimated to work in the substation. Therefore, during the operational phase, the direct employment is low in numbers.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Positive	<ul style="list-style-type: none"> <li>Prioritize recruitment of local workers.</li> <li>Use temporary employment for the training of local people.</li> <li>Prioritize procedures of intensive hand labour instead of machines.</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Long-term	
<i>Magnitude</i>	Moderate	
<i>Significance</i>	High	

#### 7.5 Decommissioning Phase (post-operation)

##### 7.5.1 Waste

##### Production of waste

Waste will be produced during the lifecycle of the project, with greater emphasis during the decommissioning phase, when all the material incorporated in the substations will be converted into waste. It is expected that during decommissioning, all the material that makes up the infrastructure will

be converted into solid waste. Removal of the infrastructure will require the mobilization of workers that will probably have to be hosted in camps, which will produce household waste. Demolition is not known when to occur. For the time being and based in the current condition, these are the possible impacts, however we suggest an EIA is done during the decommissioning phase

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>Minimise the use of disposable materials.</li> <li>Train workers how to minimize and treat wastewater.</li> <li>Dedicate resources to collecting, sorting, depositing, reusing and recycling according to norms</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

### 7.5.2 Traffic and transport

#### Changes in the intensity and traffic due to the transport of the debris to landfills and recycling

The movement of heavy vehicles and equipment will be a factor of “disturbance” in terms of their interference with local traffic, especially as the trucks will driving on the EN12 road for the transportation of the debris to landfills and for recycling purposes.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>Transport extraordinary cargo out of rush hours and if necessary accompanied by traffic police.</li> <li>Ensure the dust prone load is well covered.</li> </ul>
<i>Probability</i>	Definite	
<i>Extension</i>	Local	
<i>Duration</i>	Short-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

### 7.5.3 Health

#### STI's in the population and workers safety and health

In the decommissioning phase, the number of workers will increase when compared to the operation phase. There is again a possibility for exposure to infectious diseases in interaction with employees/local community (STDs including HIV/AIDS); It is likely that workers in the project area are exposed to the risk of other diseases such as malaria, HIV and diarrhoea.



Criterion	Rating	Mitigation measures
<i>Nature</i>	Negative	<ul style="list-style-type: none"> <li>• Education of the public and workers on the risks and health hazards and legal norms, around infection, testing, and sexual behaviours.</li> <li>• Availability of condoms to employees and sales points around the camps.</li> <li>• Access to health services, medicines.</li> <li>• For the workers, ensure provision of mosquito nets, health facilities at camps, maintain a sufficient stock of medicines and prophylactics of first-line treatment of malaria, availability of clean water and adequate sanitary equipment.</li> </ul>
<i>Probability</i>	Highly Probable	
<i>Extension</i>	Local	
<i>Duration</i>	Short term to Long term	
<i>Magnitude</i>	Moderate to High	
<i>Significance</i>	Moderate	

## 7.5.4

**Economy**Direct employment

It is assumed that a workers are required for the decommissioning phase of the project. All the infrastructure that was implemented during the construction phase will have to be dismantled.

Criterion	Rating	Mitigation measures
<i>Nature</i>	Positive	<ul style="list-style-type: none"> <li>• Prioritize recruitment of local workers.</li> </ul>
<i>Probability</i>	Probable	
<i>Extension</i>	Local	
<i>Duration</i>	Short to medium-term	
<i>Magnitude</i>	Low	
<i>Significance</i>	Low	

## 8 ENVIRONMENTAL MANAGEMENT PLAN

### 8.1 The Environmental Management Plan (EMP)

The Environmental Management Plan (EMP) is an instrument, which will allow Electricidade de Moçambique (EDM) to integrate environmental components during the construction, operation and decommissioning of the proposed project. The main objectives of the EMP are the following:

- Provide the Ministry for Environmental Coordination (MICOA) with an instrument that facilitates the objective evaluation of the different project phases, keeping in mind the Mozambican Environmental Legislation, and
- Provide the Proponent of the Project with clear and obligatory instructions with regard to his environmental responsibilities during all project phases.

To ensure the fulfilment of the EMP is the responsibility of the project proponent, in this case of EDM.

The EMP comprises a set of general and specific recommendations, which altogether serve as a basis for the environmental management (mitigation of the impacts). Thus, the EMP serves to identify and describe the principles, responsibilities and activities, which EDM will be obliged to adopt in order to manage environmental aspects and impacts in an efficient way during the different phases of the project.

Normally the specifications in the EMP are designed to reach an optimal environmental protection based on best practices. However, situations can occur where technical difficulties could limit the norms specified in the EMP. In these situations, a pragmatic approach will be needed, which allows some flexibility for determining the best way in order to fulfil with the original intention and objective of the specific measure, in a way to ensure that the necessary intervention will satisfy the objective of the mitigation measure.

The EMP is considered to be an “alive” document that should be sufficiently flexible, using available and “reasonable” techniques without compromise the environmental protection, including socioeconomic aspects. In the cases where the specific conditions cannot be fulfilled and where there is no reasonable technical basis for modifying the stipulated conditions, any amendments to the EMP needed will require the approval of MICOA.

The Basic principles of the Environmental Management Plan are:

- *Principle 1: Environmental Consciousness*

The proponent will be sensitised about the needs of the environment. The construction, operation and decommissioning phases will take into account the environmental aspects and not degrade (or degrade only to a minimum) the existing environmental conditions.

- ***Principle 2: Mitigation***

All the activities related with the life cycle of the Project will include appropriate mitigation measures in a way to guarantee that the negative environmental impacts will be duly mitigated and managed. The mitigation implies the identification of the best options to adopt, the minimisation or elimination of the negative impacts, the enhancement of the benefits related to the proposed project and the protection of public and individual rights. Thus, practical measures are looked for to reduce the adverse impacts or to enhance the beneficial impacts of the project.

- ***Principle 3: Responsibility***

The project proponent assumes complete responsibility for the implementation and control of the actions prescribed for managing the environmental impacts. The efficiency of the environmental mitigation measures needs to be evaluated by the proponent. The proponent and contractor need to manage the environmental impacts during the different project phases, in accordance with the Environmental Management Plan.

## 8.2 **Actors Involved in the Implementation of the Environmental Management and Monitoring Plan**

There are a number of actors who may play a key role in implementing the EMP:

- EDM, as the Project proponent and owner;
- The contractors, the companies that which will carry out construction work;
- Environmental supervisors, which should be hired along with engineering supervisors and be responsible for environmental and occupational safety and health supervision;
- District governments, namely, the Planning and Infrastructure Services (SDPI) and municipal governments;
- National (MICOA) and Provincial Directorates for the Coordination of Environmental Affairs (DPCA) of Nampula;

**Table 10: Environmental Management Plan – Construction Phase**

Phase: Construction					
Activity	Environmental Items	Impact	Objective	Mitigation Measures	Implementation Agency
Description of Activity					
Construction activities (i.e vegetation clearing, topsoil removal) and transportation, including movement of heavy machinery	Geology, geomorphology and soils	Changes in relief of landscape	Grant protection to areas that may be changed in terms of relief	<ul style="list-style-type: none"> <li>• Protection with terraces and vegetation.</li> <li>• Rehabilitation of borrow pits after use.</li> </ul>	Contractor
		Increase of Soil erosion and/or compaction due to construction activities	Reduce soil erosion/compaction	<ul style="list-style-type: none"> <li>• Minimize work in the rainy season.</li> <li>• Limit access to the project area to the necessary minimum and remove as little vegetation as possible.</li> <li>• Avoid creating large open expanses of bare soil as these are most susceptible to wind and run-off erosion. In such areas, if necessary, create windbreaks (e.g. a tree screen).</li> <li>• Suitable drainage systems should be installed to direct water and prevent waterlogging and erosion.</li> <li>• After construction, all non-paved areas should be reinstated with the topsoil to allow the reestablishment of the indigenous herbaceous vegetation.</li> <li>• All bare areas should be re-vegetated as soon as possible.</li> <li>• All vehicles and machinery should only use indicated routes and access roads.</li> </ul>	Contractor

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<p>Construction activities (i.e vegetation clearing, topsoil removal) and transportation and demolition activities</p>	<p>Air Quality</p>	<p>Air Pollution Resulting from Emission of Pollutants from transportation and construction activities</p>	<p>Reduce air pollutants emissions</p>	<ul style="list-style-type: none"> <li>• Good maintenance of engines, vehicles and machinery</li> <li>• Use new, modern machinery and vehicles.</li> <li>• Repair and eventually replace machinery and vehicles when they exceed norms.</li> <li>• Loads on vehicles carrying dusty construction materials should be covered.</li> <li>• Loading and unloading bulk construction should be in areas protected from the wind on in calm conditions.</li> <li>• Vehicles carrying dusty materials should be washed before leaving the site (washing facilities should be available).</li> <li>• Limit access to construction site to construction vehicles only. Impose vehicle speed restrictions on the construction site.</li> <li>• Maintain high moisture content on exposed surface and roads by spraying with water.</li> <li>• Maintenance of construction vehicles to ensure optimum performance with reduced emissions.</li> </ul>	<p>Contractor</p>
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<p>Construction activities (i.e construction of infrastructures)</p>	<p>Hydrology</p>	<p>Changes to runoff</p>	<p>Manage changes of hydrological features</p>	<ul style="list-style-type: none"> <li>• Maintain machinery and vehicles in workshops with sealed floors during all Project phases.</li> <li>• Collect waste oils in designated containers and transport them to the designated disposal/recycling site</li> <li>• Do not dispose untreated wastewater.</li> <li>• Monitor the impact of local erosion due to the flow and, if impact is significant reduce run-off</li> </ul>	<p>Contractor</p>
<p>Construction activities (i.e biomass cut when cleaning the land, packaging, leftovers and defective parts of conductor cable, broken insulators, waste produced by equipment maintenance, solid waste from the worker’s camps, grey and sewage water produced in camps)</p>	<p>Waste</p>	<p>Production of waste</p>	<p>Ensure waste is treated according to the local norms (section 2.4)</p>	<ul style="list-style-type: none"> <li>• Minimise the use of disposable materials.</li> <li>• Train workers how to minimize and treat waste.</li> <li>• Dedicate resources to collecting, sorting, depositing, reusing and recycling according to norms (section 2.4), with special emphasis to metallic waste.</li> <li>• Avoid spillage of waste oil and others</li> </ul>	<p>Contractor</p>
		<p>Generation of waste from demolition of transmission towers</p>	<p>Ensure solid waste is treated according to the local norms (section 2.4)</p>	<ul style="list-style-type: none"> <li>• Minimise the use of disposable materials.</li> <li>• Train workers on how to minimize and treat waste.</li> <li>• Dedicate resources to collecting, sorting, depositing, reusing and recycling, with special emphasis to metallic waste (section 2.4).</li> </ul>	<p>Contractor</p>

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<p>Construction activities (i.e vegetation clearing, topsoil removal) and transportation and demolition of transmission towers</p>	<p>Noise and Vibration</p>	<p>Increase in noise and vibration levels due to transportation and construction activities and demolition of transmission towers</p>	<p>Reduce noise and vibration levels</p>	<ul style="list-style-type: none"> <li>• Transportation of workers, equipment and materials should be undertaken during the day, especially in inhabited areas.</li> <li>• Use modern vehicles and ensure that these are well maintained.</li> <li>• Monitor the level of noise emissions and ensure they are within the applicable limits.</li> <li>• Repair and eventually replace machinery and vehicles when they exceed norms.</li> <li>• The Contractor should take measures to inform the communities about the start of the works and the time limit foreseen for their conclusion, the working hours established by law should be adhered to and respected.</li> <li>• Work continuation during evenings, weekends and holidays should be minimized.</li> <li>• Whenever possible, machines and vehicles should be equipped with silencers.</li> <li>• When possible use noise barriers such as materials resulting from earthworks, trees.</li> <li>• All construction workers must be issued with the necessary protective equipment.</li> <li>• Construction work should be limited to the daytime (08:00-18:00) as far as possible, still a must for activities causing high noise/vibration.</li> </ul>	<p>Contractor</p>
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<p>Construction activities (i.e vegetation clearing)</p>	<p>Fauna and Flora</p>	<p>Loss of flora and fauna due to construction activities</p>	<p>Reduce the loss of fauna and flora</p>	<ul style="list-style-type: none"> <li>• Restrict the access of the Contractor particularly outside of the area where the project will be implemented and reduce the construction work area to a minimum in these areas.</li> <li>• Guarantee the contractor has a license for clearing vegetation.</li> <li>• Limit cutting of trees to the site only.</li> <li>• All vehicles and machinery should only use indicated routes and access roads and therefore no off-road driving.</li> <li>• Apply mechanical vegetation control measures.</li> </ul>	<p>Contractor</p>
<p>Construction activities associated with the demolition of transmission towers or establishment of new infrastructures namely 2 new transmission towers and substation</p>	<p>Landscape and Visual</p>	<p>Change the visual of the landscape due to the building of substation</p>	<p>Reduce the visual impact caused by construction works</p>	<ul style="list-style-type: none"> <li>• Limit construction activities to the construction areas only to minimize visual and landscaping impacts</li> </ul>	<p>Contractor</p>
<p>Construction activities associated with movement of heavy machinery</p>	<p>Traffic and transport</p>	<p>Changes in the intensity and traffic flow due to trucks, extraordinary transport and others</p>	<p>Manage traffic flow</p>	<ul style="list-style-type: none"> <li>• Transport extraordinary cargo out of rush hours and if necessary accompanied by traffic police.</li> <li>• Place signs and safety barriers.</li> <li>• Educate workers to follow traffic rules.</li> <li>• Reduce roadblocks to a minimum.</li> <li>• Ensure the load prone to dust is well covered.</li> </ul>	<p>Contractor</p>

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<p>Construction activities (i.e new employment opportunities for local and people from other areas; accidents associated with construction phase such as working at heights)</p>	<p>Health</p>	<p>STI's in the population and workers safety and health</p>	<p>Reduce health impacts associated with migration of people to project site</p>	<ul style="list-style-type: none"> <li>• Education of the public and workers on the risks and health hazards and legal norms, around infection, testing, and sexual behaviours.</li> <li>• Availability of condoms to employees and sales points around the camps.</li> <li>• Access to health services, medicines.</li> <li>• For the workers, ensure provision of mosquito nets, health facilities at camps, maintain a sufficient stock of medicines and prophylactics of first-line treatment of malaria, availability of clean water and adequate sanitary equipment.</li> </ul>	<p>Contractor</p>
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		Work accidents	Reduce work accidents and risk of injury	<ul style="list-style-type: none"> <li>• Train workers in occupational safety and health. All contractor teams involved in works during the construction phase shall be briefed on their obligations towards health &amp; safety controls and methodologies. The briefing must take the form of a presentation and demonstration. The education / awareness programme should be aimed at all levels of management and general staff within the Contractor teams. An attendance register shall be signed at this briefing. Local labourers hired for the construction phase must receive training related to health &amp; safety awareness prior to commencement of the works.</li> <li>• Periodical exercises and simulations.</li> <li>• Award good behaviour.</li> <li>• Train employees in first aid.</li> <li>• Reserve a vehicle for emergencies such as transportation of patients at work site.</li> </ul>	Contractor
Construction activities (i.e employment opportunities, migration of workers to areas near the site)	Economy	Loss of crops, crop areas and other economic opportunities	Minimize and compensate economic losses for local communities	<ul style="list-style-type: none"> <li>• Advise farmers before construction so that they can harvest their crops.</li> <li>• Compensate for the value, land and opportunities lost in a compensation plan. To this extent a Simplified Land-Use Compensation Plan (SLUCP) has been prepared and is presented as separate document to this SES.</li> </ul>	EDM

		<p>Direct employment</p>	<p>Increment employment opportunities for local workers</p>	<ul style="list-style-type: none"> <li>• Prioritize recruitment of local workers.</li> <li>• Use temporary employment for the training of local people.</li> <li>• Prioritize procedures of intensive hand labour instead of machinery</li> </ul>	<p>EDM and Contractor</p>
		<p>Indirect employment due to induced development</p>	<p>Ensure linkages and benefits from implementation of project are also translated to local and national suppliers</p>	<ul style="list-style-type: none"> <li>• Prioritize local and national suppliers.</li> <li>• Invest in training of local service providers.</li> <li>• Connect the Project to investments.</li> <li>• Encourage investments that allow the recruitment of more local hand labour.</li> </ul>	<p>EDM and Contractor</p>

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Construction activities (i.e employment opportunities, migration of workers to areas near the site)	Tensions	High expectations with regards to employment opportunities	Manage work expectations	<ul style="list-style-type: none"> <li>• If local workers (non-specialized and/or semi-specialized) will be necessary, the project must as far as possible incorporate and maximize the use of local labour. This should be best coordinated with the local authorities and with the provincial Directorate of Labour.</li> <li>• In the Contractor’s contract, the number of work places to be opened for local staff should be stipulated, the hiring requirements, the maximum duration of the work, the recruitment procedures and wage levels.</li> </ul>	EDM and Contractor
		Social conflict due to physical presence of external workers	Avoid conflicts	<ul style="list-style-type: none"> <li>• Both, workers and local communities, should be subject to awareness-raising campaigns, so as to promote good relations, thus avoiding the occurrence of conflicts.</li> </ul>	EDM and Contractor

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Table 11: Environmental Management Plan – Operation Phase

Phase: Operation stage					
Activity	Environmental Items	Impact	Objective	Mitigation Measures	Implementation Agency
Description of Activity					
Operation activities (ie replacement of broken parts, maintenance of substation and domestic waste from workers)	Waste	Production of waste	Ensure waste is treated according to the local norms (section 2.4)	<ul style="list-style-type: none"> <li>Minimise the use of disposable materials.</li> <li>Train workers how to minimize and treat waste.</li> <li>Dedicate resources to collecting, sorting, depositing, reusing and recycling according to norms.</li> <li>Avoid spillage of waste oil and others</li> </ul>	EDM – North Region
Operation activities	Air quality	Air Pollution Resulting from Emission of Pollutants from operation	Reduce air pollutants emissions	<ul style="list-style-type: none"> <li>Good maintenance of engines, machinery and vehicles</li> <li>Use new, modern machinery and vehicles</li> <li>Repair and eventually replace machinery and vehicles when they exceed norms.</li> </ul>	EDM – North Region
Operation activities (ie machinery and equipment operation)	Noise and Vibration	Increase in noise levels due to substation operation	Reduce noise and vibration levels	<ul style="list-style-type: none"> <li>A barrier of mature trees or high soil berms (green area) between the substation and nearby residences can be helpful in reducing noise impacts.</li> </ul>	EDM – North Region
Operation activities (i.e operation of the substation)	Energy Supply	Improved energy supply	Guarantee long term power supply	<ul style="list-style-type: none"> <li>Ensure integration of the project in the investment strategies in the four provinces affected by the Chimuará-Nacala Transmission Project.</li> </ul>	EDM – North Region

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Operation activities (i.e employment on the substation during operation phase)	Economy	Direct employment	Increment employment opportunities for local workers	<ul style="list-style-type: none"> <li>• Prioritize recruitment of local workers.</li> <li>• Use temporary employment for the training of local people.</li> <li>• Prioritize procedures of intensive hand labour instead of machines</li> </ul>	EDM – North Region
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**Table 12: Environmental Management Plan – Decommissioning Phase**

Phase: Decommissioning stage (post-operation)					
Activity	Environmental Items	Impact	Objective	Mitigation Measures	Implementation Agency
Description of Activity					
Decommissioning activities (i.e dismantlement of the substation and domestic waste from workers on site)	Waste	Production of waste	Ensure waste is treated according to the local norms	<ul style="list-style-type: none"> <li>• Minimise the use of disposable materials. Train workers how to minimize and treat wastewater.</li> <li>• Dedicate resources to collecting, sorting, depositing, reusing and recycling according to norms.</li> </ul>	EDM
Decommissioning activities associated with movement of heavy machinery	Traffic and transport	Changes in the intensity and traffic due to the transport of the debris to landfills and recycling	Manage traffic flow	<ul style="list-style-type: none"> <li>• Transport extraordinary cargo out of rush hours and if necessary accompanied by traffic police.</li> <li>• Ensure the dust prone load is well covered.</li> </ul>	EDM

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Decommissioning activities associated with migration of workers involved in dismantling of substation infrastructure	Health	STI's in the population and workers safety and health	Reduce health impacts on local communities and workers	<ul style="list-style-type: none"> <li>• Education of the public and workers on the risks and health hazards and legal norms, around infection, testing, and sexual behaviours.</li> <li>• Availability of condoms to employees and sales points around the camps.</li> <li>• Access to health services, medicines.</li> <li>• For the workers, ensure provision of mosquito nets, health facilities at camps, maintain a sufficient stock of medicines and prophylactics of first-line treatment of malaria, availability of clean water and adequate sanitary equipment.</li> </ul>	EDM
Decommissioning activities associated with migration of workers involved in dismantling of substation infrastructure	Economy	Direct employment	Increment employment opportunities for local workers	<ul style="list-style-type: none"> <li>• Prioritize recruitment local workers.</li> </ul>	EDM

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## THE ENVIRONMENTAL MONITORING PLAN (EMoP)

In fulfilment of the Environmental Impact Assessment, on a tentative basis, **Impacto Lda.** proposes the following monitoring programme to determine the degree of implementation and effectiveness of the mitigation measures applied to the project activities.

Environmental monitoring can be defined as the systematic sampling of air, water, soil and biota in order to observe and study the environment, as well as to derive knowledge from this process (Wiersma, 2004). For the current project, an environmental monitoring programme will be defined for a number of elements such as ambient air quality (dust/SPM) and noise/vibration during construction/installation stage of the project that is considered as adequate. No surface water quality monitoring is regarded as necessary since there are no surface water bodies like rivers located in the vicinity of the project site.

### 9.1.1 Ambient Air Quality

The monitoring of air quality is important in order to ensure that National Ambient Air Quality Standards as well as international standards (ie World Bank) are not exceeded. The legal framework for the air quality includes:

- Decree No. 18/2004 approving the Regulation on Environmental Quality and Effluents' Emissions,
- Decree No. 67/2010 as a supplement of the Regulation on Environmental Quality and Effluents' Emissions (Decree No. 18/2004)
- World Bank Guideline

Ambient air quality sampling for the construction stage of the project (Namialo SS including temporary access road) focused on SPM /dust monitoring of ambient environment.

Dust (represented by SPM<sub>10</sub> and SPM<sub>2.5</sub>) is the significant air pollutant consequent to site clearance and other related construction activities. Operation of substation would have no effect on ambient air quality and hence operational stage ambient air quality monitoring is not required.

Ambient air quality conditions are considered to be good due to the rural nature of the study area and the lack of any industrial development in the general Project area. Air emissions are limited to small points sources related to subsistence agriculture and informal economic activities. Parameters such as NO<sub>2</sub>, SO<sub>x</sub> and CO are not required due to the fact that the project area is a wide-open area and these are likely to be fairly minimal.



### 9.1.2 Noise and Vibration

Necessary for construction stage of the project (SS and temporary access road). Operational stage noise/vibration could be mitigated with the provision of green space around the SS and other structural measures of sound proofing, if necessary. As such operational stage noise/vibration monitoring is regarded as not necessary. Mozambique has not promulgated its own noise regulations and reference is usually made to other standards and guidelines in cases where noise impacts need to be assessed. For this reason, the Pollution Prevention and Abatement Handbook from The World Bank Group was used.

### 9.1.3 Waste

Typical for a construction site and would require proper management of solid waste (including demolition waste in particular existing transmission tower demolition waste), sanitary waste, house-keeping of construction site and worker camp/housing areas during construction stage of the project by the construction contractor. Proper sanitary and solid waste management will continue during operation stage of the project as well focused on the office and other related living related areas like kitchen, and water closet (toilet) facilities of the SS (substation) by EDM.

## 9.2 Operation Phase

There is no need to monitor air quality, noise and vibration. Only for solid waste and sanitary waste. Section 2.4 of the current document highlights the waste management legal framework.

The entire environmental monitoring plan proposed for both the construction and operation phases of the project are summarized in Table 13.

Table 13: Environmental Monitoring Plan for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Environmental Items	Environmental Parameters/ Monitoring Item	Unit	Mozambique Standards: Decree 18/2004 and supplement 67/2010	Referred International Standards - WB/IFC Guidelines	Remarks (Measurement Point, Frequency, Method)	Responsible Agency	Cost of Monitoring
<b>Construction Phase</b>							
Air Quality	SPM <sub>10</sub>	µgm/ m <sup>3</sup>	Not Specified	50 150 Interim Value	·One Sampling Point near the project site and one sampling point 1 km away from the project site ·At least once in three months (one every season) - one 24 hr. day sampling ·High Volume Dust Sampler may be used	Implementation - Contractor / EDM	5000 USD per set Included in the overall construction cost
	SPM <sub>2.5</sub>	µgm/ m <sup>3</sup>	Not Specified	35 75 Interim Value	·One Sampling Point near the project site and one sampling point 1 km away from the project site ·At least once in three months (one every season) - one 24 hr. day sampling ·High Volume Dust Sampler may be used	Implementation - Contractor / EDM	5000 USD per set Included in the overall construction cost
Noise and vibration	Noise and vibration level	dB	Not Specified	70 (Night-time) 70 (Day-time) (Industrial Area)	100m from the construction site Per Month one 24-hr. day sampling Sound level meter	Implementation - Contractor / EDM	5350 USD per set Included in the overall construction cost
Waste	Solid waste (including demolition waste) Sanitary waste Housekeeping waste	-	-	-	Worksite and camp site (weekly)	Implementation - Contractor / EDM	Included in the overall construction cost
<b>Operation Phase</b>							
Waste	Solid waste and sanitary waste Housekeeping waste of the substation	-	-	-	Substation Worksite (weekly)	Implementation - EDM (North Region)	Included in the overall operation cost

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### 9.3 **Independent Audit**

EDM will be in charge of auditing the contractor. It is the task of MICOA and/or DPCA-Nampula to hold independent audits to verify compliance with the mitigation measures stated in this report.

The SES proposes that independent audits/supervision are undertaken to verify compliance with the mitigation measures stated in the report. EDM may hire an external auditor or a supervising consultant to ensure independence and impartiality in order to ensure that the Project is complying with the EMP requirements.

### 9.4 **Monitoring Form**

In light of the environmental monitoring plan for air quality, noise and waste, Table 14 presents the monitoring form for the three components.

Table 14: Environmental Monitoring Form for the Project for Reinforcement of Transmission Network in Nacala Corridor in Republic of Mozambique

Environmental Parameter	Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Mozambique Standards: Decree 18/2004 and supplement 67/2010	Referred International Standards - WB/IFC Guidelines	Remarks (Measurement Point, Frequency, Method)
<b>Construction Phase</b>							
<b>Air Quality</b>	SPM <sub>10</sub>	µgm/m <sup>3</sup>			Not Specified	50 150 Interim Value	One Sampling Point near the project site and one sampling point 1 km away from the project site · At least once in three months (one every season) – 24 hr. day sampling · High Volume Dust Sampler may be used
	SPM <sub>2.5</sub>	µgm/m <sup>3</sup>			Not Specified	35 75 Interim Value	One Sampling Point near the project site and one sampling point 1 km away from the project site · At least once in three months (one every season) – 24 hr. day sampling · High Volume Dust Sampler may be used
<b>Noise and vibration</b>	Noise and vibration level	dB			Not Specified	70 (Day-time) 70 (Night-time)	· 100m from the construction site · Per Month one 24-hr. day sampling · Sound level meter
<b>Waste</b>	Solid waste (including demolition waste) Sanitary waste Housekeeping waste						Worksite and camp site (weekly)
<b>Operation Phase</b>							
<b>Waste</b>	Solid waste and sanitary waste Housekeeping waste of the substation						Substation Worksite (weekly)

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**BENEFICIAL EFFECTS OF THE PROJECT**Employment Opportunities

With the construction of the Namialo Substation, there will be employment opportunities especially for casual workers from the local community. Creation of employment opportunities has both economic and social benefit. In the economic benefit, abundant unskilled labour will be used in economic production while socially the young and energetic otherwise poor people will be engaged in productive employment other than remaining idle. Employees with diverse skills are expected to work on the site during the construction period. Unskilled employees will gain some skills.

Employment opportunities are one of the long-term major positive impacts of the proposed Substation at the site location. This will occur during the operation and maintenance of the Substation. Other sources of employment will involve direct technical service provision to the Substation e.g. electrical engineers, Technicians, substation operators among others. There could be other indirect sources of employment e.g. businesses that rely on electricity.

For demolition to take place properly and in good time, several people will be involved. As a result several employment opportunities will be created for the demolition staff during the demolition phase of the proposed

Gains in the Local and National Economy

There will be gains in the local and national economy as a result of the construction of the proposed substation, through consumption of locally available materials including: timber, metals and cement. The consumption of these materials and others will attract taxes including Value Added Tax (VAT) and Income Tax which will be payable to the government. The cost of the materials will be payable directly to the suppliers.

Provision of Market for Supply of Building Materials

The project will require supply of large quantities of building materials most of which will be sourced locally from the surrounding areas. This provides ready market for building material suppliers such as quarrying companies, hardware shops and individuals with such materials.

Informal Sectors Benefits

During construction phase of substation, the informal sectors are temporarily likely to benefit from the operations. This will involve kiosk operators who

will be selling food to the workers on site. This will finally promote informal sector entrepreneurs at the surrounding areas for the period that the construction will be taking place.

#### Increase in electricity supply

In Mozambique, the electricity demand by far outstrips the electricity supply. The substation was requested for establishment to take care of the growing load in the area it is located. It will relieve the existing overloaded and long feeders and hence reduce technical losses in the system.

#### Increase in Revenue

There will be positive gain for the revenue system to the Government arising from the increased consumption of the electrical power from the proposed Substation. The electricity customers will be paying taxes to the Government.

#### Improved Security

With the establishment of the proposed Substation at the proposed site, the level of security will be improved around the project areas. This is as a result of more security lights and security personnel being employed to guard the Substation. The project site will also be well fenced. Hence if the level of security is increased, the neighbourhood will be more secure than before.

## INSTITUTIONAL CAPACITY REQUIREMENTS

Given the geographical and economic scope of the Project, the general institutional framework for its effective implementation includes a wide range of agents and institutions. A brief initial panorama of the relevant institutions, their potential roles in the Project and their influence on its potential results is presented below.

The main agents and institutions involved in the Project are:

- Electricidade de Moçambique (EDM), as the proponent of the Project;
- The Ministry of Energy as the supervisory authority;
- The Ministry for the Coordination of Environmental Action (MICOA), responsible for environmental licensing and territorial planning;
- The Ministry of Agriculture (MINAG), responsible for issuing land use and benefits rights and logging licences and concessions;
- The provincial government of Nampula, in particular the Provincial Directorates for Mineral Resources and Energy (*Direcções Provinciais de Recursos Minerais e Energia - DPRME*), for the Coordination of Environmental Action (*Coordenação da Acção Ambiental -DPCA*), Agriculture (DPA), and Labor (DPT), as the bodies responsible for integrating the Project into economic and social development plans and strategies and licensing processes, namely, for investments that will involve granting spaces for mineral, agricultural and forest purposes that could interfere with the Project;
- The government of the Meconta district and its administrative posts where will be works on the new substation;
- The population in the direct area of influence;

## CONCLUSION AND RECOMMENDATIONS

For the purpose of evaluating the environmental and socioeconomic impacts, three main phases of the proposed project were considered in this study: construction, operation and decommissioning.

In the light of the proposed project, a number of potential environmental and socioeconomic impacts (negative and positive) were identified and assessed. The large majority of the biophysical impacts were considered low in terms of significance.

The biophysical parameters assessed include geology, geomorphology and soils, air quality, hydrology, solid waste, noise, flora and fauna, landscape and visual and land use. The socioeconomic impacts were both positive and negative during the three phases of the proposed project. The positive socioeconomic impacts were particularly focused on the economy (i.e. direct and indirect employment) and public utilities (i.e. increase in the amount of energy available). The negative socioeconomic impacts were mostly associated with health (i.e. STI's in the population and workers safety, work accidents), economy (i.e. loss of crops, crop areas and other economic opportunities), tensions (i.e. high expectations with regards to employment opportunities and social conflict due to physical presence of external workers) and traffic and transport (i.e. changes in the intensity and traffic due to the transport of the debris to landfills and recycling).

Considering that Namialo site is regarded as optimal with respect to social aspects (i.e. no local communities present and in need of physical resettlement) and environmental aspects (i.e. vegetation has been mostly transformed into agriculture fields), the impacts assessed in the three phases (construction, operation and decommissioning) are generally low. An environmental management plan was drafted in order to:

- Ensure that the proponent, EDM, would be in charge, through the establishment of a RU, of implementation, mitigation and monitoring of the activities presented in the SLUCP.
- Provide the Ministry for Environmental Coordination (MICOA) with an instrument that facilitates the objective evaluation of the different project phases, keeping in mind the Mozambican Environmental Legislation, and
- Provide the Proponent of the Project with clear and obligatory instructions with regard to his environmental responsibilities during all project phases.



A general perspective on the establishment of the new substation in the Namialo site suggests that the project will provide employment opportunities, gains in the local and national economy, provision of market for supply and building material, informal sector benefits, increase in electricity supply, increase in revenue and increase in security.

Under the light of the above and since no fatal flaws have been identified, we propose that the establishment of the substation in the Namialo area should proceed. From the assessment point of view, it is considered that the project could be implemented without causing any major detrimental effects on the physical, biological and socio-economic environment provided that the mitigation, environmental management and environmental monitoring measures are fully implemented and will allow for minimizing potential negative impacts and to enhance potential positive impacts of the project, so as to ensure that it can be implemented in an environmentally and socially sound manner.

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## 14 ANNEX

## 14.1 Annex 1 - Letter from DPCA



REPUBLICA DE MOÇAMBIQUE

MINISTÉRIO PARA A COORDENAÇÃO DA ACÇÃO AMBIENTAL  
 DIRECÇÃO NACIONAL DE AVALIAÇÃO DO IMPACTO AMBIENTAL  
 DNAIA

À:  
 EDM

Maputo

Nossa referência N<sup>o</sup> 26 /MICOA/DNAIA/180/14

Data: 12-06-2014

**Assunto: Projecto de Transporte de Energia Chimuara – Nacala / Alteração do local da Subestação 400/220/110 Kv de Namialo**

Exmos Senhores,

A DNAIA recebeu de V.Excias o pedido de alteração do local inicialmente proposto para a construção da Subestação de Namialo para um novo local, por forma a capitalizar as infra-estruturas existentes e respectiva minimização de impactos sobre o meio ambiente. Da análise dos antecedentes do projecto e da visita ao novo local, efectuada pela Direcção Provincial para a Coordenação da Acção Ambiental de Nampula, somos de parecer favorável à alteração do local tendo em conta que os impactos ambientais identificados são abrangentes, e não existem pessoas e benfeitorias a serem afectadas.

Com os melhores cumprimentos,



C.C: DPCA-Nampula

## **PART 3**

### **PUBLIC ENGAGEMENT**

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## 1 INTRODUCTION

Electricidade de Moçambique E.P. (EDM), the national electricity company is the proponent for the reinforcement of the electricity transmission network of the Nacala Corridor in Nampula province. EDM is responsible for developing and implementing the Project on behalf of the Government of Mozambique.

IMPACTO Ltd, was contracted by the Proponent to conduct a Simplified Environmental Study (SES) and a Simplified Land Use Compensation Plan (SLUCP) in order to produce environmental and social information for Meconta District, Nampula province, where the new electricity sub-station will be located.

Given the importance of the project for the local development and in order to maintain the authorities and the Interested and Affected Parties (IAPs) informed about the project's development, a Public Engagement meeting was held in Meconta district.

The present document constitutes the report on the public engagement meeting that was held and is an integral part of the Simplified Environmental Study report.

## 2 OBJECTIVES OF THE PUBLIC ENGAGEMENT

The objective of the public engagement was to enquire the sensitivity of the key Interested and Affected Parties regarding the project activities that are to be developed and disseminate the results of the Simplified Environmental Study. During the Public engagement, the IAPs had the opportunity to raise concerns, opinions and comments on any relevant aspect, so that this can be included into the existing environmental study, as well as to provide clarifications on aspects related to the project. The information process also allowed to create a communication channel between the public, the consultants and the project proponent to be developed during the period of project implementation.

The meeting held in Meconta district was guided by the following specific objectives:

- Provide information on the project;
- Disseminate the results of the studies carried out; and
- Enquire the sensitivities of the stakeholders that potentially will be related to the project and provide clarifications on aspects linked to the project, aiming at the inclusion of these key aspects into the Simplified Environmental Study report.

### 3 METHODOLOGY ADOPTED FOR THE PUBLIC ENGAGEMENT

Given the dimension of the project and the type of studies carried out, only one public engagement meeting was organised in the district capital of Meconta. The objective of the public engagement was to ensure that the local authorities and PAP were informed about the development of the project in the Meconta District, the impacts associated with the implementation of the project and the mitigation measures to be put in place in order to minimize the impacts that were identified through the studies. The Public engagement was conducted in a simply way with the aim of gathering the concerns of the interested and affected parties of the project.

#### 3.1 Identification Of The Key Interested And Affected Parties

As this meeting was meant to be a directed public engagement with the local communities, all those persons that will be directly or indirectly affected and those only interested in the project were identified at level of Meconta district, particularly in Namialo administrative post. Thus, the following IAPs were identified:

- directors of district services
- influential persons at level of the district capital;
- the head of Namialo administrative post and 2 administrative post staff; and
- other entities to be selected by the district administrator

#### 3.2 Involvement Of The Key Interested And Affected Parties

Being a public engagement meeting, the invitation at district level was done by means of an invitation letter addressed to the Administrator of Meconta district, who was requested in the letter to invite the members of the local Consultative Council in the district capital, representatives of Namialo administrative post, representatives from civil society and influential people to participate in the meeting.



**SUMMARY OF MEETING HELD**

The public engagement meeting of the project was held on 22<sup>nd</sup> August 2014 in the meeting room of Meconta District Administration from 10.00 to 1200 hours and was guided by the agenda scheduled for the meeting (Annex B).

In the meeting were present the district administrator and the members of the Consultative Council resident in the district capital and in Namialo Administrative Post (Annex C). The meeting was held with 39 participants.

The meeting was officially opened by the District Administrator, Rosa Vianeque, who thanks the consultant for their presence in the district and for the opportunity created for engaging the district into the public engagement process.

After that, the facilitator of the meeting and consultant of Impacto Lda., Eng. Herberto Nhampanze, welcomed the participants and presented the meeting's agenda and objectives and the project proponent, followed by the presentation of the EIA process in Mozambique.

After the introductory part, the facilitator of the meeting continued with the presentation of the results from the project's Simplified Environmental Study, focusing on the context, the project area and the potential impacts on the biophysical and socioeconomic components in the project's area of influence.

At the end of the presentation, the facilitator declared the questions and answers session as opened, in which seven interventions were made by the participants. All the questions raised by the participants during the meeting and the answers provided by the consultant and proponent were recorded in a Questions and Answers Matrix (Appendix D). At the end of the debate session, the district administrator was once more invited to make the final considerations and to officially close the public engagement meeting.



Opening ceremony by the Administrator



Participants listening to the presentation



Participant intervening during the meeting



Representative of EDM responding to a question



Closing ceremony by Administrator

**Figure 1: Photographic record of the public engagement in Meconta**

## 4.1 Summary of Issues Raised

The main issues raised during the meeting include the following:

- ↗ **Project location:** the participants enquired about the exact location of the project area and about the specific location where the sub-station will be implanted. This question allowed the local authorities to start awareness raising regarding development projects in the communities. Participants were informed that the sub-station will be constructed in Micolene village. Participants were also informed that the final design of the substation would be presented to them at a later stage.
- ↗ **Starting date of the project:** the participants have requested information about the start date of the project. EDM explained that the date for the start of the project has not yet been defined.
- ↗ **Involvement of district authorities:** Suggestions were made in the sense that whenever EDM intends to carry out any activities regarding the implantation of the project, EDM should involve the district authorities.
- ↗ **Hiring of labour:** concerns were raised regarding the hiring of labour and participants were informed that the hiring of local labour would be prioritised during the three phases of the project development.

## 5 CONCLUSIONS

In general, it can be concluded that the objectives of the public engagement have been achieved. The attendance of the meeting was considered very good as the number of attendees surpassed the number of people invited to the meeting. The public engagement meeting have allowed to gather questions, suggestions and comments from the PAP as well as for clarification of doubts and input to the SES report.

## **Annex A – Invitation letter**



**Ref. Impacto.C.213/14**

Maputo, 13rd August, 2014

Mrs. Administrator of the District Meconta  
Dra. Rosa Vianeque

**Nampula**

**Assunto: Information Meeting about Reinforcement of Transmission Network of Nacala Corridor Project, Nampula Province**

Dear Madam,

---

The Electricity of Mozambique EP (EDM), on behalf of the Government of Mozambique is developing a project to reinforce the transmission of the Nacala corridor network in Nampula Province.

This project is part of a large project called Project of Transport Energy Chimuará-Nacala, which was approved by the Ministry for Coordination of Environmental Affairs (MICOA), which involves the construction of a transmission line between power between Chimuará Namialo 400 kV and Namialo of the Nacala-a-Velha 220 kV, Nacala-a-Velha Nacala Port 110 kV and Namialo to Nampula 220 kV and that will also include the construction of new substations and the expansion existing substations. The project aims to increase the capacity of supply of power to the provinces of Zambezia and Nampula to facilitate the starting of large investment projects, mainly in Monapo and Special Economic Zone (EEZ) of Nacala.

The project involves only the above-mentioned construction of a new substation in Namialo and even an access road connecting the new substation to the main road.

At this point, the burden of electricity from a single airline power transmission from adjacent substations is very high and it is possible that in the near future, this will become overloaded. Therefore, in accordance with the above, this project will be of paramount importance to reinforce the power transmission network in the Nacala corridor.

The EDM, designated IMPACTO, Lda. as independent Consultant to conduct a Simplified Environmental and Social Study in order to produce more specific information for the area where the new substation will be located. The project was submitted to MICOA, which was approved without the need to perform an environmental study.

Given the importance of the project for local development and in order to keep authorities and Interested and Affected parties informed about the project, will be held an Information Meeting at Meconta District, Nampula Province level.

In this context, the IMPACTO Lda requests a meeting with Your Excellency and further requests that are invited to the same meeting the members of the Advisory Council of the District of Meconta, residents at the headquarters for the day August 22, 2014, in Conference Room District Administration Meconta from 10:00 to 12:00 hours

We also request the presence of the following entities:

- District Directors;
- Influential at headquarters of the district;
- Chief Administrative Post Namialo + 2 representatives
- Other entities

Preceding the meeting to be held at the headquarters of the District of Meconta, IMPACTO is requesting a brief meeting with the District Administrator, at the Administration Building on 22 August at 09:30 hours, for the purpose of harmonization on activities that should take place during a meeting.

In advance thank you the valuable collaboration so that we can fulfill the above program.

For any question you can contact IMPACTO through the following addresses: [kete.fumo@impacto.co.mz](mailto:kete.fumo@impacto.co.mz); [consulta.publica@impacto.co.mz](mailto:consulta.publica@impacto.co.mz) or phone: +258 21499636, Fax: +258 21493019 or Mobile: +258 82 6656570.

Yours sincerely

Jorge Lacerda  
Executive Director

## **Annex B –Agenda of the Meeting**

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR  
REINFORCEMENT OF THE TRANSMISSION NETWORK IN NACALA  
CORRIDOR PROJECT**

**AGENDA of the Information Meeting**

**MECONTA DISTRICT – Meeting Room of the Meconta District Government  
22nd August, 2014, 10:00 - 12:00 hours**

<b>Time</b>	<b>Presentation</b>	<b>By</b>
<b>Arrival</b>	Participant registration	<b>Participants</b>
<b>10:00</b>	Welcome and introduction of participants	<b>District Administrator</b>
<b>10:10</b>	Presentation of the working team	<b>Facilitator</b>
	◆ Introduction and Objectives of the Meeting Information	<b>Facilitator</b>
<b>10:20</b>	◆ Presentation of the Project	<b>EDM</b>
<b>10:30</b>	◆ Presentation of the Draft Simplified Environmental Study Report	<b>IMPACTO</b>
<b>10:50</b>	<b>Coffee Break</b>	
<b>11:05</b>	Debate	
<b>12:00</b>	Final considerations	<b>IMPACTO</b>
<b>12:05</b>	<b>Closure</b>	<b>District Administrator</b>



## **Annex C – Participant Attendance List**

## PROJECTO DE REFORÇO DA REDE DE TRANSMISSÃO DO CORREDOR DE NACALA – PROVÍNCIA DE NAMPULA

## REGISTO DOS PARTICIPANTES

DISTRITO DE MECONTA, Governo Distrital, 22 de Agosto de 2014, 10:00 – 12:00 horas

NOME	INSTITUIÇÃO / COMUNIDADE	POSIÇÃO / RESPONSABILIDADE	CONTACTO
1. CALITHA CHAMELIA	RAINHA - NACALA	7 DE ABRIL	
2. CHALE ASSANE	DEGULO - NACALA	"	
3. JOSÉ E. UDAO	DEG. - ME PANIA	"	
4. ANILDO SALVADO	SECR. C. ANPITA	NAMPULO	
5. ESTEVAO C. MURAYANE	1º SECR. FRIANES	"	
6. JOSÉ JOSÉ ALMEIDA	SECR. C. CP	MECONTA - PEJE	

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**PROJECTO DE REFORÇO DA REDE DE TRANSMISSÃO DO CORREDOR DE NACALA – PROVÍNCIA DE NAMPULA**

**REGISTO DOS PARTICIPANTES**

DISTRITO DE MEGONTA, Governo Distrital, 22 de Agosto de 2014, 10:00 – 12:00 horas

	NOME	INSTITUIÇÃO / COMUNIDADE	POSIÇÃO / RESPONSABILIDADE	CONTACTO
7	FAPANE JOAO	LIDER - B. MORABO MOUTO	MELUNGA - JEJE	
8	ACACIO AGUIPO	LIDER - B. NACOPÓ	MELUNGA - JEJE	
9	MARIA DE FREITAS & ANDRE	LIDER - S. NANYICHALALA	—	
10	CESAR JOAO	LIDER - B. NAPÓLO - JEJE	—	
11	GUICHERMINA VALLIA	LIDER - B. NYME - ESTACÓ	—	
12	AMILIA JOAO CEBOLA	LIDER - B. DAINATA	—	

A13-115

## PROJECTO DE REFORÇO DA REDE DE TRANSMISSÃO DO CORREDOR DE NACALA – PROVÍNCIA DE NAMPULA

## REGISTO DOS PARTICIPANTES

DISTRITO DE MECONTA, Governo Distrital, 22 de Agosto de 2014, 10:00 – 12:00 horas

	NOME	INSTITUIÇÃO / COMUNIDADE	POSIÇÃO / RESPONSABILIDADE	CONTACTO
13	ALVARO PAZISIA MACHA	UNER. B. UNISPOXHANE	—	
14	ANA M. ARMANHO	SEEDS. C. MATHARIMA	MECONTA	
15	ANTONIO CHARIA	REG. POUTHEHA	MECONTA	
16	ALONSO DOWELA	CAB. NANCORO	MECONTA	
17	ANGELINA ANGELO	LIDER - NANCHIRO		
18	JANUARIO FRANCO	LIDER - RAIANE		

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**PROJECTO DE REFORÇO DA REDE DE TRANSMISSÃO DO CORREDOR DE NACALA – PROVÍNCIA DE NAMPULA**

**REGISTO DOS PARTICIPANTES**

DISTRITO DE MECONTA, Governo Distrital, 22 de Agosto de 2014, 10:00 – 12:00 horas

	NOME	INSTITUIÇÃO / COMUNIDADE	POSIÇÃO / RESPONSABILIDADE	CONTACTO
19	JANIEL ARMANAN	CEDER - CARONE	NEGÓCIOS - SE	
20	CECÍLIA MANUEL	SDPE - NATUANO		
21	DAVID A. CARREIRO	MEMBRO DO CCP. NATUANO	NATUANO	
22	FRANCISCO DA GUILHERME	MEMBRO DO CCP. MECONDA	MECONDA - SE	
23	JERIMIAS ALFAI	1º S. COM. FES - CARONE	NAMPULA	
24	JUMA CUREPE	1º S. C. NATUANO	11	

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**PROJECTO DE REFORÇO DA REDE DE TRANSMISSÃO DO CORREDOR DE NACALA – PROVÍNCIA DE NAMPULA**  
**REGISTO DOS PARTICIPANTES**  
 DISTRITO DE MECONTA, Governo Distrital, 22 de Agosto de 2014, 10:00 – 12:00 horas

NOME	INSTITUIÇÃO / COMUNIDADE	POSIÇÃO / RESPONSABILIDADE	CONTACTO
25 ALI RAQVIA	POST. ADM/MECANTA		
26 TOMAN ERNESTO	1º S.C. MECANTA	NAMPULO	
27 LUCAS A. VICTOR	1º S. JOAQUIM CH.	NAMPULO	
28 CESAR R. MANUEL	1º S. D. S. BESENDA	NAMPULO	
29 ANANIAS NUNDELA	LIDER DE MATEDELO	NAMPULO	
30 ANTONIO XAVIER	1º S. C. FONA	NAMPULO	

A13-118

## PROJECTO DE REFORÇO DA REDE DE TRANSMISSÃO DO CORREDOR DE NACALA – PROVÍNCIA DE NAMPULA

## REGISTO DOS PARTICIPANTES

DISTRITO DE MECONTA, Governo Distrital, 22 de Agosto de 2014, 10:00 – 12:00 horas

	NOME	INSTITUIÇÃO / COMUNIDADE	POSIÇÃO / RESPONSABILIDADE	CONTACTO
31	JÓSE FORONCA	Reg. Nampula	Nampula-Venda	
32	Afonso Chamusca	Reg. Nampula	Nampula	
33	NZANOEL SARIVA	Reg. Nampula	Nampula-Venda	
34	OSCAR JÓRGÉ	2.º Sec. Eduardo Mendonça	Nampula	
35	TOMÁS AMORIM	1.º Sec. C. Vieira	"/	
36	JAIPE MAFEUS	1.º Sec. Assist. Vieira	"/	

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**PROJECTO DE REFORÇO DA REDE DE TRANSMISSÃO DO CORREDOR DE NACALA – PROVÍNCIA DE NAMPULA**

**REGISTO DOS PARTICIPANTES**

DISTRITO DE MECONTA, Governo Distrital, 22 de Agosto de 2014, 10:00 – 12:00 horas

	NOME	INSTITUIÇÃO / COMUNIDADE	POSIÇÃO / RESPONSABILIDADE	CONTACTO
27	Afonso dos Santos Lando	Sec. C.C. Dist.		
28	Franco Ussene	Reg. Nuanetsi	NAMPULA	
29	Ernesto Saide	CHEF. DE Povoação	NAMPULA	

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## **Annex D - Questions and Answers Matrix**

**REINFORCEMENT OF THE TRANSMISSION NETWORK IN NACALA CORRIDOR,  
MECONTA DISTRICT, NAMPULA PROVINCE**

**Public engagement in Meconta District**

Venue: Meeting room of the Meconta District Government

Date: 22nd August, 2014

Time: 10.00-12.00 hours

**Questions and Answers Matrix**

Questions	Answers
<p>I thank the team for the presentation of the project. The project is welcome and will solve a problem, which has affected many inhabitants of the district and of Namialo administrative post in particular. However, I would like to know when the project will start.</p> <p><b>Guilhermina Walila - Head of Namialo administrative post</b></p>	<p>No dates have yet been defined for this project. However, as soon as there is a date and a work programme, the local authorities will be informed.</p> <p><b>Victor Daniel - EDM Nampula</b></p>
<p>I would like to know if the project will benefit the population of Namialo.</p> <p><b>Tomás Ernesto - 1<sup>st</sup> Secretary of Micolene</b></p>	<p>The project intends to make the reinforcement of electricity supply in the entire Northern region. As Namialo belongs to the Northern region, it is evident that it will benefit from it.</p> <p><b>Victor Daniel - EDM Nampula</b></p>
<p>The project is welcome and will solve the problem of weak electricity, which the Namialo locality has been suffering. But I would like to recommend that when the project starts to prioritise the contracting of local labour.</p> <p><b>Lucas Victor - 1<sup>st</sup> Secretary of Joaquim Chissano suburb</b></p>	<p>As you could see in the presentation done, the study recommends that in the case of needs for labour, local labour should be prioritised. The representatives of EDM are here present, who will guarantee the fulfilment of the recommendation of the EMP. However, the recommendation has been registered.</p> <p><b>Herberto Nhampanze - IMPACTO Lda.</b></p>
<p>First, I would like to thank for the project coming to the district. After this, I would like to recommend, that EDM selects a serious and honest contractor, because there are many companies that come to work in the district and then abandon the works and the workers without paying their remunerations, and when this is the case, the workers come to the administration to ask for explanations, and often we do not have answers.</p> <p><b>Nesta Mateus - Member of the District</b></p>	<p>The recommendation has been registered. EDM is here present and will, of course, register the suggestions raised here.</p> <p><b>Herberto Nhampanze- IMPACTO Lda.</b></p>

<b>Government</b>	
<p>I would like to know, which is the exact location exacta of the site, where the sub-station will be built, so that we can start with the sensitisation of the communities.</p> <p><b>António Xavier</b></p>	<p>The project will be located in Micolene village</p> <p><b>Victor Daniel - EDM Nampula</b></p>
<p>We recommend that always when you carry out an activity you need to involve the district authorities in order to avoid an overlap of projects in the same area.</p> <p><b>Rosa Vianaque - District Administrator</b></p>	<p>I think that we already heard the complaint regarding the lack of involvement of the local authorities to accompany our activities. It is necessary that we always inform about our projects, because the land can be occupied or another district might show up because of the lack of communication.</p> <p><b>Steven Ferro - EDM Nampula</b></p>
<p>I only thank that you have come to us to transmit this information. They have already apologised for the error of not involving the local leaderships, but they are excused, because the only person not committing errors is the one, who does not work. I also thank IMPACTO Lda. for having elaborated the study, which is very well done. We only regret that we still do not know the location for implementing the project, but we will do so during this week. This project is welcome, because it will bring development, the arrival of electricity has raised excitement amongst the communities, because now all want to have electricity, but this will be done in phases, so that we will have quality electricity.</p> <p><b>Rosa Vianaque - District Administrator</b></p>	<p>Comment registered.</p>

#### 1 4 . 簡易用地補償計画 (SLUCP)



Prepared by:



Prepared for:



**ENVIRONMENTAL AND SOCIAL  
CONSIDERATION SURVEY (ESCS)  
FOR PREPARATORY SURVEY ON  
THE PROJECT FOR  
REINFORCEMENT OF  
TRANSMISSION NETWORK IN  
NACALA CORRIDOR IN THE  
REPUBLIC OF MOZAMBIQUE**

**Simplified Land Use Compensation  
Plan (SLUCP)**

**January 2015**

**THE PRESENT DOCUMENT COMPRISES:**

PART 1: EXECUTIVE SUMMARY

PART 2: SIMPLIFIED LAND-USE COMPENSATION PLAN

## ACRONYMS AND ABBREVIATION

DUAT	Direito de Uso e Aproveitamento da Terra ( <i>right of use and benefit of land</i> )
DPA	Direcção Provincial de Agricultura ( <i>Provincial Directorate of Agriculture</i> )
EDM	Electricidade de Moçambique, E.P.
ESIA	Environmental and Social Impact Assessment
HH	Household Head
JICA	Japanese International Cooperation Agency
MICOA	Ministry for the Coordination of Environmental Affairs
MZM	Mozambican Meticals
PAP	Project Affected Persons
ROW	Right-of-Way
RU	Relocation Unit
SES	Socio-Economic Survey
SLUCP	Simplified Land Use Compensation Plan
TL	Transmission Line

## DEFINITIONS OF TERMS

<b>Assistance</b>	Support, rehabilitation and restoration measures extended in cash and/or kind above the compensation for lost assets.
<b>Census</b>	The field survey carried out to identify and determine the number of Project Affected Persons (PAP) and their assets, in accordance with the internationally accepted procedures satisfactory to JICA Policies. The meaning of the word also embraces the criteria for eligibility for compensation, relocation and other measures, emanating from consultations with affected communities and the local leaders within the project area.
<b>Compensation</b>	Cash or payment-in-kind to which the affected persons are entitled, in order to replace the lost assets, resources or income, at the time it needs to be replaced.
<b>Cut-Off Date</b>	Date of completion of the census and assets inventory of persons affected by the Project. Persons occupying the Project area after the Cut-off date are not eligible for land and assets entitlements.
<b>Entitlement</b>	A variety of measures including compensation, income restoration and interim support, transfer assistance, relocation and other benefits that is due to affected persons, depending on the nature or their losses, to improve their economic and social base.
<b>Entitlement matrix</b>	Identifies categories of eligible persons and the specific entitlements for each category.
<b>Encroachers</b>	Those people who move into the project area after the cut-off date and are therefore not eligible for compensation or other rehabilitation measures provided by the project.
<b>Grievance Procedures</b>	The processes established under administrative decision to enable project affected persons to redress issues related to acquisition, compensation, or other aspects.
<b>Household</b>	A household includes all persons living as a single-family unit sharing the same space.
<b>Income restoration</b>	Re-establishing income sources and livelihoods of affected persons.
<b>Inventory of losses</b>	Complete and accurate count of the persons, households, land, business and other assets on the land that is affected by the project.
<b>Involuntary Resettlement / Resettlement</b>	The unavoidable displacement of people arising from development projects that creates the need for rebuilding their livelihood, income and asset bases in another location (i.e displacement of people from their homes, lands, livelihoods).
<b>Project Affected Persons (PAP)</b>	Any person, who as a result of the implementation of a project, loses the right to own, use, or otherwise benefit from a built structure, land, annual or perennial crops and trees, or any other fixed or moveable asset, either in full or in part, permanently or temporarily.



<b>Relocation</b>	Moving of affected person's properties and economic activity (i.e farms, shops) to another location.
<b>Replacement cost</b>	The method of valuation of assets that helps determine the amount sufficient to replace lost assets and cover transaction costs. In applying this method of valuation, depreciation of structures and assets should not be taken into account. For losses that cannot easily be valued or compensated for in monetary terms such as farmlands, attempts are made to establish access to equivalent and culturally acceptable resources and earning opportunities. <b>In a land in rural area</b> , replacement cost is defined as the pre-project or pre-displacement value, whichever is higher, of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes.
<b>Compensation Budget</b>	A detailed breakdown of all the costs of a compensation plan phased over the implementation period.
<b>Vulnerable groups</b>	Distinct groups of people who might suffer disproportionately from displacement effects, such as, the old, the young, the handicapped, the poor, isolated groups and single heads of households.

## **PART 1**

### **EXECUTIVE SUMMARY**

## EXECUTIVE SUMMARY

The reinforcement of the transmission network in the Nacala corridor project is a small-scale project that falls under the area of influence of the already approved ESIA study by Ministry for the Coordination of Environmental Affairs (MICOA) for the NORCONSULT Feasibility Study on Chimuará-Nacala Transmission Project, completed in October 2013.

The main objective of this Simplified Land Use Compensation Plan (SLUCP) is to address the social impacts of the project and ensure the successful restoration and improvement of the living standards, income earning capacity and production levels of Project Affected Persons (PAP). To compensate for the socioeconomic losses the study proposes a comprehensive compensation package.

The general guiding principles for achieving the objective of this SLUCP are, among others, that there should be fair compensation upon land acquisition, relocation, loss of assets and impact on livelihood.

The proposed site is located in Namialo area, in the administrative district of Meconta, Nampula Province. The gross land area required for the construction of the new substation is about 25 hectares.

The SLUCP was drafted by taking into account the data generated through Socio-Economic Survey of all the project affected persons.

The socioeconomic survey was done covering 100% of the project affected Household Head (HH) with farming activity within the project area.

The socioeconomic survey collected a wide range of data, such as, demography, number of affected households; members of the affected households, sources of livelihood, age/sex distribution, education, occupation, income, types and ownership status of affected land, vulnerability, etc.

The socioeconomic survey revealed the following findings:

- The majority of the PAP is ethnically Makhua;
- The common spoken language is Emakhuma;
- Society is characterized as being matriarchal;
- PAP obtain their income from agriculture;
- None of the 19 household heads interviewed have a written DUAT title for the land they use.
- 42% of HH are female;
- The gender balance among PAP is fairly even;
- The average household size consists on 7.7 members;

- 37% of all household heads in the project area are single;
- The population in the project area are relatively young with over 50% aged under 20;
- 67% of males on the project area attended to primary school;
- 8% of the PAP are to be considered vulnerable;
- The average size of farm within the project area is 0.32 hectares;

In regarding to assets there are approximately 1,708 fruit trees, with economic value, that will be lost to the project.

In respect to the total project proposed area, 25 hectare, only approximately 3.0 hectares were in fact cultivated.

The fundamental principle of the SLUCP is that all persons, regardless the type of ownership, occupying, using or doing income generation activities inside the project area are eligible for a compensation package.

Thus, agricultural land within the proposed site for the construction of the new substation and access road will be compensated in kind, including replacement cost.

The Nampula Directorates of Agriculture provided the unit price for calculating compensation values for crops and trees through the table of price for food crops for compensation for loss of harvests (Refer to Annex A).

Thus, each affected crops were valued in the following way:

Crop area x crop price

And each fruit trees were valued as following:

Fruit tree x price

The total estimated value of the assets affected by project is approximately 554,515.00 Mozambican Meticaís, 151,015.00MZM associated to the affected crops and 403,500.00MZM in regarding to the valuation of fruit trees.

The **Constitution of the Republic of Mozambique** states, in its fundamental principle, that all natural resources and means of production are public property of collective interest. Thereby, the land belongs to the State and the right to use it can only be granted by the State through a formal land use title (DUAT). Article 9 of the Land Law, however, fully recognizes the legitimacy of the occupation of land by individuals or communities, when made according to customary principles.

Under the Mozambican **Law on Territorial Organization** a fair compensation must be paid for loss of property and/or the loss of means of livelihood induced by the project.

Although in recent years the national legislation has been changed significantly as a result of the need for greater protection of the public interests and their property, a gap between existing legal framework of Mozambique and requirements of the JICA guidelines is still there, especially regarding to compensation for losses.

Gaps between Mozambican legislation and JICA Guideline, in the context of the SLUCP, are presented on chapter 3.3.

The following table provides an entitlement matrix for losses incurred by PAP.

Item N°	Type of loss	Entitled Person (Beneficiaries)	Entitlement (compensation Package)	Responsible organization
1	Loss of agricultural land (permanent)	Owners with traditional rights to the agricultural land located inside the project site	Compensation in kind. Replacement land with at least the same size and productivity potential. Assistance in kind: New land preparation, including payment for wages, at market price by employer.	Proponent (EDM) or Subcontracted entity
		Tenant of agricultural land located inside the project site	No compensation for loss of land; Compensation for loss of crops	Proponent (EDM) or Subcontracted entity
2	Loss of cropping areas	Owner of crops located inside the project site	Monetary compensation based on the relevant agriculture crop loss compensation tables as legally determined by the Nampula Provincial Directorate of Agriculture (DPA-Nampula). The compensation tables could be referred to in Annex A of this SLUCP Report. The compensation is based on the current market price and productivity values for various annual and permanent crops. Assistance in kind: Seeds will be provided.	Proponent (EDM) or Subcontracted entity
3	Loss of fruit trees	Owner of fruits trees located in the project site	Monetary compensation based on the relevant fruit tree loss compensation tables provided by the Nampula Provincial Directorate of Agriculture (DPA-Nampula) as referred above. Replacement trees: For each loss trees two trees will be replaced.	Proponent (EDM) or Subcontracted entity

The implementation of the Simplified Land Use Compensation Plan it proposed to be pursued by EDM in cooperation with Nampula Provincial Government, Meconta District Administration, Nampula Provincial Directorate of Agriculture, Nampula Provincial Services of Geography and Cadastre as well as with the Traditional Authorities.

In addition, EDM may set up a Compensation Advisory Committee at the project level to involve the local community in the implementation process.

The Committee will ensure local participation in the implementation of the SLUCP and provide support to PAP on grievance resolution.

Appropriated conflict resolution mechanisms will be established in order to ensure that the grievance is well addressed. When conflicts cannot be resolved at the Project level, formal second instance mechanisms will be required.

EDM shall establish a Relocation Unit, an internal monitoring system for collection, analysis and reporting on SLUCP progress. In addition, an independent external monitoring and evaluation agency will be commissioned for monitoring the impact of the SLUCP implementation and periodic evaluation of compensation process and final outcome.

The performance indicators will be listed and monitored by means of the two monitoring mechanisms.

A total estimated time of 14 month is suggested for the implementation of SLUCP. The proposed process for compensation and posterior reallocation will occur within the first 4 months. Additional 10 months will be required for monitoring PAP and ensure that livelihood and income have improved at least to the pre-project standard, by allowing the monitoring to cover at least 2 harvest seasons.

In order to implement the Simplified Land Use Compensation Plan on the Project for Reinforcement of Transmission Network in the Nacala Corridor a grand total of 1,337,515.00 Mozambican Meticais is estimated to be necessary.

## **PART 2**

### **SIMPLIFIED LAND-USE COMPENSATION PLAN**

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## 1 INTRODUCTION

### 1.1 Objective

The main objective of this Simplified Land Use Compensation Plan (SLUCP) is to address the social impacts of the project and ensure the successful restoration and improvement of the living standards, income earning capacity and production levels of Project Affected Persons (PAP).

Thereby, it aims to ensure that no affected person shall be worse off as a result of the Project and that PAP are provided with sufficient compensation and assistance for lost assets which will help them improve or at least restore their pre-project standard of living.

To compensate for the socioeconomic losses the study will also propose a comprehensive compensation package so that the affected persons at least can restore their pre-project socio-economic standard.

The general guiding principles for achieving the objective of this SLUCP are, among others, that there should be fair compensation upon land acquisition, relocation, loss of assets and impact on livelihood.

In this sense, in order to mitigate the socio-economic impact of the project on PAP, the SLUCP purposes are: 1) to assess the impacts and to determine compensation for losses by PAP; 2) to present organizational responsibilities for implementation of the SLUCP; 3) to prepare an implementation schedule; 4) to prepare an implementation budget for the SLUCP and; 5) to prepare monitoring and evaluation mechanisms for implementation process.

The SLUCP was drafted by taking into account the data generated through Socio-Economic Survey (SES) of all the project affected persons and the results of meetings with different stakeholders.

The present study was conducted in accordance with environmental guidelines for Category B Project of Japan International Cooperation Agency (JICA) in addition to technical compliancy of the environmental guidelines of Mozambique for Category B Project.

The reinforcement of the transmission network in the Nacala corridor project is a small-scale project that falls under the area of influence of the already approved ESIA study by Ministry for the Coordination of Environmental Affairs (MICOA) for the NORCONSULT Feasibility Study on Chimuara-Nacala Transmission Project, completed in October 2013.

According to the National legislation, no further ESIA study for the project is required.

Still, in order to meet the JICA Guidelines for Category B projects a Simplified Land Use Compensation Plan must be conducted.

## 1.2 Project Description

The project aims to reinforce the transmission network in the Nacala corridor. For this purpose, the construction of a new electricity transformer substation located along the Right-of-Way (ROW) of an already existing power transmission line (TL) and a new access road is planned.

The proposed site for this new substation is located at the deviation point of the two existing transmission lines, one to Nacala and the other to Metoro. This substation location at 2 parallel transmission lines facilitates the availability of wider width area of ROW for the substation. The gross land area required for the construction of the new substation is about 10 hectares.

The new access road is located along 1.5 km in length of the existing 110kV high voltage power transmission line to Metoro and aim to facilitate effective transportation of construction materials and equipment from the EN12 (National Road 12) to the substation.

Therefore, significant part of the project facilities of both the access road and substation is expected to be provided within the existing ROW of the transmission lines under the jurisdiction of the project proponent, Electricidade de Moçambique, E.P. (EDM).

## 1.3 Project Site

The project site is located in Namialo area, in the administrative district of Meconta, Nampula Province.

The present study will address the affected households, population and asset throughout the entire gross land area of 25 hectares, 10 ha for the proposed site for the new substation project and 15 ha for the new access road.

It may be mentioned that the electricity transformer substation will have to be constructed from scratch which may require land acquisition at the selected place of Namialo.

The project site (Figure 1) is basically located in an area that is open/vacant lands interspersed with small-scale agricultural subsistence oriented farmlands, machambas, with no human settlements. There is no housing/human settlement in the gross 100m of ROW located along the TL planned for the project facilities of access road and substation.



**Figure 1- Map of Namialo Substation proposed Site**

Given the location of the project no physical reallocation is expected to be conducted, although, the project may generate temporary economic displacement to PAP with economic activity along the site. The impacts are mostly on annual crop, trees and land.

In this sense, land users will only be compensated by the loss of income earning capacity (production levels).



Figure 2 - View of project area

According to JICA guideline involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives.

The choice of the project site has followed this principle in the sense that both access road and substation is expected to be provided within the area of existing ROW of the transmission lines under the jurisdiction of EDM. On the other hand, all alternatives that have been studied generate major impact (involuntary resettlement and loss of means of livelihood) on the community. For this reason the choice of the actual site results from prior analyses that aimed to minimize and avoid involuntary resettlement and loss of means of livelihood.

## 2 SOCIO-ECONOMIC SURVEY AND DATA ANALYSIS

The census covered the totality of the project area and all owner of the small farmland (machambas) were inquired. This section summarizes the findings of the census and socioeconomic surveys and thus describes project impacts as well as a socioeconomic overview over PAP.

### 2.1 Methodology for Socioeconomic Survey and Census on PAP

The approach adopted to conduct socio-economic study is described below. The study has been conducted in accordance with both JICA guidelines and the Mozambique guidelines.

The census and a socio-economic survey was carried out in July 18th to provide essential details on the project affected persons (PAP) and further assess the magnitude of likely impacts on the livelihood. (See Data Collection Report)

The socioeconomic survey was done covering 100% of the project affected Household Head (HH) with farming activity within the project area. The identification of the farmers and land holders inside the project area was made with the help of the traditional authority that follows the socioeconomic team from day one through all stages.

In addition, the presence of a local translator was required to facilitate the communication between the team and the local community.

Based on the ROW identified by the technical engineers and marked on cadastral maps, the survey team covered small farmland within the project proposed site and the access road with a corridor width of 100 meters.

The survey included:

- (i) Census of the project affected persons;
- (ii) Socioeconomic survey of the households heads with farmlands in the project area;
- (iii) Measurements of the farmland that needs to be compensated;
- (iv) Inventory of losses. Identification of specific crops and fruit trees in the farmlands;
- (v) Photography of the affected properties, both farmland and trees;

The survey team also carried out in depth interviews with the secretary of the affected area and the secretary of the nearest area on their socioeconomic conditions and to obtain further detailed information on

their opinion with regard to the project, displacement and income restoration.

The socioeconomic survey collected a wide range of data, such as demography, number of affected households; members of the affected households, sources of livelihood, age/sex distribution, education, occupation, income data, types and ownership status of affected land, vulnerability, etc.

As procedure, signatures from the inquired HH, the secretary of the affected area and a witness were required on the last sheet of the questionnaire stating the exact details of assets held at the time of the survey. For record purposes and to avoid conflict, household heads were photographed while signing and holding a census ID card. (See Annex I)

## 2.2 Livelihoods

Both project site and access road are located in an area with no human settlement. The area is characterized by small plots of farmland, machambas, where the local community cultivates, mostly subsistence agriculture.

The nearest locality is Micolene, where most of the PAP lives. The majority of the project affected persons is ethnically Makhua.

Although the official language in Mozambique is Portuguese, most of the PAP do not speak Portuguese fluently. The common spoken language among the population is Emakhua.

As among Makhuas in general, the local communities residing in the Project's area of influence are matriarchal, women playing an important role in both education of the children and as support of the family. In most cases the woman is the head of family.

All the respondents stated that they obtain their income from agriculture. The main crops in the area are corn, cassava, beans and nuts.

In fact, both male and female participate in the farming activity in order to get food or incomes from selling agricultural surpluses. The products are sold at prices set by the buyers, and the income is used to buy other basic goods and make payments.

Given the small scale of farming activities on project site, no machinery is used and hoes are the only instrument used.



The harvest depends on factors such as seasonality, weather condition and manpower to work the land.

The majority of the houses in Namialo are constructed with traditional methods, walls are made of a combination of wood, clay and adobe, while roof are covered with straw or zinc. Figure 3 shows a traditional house in Namialo.

In general the houses don't have plumbing or electricity. The drinking water originates either from communal wells, holes and/or rivers.

The survey revealed that there are no graves and sacred or culturally important sites in the project area.



**Figure 3 - Traditional house in Namialo**

### **2.3 Results of the Socio-Economic Survey**

A total of 19 household heads with small farmlands and fruit trees on the project site were surveyed through a structured socioeconomic survey questionnaire. This includes 2 households with farmland within the new substation project and 17 households with farmland in the area proposed to be the access road to the project site. This represents 100% of the project affected persons.

All of the 19 household heads interviewed stated that they have not requested the legal title of the land they use, DUAT. However, according to

the Mozambican law, they are entitled to the land either because they have occupied the land for more than ten years or they have been allocated by the local traditional authorities.

Two cases of leased land were reported within the access road area.

The Table 1 below presents the number of affected household heads based on the census survey.

**Table 1 - Number of Surveyed Households Head**

Type of Households Heads	N° of Households Heads	%
Male HH	11	58%
Female HH	8	42%
<b>Total HH</b>	<b>19</b>	<b>100%</b>

Source: SLUCP team

It must be pointed out that all 19 questioners were answered by HH only, and out of total affected households 42% is female headed and 58% is male headed.

The Gender balance among the project population (PAP) is fairly even at 47% male and 53% female, as shown in Table 2.

With regards to losses, the following table does not discriminate the losses associated with fruit trees or crop since in many cases there is an overlap between the owners of farmland and the owners of crops and fruit trees. This subject will be discussed in detail on the following chapters.

**Table 2 - Number of Affected Households by type of loss**

Type of Loss		N° of Households Heads	%of Households Heads	N° of PAP	% of PAP
Land owners	Male	11	58%	57	39%
	Female	6	32%	68	47%
Land lease holder	Male	0	0%	12	8%
	Female	2	11%	9	6%
<b>Total</b>		<b>19</b>	<b>100%</b>	<b>146</b>	<b>100%</b>

Source: SLUCP team

The average household size consists on 7.7 members. Although it may seem like a high number, it should be taken into account the fact that Namialo is a rural area where polygamy is normal and the number of children in a family represents agricultural extra labour. Furthermore, many households

include extended-family dependents such as aunts, brothers, grandmothers, mothers in law.

It must also be referred that approximately 37% of all household heads in the project area are single and that approximately 63% of female household heads are single, divorced or widowed (Table 3).

**Table 3 - Marital status of PAP by Gender and Age**

Marital Status	Gender	Total	Age						
			10 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 - 70	Above 71
Married	Male	25	4	5	3	5	3	4	1
	Female	32	1	11	12	5	2	1	0
Single	Male	28	20	5	3	0	0	0	0
	Female	22	15	1	2	2	2	0	0
Widower /widow	Male	0	0	0	0	0	0	0	0
	Female	2	0	1	0	0	0	0	1
Divorced	Male	0	0	0	0	0	0	0	0
	Female	3	0	1	0	1	0	1	0
<b>Total</b>		<b>112</b>	<b>40</b>	<b>24</b>	<b>20</b>	<b>13</b>	<b>7</b>	<b>6</b>	<b>2</b>

Source: SLUCP team

In the community females tend to get married at the age of 20 while males only get married at the age of 30.

The population in the project area, both male and female, are relatively young, with over 50% aged under 20, 18% aged between 21 and 30 years old. Only 10% of the population are aged over 51 years (Table 4). The average age of the PAP is 27.6 years.

**Table 4 - Distribution of PAP by Age and Gender**

Age Group	Male		Female		Total	
	N°. PAP	%	N°. PAP	%	N°. PAP	%
1 - 10	16	23%	18	23%	34	23%
11 - 20	24	35%	16	21%	40	27%
21 - 30	10	14%	14	18%	24	16%
31 - 40	6	9%	14	18%	20	14%
41 - 50	5	7%	8	10%	13	9%
51 - 60	3	4%	4	5%	7	5%
61 - 70	4	6%	2	3%	6	4%
Above 71	1	1%	1	1%	2	1%
<b>Total</b>	<b>69</b>	<b>100%</b>	<b>77</b>	<b>100%</b>	<b>146</b>	<b>100%</b>

Source: SLUCP team

However, the average age of the household head is 53.5 years. The female HH are in average younger than male HH, approximately 47 year and 58 years respectively.

In rural areas such as Namialo the education levels are generally low. There is a trade-off between education and contribution to the household income. The general idea is that a child represents labour force and thereby wealth since they can earn money (on the informal market) or help on the farm augmenting the family income. On the other hand, school represents expenses to the parents.

In this sense, the grand majority of children drop out of school on the secondary level.

According to the result of the census (Table 5), males tend to have more formal education than females. In fact, 67% of males on the project area attended to primary school while only 60% of female attended to primary school.

**Table 5 - Distribution of PAP by Education Level and Gender**

Age Group	Male		Female		Total	
	N°. PAP	%	N°. PAP	%	N°. PAP	%
None	22	32%	31	40%	53	36%
Attended Primary school	46	67%	46	60%	92	63%
Concluded Primary school	1	1%	0	0%	1	1%
Attended Secondary school	0	0%	0	0%	0	0%
Concluded Secondary school	0	0%	0	0%	0	0%
Attended to college	0	0%	0	0%	0	0%
<b>Total</b>	<b>69</b>	<b>100%</b>	<b>77</b>	<b>100%</b>	<b>146</b>	<b>100%</b>

Source: SLUCP team

There are high levels of illiteracy among the project population. Indeed, 36% of adult household members have no education at all and only one PAP attended to secondary school. Those results do not include children between 1 and 8 year old since they are too young to attend to primary school.

According to JICA guideline, particular attention must be paid to the needs of the vulnerable groups among those displaced. Thus, at all stages of SLUCP, all project affected persons considered to be vulnerable should be properly monitored in order to ensure a successful restoration and/or improvement of the living standards, income earning capability and

production. In other words, ensure that no vulnerable persons shall be worse off as result of the project. Table 6 depicts the number of vulnerable PAP in the area.

**Table 6 - Number of Vulnerable PAP**

Type of Vulnerability	Vulnerable Male		Vulnerable Female		Total	
	Number	%	Number	%	Number	%
Physical Disabilities	2	67%	1	11%	3	25%
Single Mother	0	0%	3	33%	3	25%
elderly Person (>60 years)	1	33%	5	56%	6	50%
<b>Total Vulnerable PAP</b>	<b>3</b>	<b>100%</b>	<b>9</b>	<b>100%</b>	<b>12</b>	<b>100%</b>
<b>% (Vulnerable/Total)</b>	<b>4%</b>		<b>12%</b>		<b>8%</b>	

Source: SLUCP team

Vulnerability situations recorded during the survey are as follows (Table 6):

- 8% of the PAP are to be considered vulnerable (12 vulnerable persons);
- In the universe of vulnerable persons, women are more vulnerable than men. 75% of vulnerable PAP are female.
- There are 3 persons with physical disabilities;
- Special attention must be given to elderly persons, 50% of the venerable group.
- There is one vulnerable person per household, therefore there is a total of 12 households with vulnerable people.

Difficulties arose when collecting PAP annual income level information. On one hand, people were not receptive to report their annual income. On the other, the annual household income is highly dependent on the production capacity of farms since it is the only income source. Thus, in this case the best performance indicator on household annual income may be the size of farms.

The total farming area within the project site is 9.7 hectares.

On average, a farm within the project area measures 0.32 hectares (Table 7).

**Table 7 - Total and average size of the Farmlands**

Household head	N° of farmland	Total size (ha)	Average size (ha)
Male	11	3.3 ha	0.30 ha
Female	20	6.5 ha	0.33 ha
<b>Total</b>	<b>31</b>	<b>9.8 ha</b>	<b>0.32 ha</b>

Source: SLUCP team

Survey results indicate that, on average, farmlands owned by a female household head are larger than male headed household farmlands. Households typically have between one and four farmlands.

According to the respondents, commuting between the family house and the family farmland typically takes between 30 and 90 minutes, by foot (see Table 8).

**Table 8 - Time expended to the farmland (daily)**

N° of HH	Time Spend (min)						
	0 - 15 m	16 - 30 m	31 - 45 m	46 - 60 m	61 -75 m	76 - 90 m	More than 90 m
<b>Male</b>	0	2	4	4	0	1	0
<b>Female</b>	0	3	2	1	0	2	0
<b>Total</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>0</b>

Source: SLUCP team

The majority of PAP takes between 30 and 60 minutes to walk from their houses to the farmland. Those are the PAP located within the access road area. Households having agricultural plots located on the substation project site spend, on average, more time to access the land. Access to the farmland can only be done by foot.

## 2.4 Inventory of Affected Assets

The socioeconomic survey revealed that within the project area there are approximately 1,708 fruit trees with economic value that will be lost to the project. Those trees play an important role in the local economy since they provide fruits that are typically consumed or traded.

The Table 9 presents the varieties of fruit trees affected by the project.

**Table 9 - Number of fruits trees affected**

Type of tree	N.º of Fruit Trees
<b>Banana</b>	1,498
<b>Cashew</b>	164
<b>Mango</b>	40
<b>Pear</b>	1
<b>Guava</b>	4
<b>Papaya</b>	1
<b>Total</b>	<b>1,708</b>

Source: SLUCP team

It must be referred that at the moment that the socio-economic survey was conducted most of the farmlands were not cultivated due to seasonality of the main crops.

On this sense, in respect to the total project proposed area, 25 hectare, only approximately 0.3 hectares were in fact cultivated (Table 10).

**Table 10 - Type of crops and cropped area affected**

Type of Crop	Area of Plantation (ha)
Cassava	0.22 ha
Beans	0.07 ha
<b>Total</b>	<b>0.29 ha</b>

Source: SLUCP team

The following Table 11 resumes the inventory of asset affected by the implementation of the project and that can be eligible for compensation.

**Table 11 - Total of farmland and fruit trees within the project area**

Area	N° of Household head	N° of farmland	Size (ha)	N° of trees
Substation	2	10	3.23 ha	183
Access road	17	21	6.54 ha	1,525
<b>Total</b>	<b>19</b>	<b>31</b>	<b>9.77 ha</b>	<b>1,708</b>

Source: SLUCP team

## 2.5 Valuation of Assets

The fundamental principle of the SLUCP is that all persons, regardless the type of ownership, occupying, using or doing income generation activities inside the project area at the cut-off date are eligible for a compensation package.

Thus, loss of agricultural land within the proposed site for the construction of the new substation and access road will be compensated in kind, including replacement cost. As such no financial valuation was made for loss of farmlands. The terms of such compensation will be presented on the entitlement chapter.

The Nampula Directorate of Agriculture provided the unit price for calculating compensation values for crops and trees. The table of price for food crops for compensation for loss of harvests produced by the Nampula Directorate of Agriculture is presented in Annex A.

During the public consultations PAP were informed of the method of valuation of their assets.

Annex B presents a detailed inventory of asset and its valuation for each PAP.

The following sections describe the methods by which compensation for both fruit trees and crops were calculated.

### 2.5.1 Valuation of Crops

The crops were assessed based on the formula established by the Nampula Directorate of Agriculture. The calculation of compensation value of each plant depends on the type of plant and the production area.

Since plots can have more than one type of crop, the methodology adopted in the valuation process was to consider only the plant with highest economic value and attribute it to the all plot.

In the small plots existing within the project site the main crops produced are cassava and beans.

Thus, each affected crops were valued in the following way:

$$\text{Crop area} \times \text{crop price}$$

Table 12 presents the valuations of the crops identify by the census at the cut-of date.

The valuation on the cassava does not depend on the cropped area size. It depends of the number of cassava trees.

**Table 12 - Valuation of affected crops**

Type of affected Crop	Total Crop Area (m <sup>2</sup> )	Price (MZM)	Total Crop Value (MZM)
Cassava	22,137	5.00	1,015.00
Beans	7,500	20.00	150,000.00
Total	29,637		151,015.00

Source: SLUCP team



## 2.5.2 Valuation of Fruit Trees

The value of each fruit tree were also estimated in accordance with the “table of cost for food crops for compensation for loss of harvests” provided by the Nampula Directorate of Agriculture.

In the assessment of the value of fruit tree the age of the tree and the stage of reproduction were taken into account.

Each fruit trees were valued as following:

$$\text{Fruit tree} \times \text{price}$$

As presented on Table 13, 1,708 fruit trees were identify in the proposed project site, among them there are banana, cashew and mango trees.

**Table 13 - Valuation of affected fruit trees**

Type of affected tree	N.º of Fruit Tree	Price (MZM)	Total Tree Value
<b>Banana</b>	1,498	150.00	224,700.00
<b>Cashew</b>	164	1,000.00	164,000.00
<b>Mango</b>	40	300.00	12,000.00
<b>Pear</b>	1	500.00	500.00
<b>Guava</b>	4	500.00	2,000.00
<b>Papaya</b>	1	300.00	300.00
<b>Total</b>	<b>1,708</b>		<b>403,500.00</b>

Source: SLUCP team

Thus, the total estimated value of the assets affected by project is approximately 554,515.00 Mozambican Meticais (Table 14).

**Table 14 - Total valuation of assets affected**

Type of asset	Total Value (MZM)
<b>Crops</b>	151,015.00
<b>Fruit Trees</b>	403,500.00
<b>Total</b>	<b>554,515.00</b>

Source: SLUCP team

### 3 POLICY AND LEGAL FRAMEWORK

This chapter briefly sets out the following:

- Mozambican legislation regarding to resettlement and compensation
- JICA's policy on involuntary resettlement
- Gap Analysis between JICA Guideline and Mozambican Policy

#### 3.1 Mozambican Policy and Legal Framework

The **Constitution of the Republic of Mozambique** states, in its fundamental principle, that all natural resources and means of production are public property of collective interest. Thereby, the land belongs to the State and the right to use it can only be granted by the State through a formal land use title (DUAT).

This position is corroborated by the Land Law (**Law 19/97 of 1 October**) that covers regulation for the key aspects of land occupation and use in Mozambique. According to the land Law all land belongs to the State and cannot be sold, transferred, mortgaged or pledged (Land Law, Article 2).

However, although land is owned by the State, all Mozambicans citizens (regardless of gender), legal persons and local communities have the right to use and enjoy the land or the right to land use and benefits thereto (Land Law, Article 3).

Article 9 of the Land Law recognizes the legitimacy of the occupation of land by individuals or communities via traditional structures, customary right, while Article 10 provides for the rights derived from the occupation of land by Mozambican individuals, when the occupation is in good faith and extends for more than 10 years, even without a regular title. Thus, the absence of formal written title (DUAT) issued by the official cadastral services does not imply any loss of rights over land.

Under the DUAT, the right for use and exploitation of land for economic activities is granted for a maximum period of 50 years, renewable for an equal period on request by the interested party (Article 17). The right of use and exploitation of land occupied by traditional communities is not limited by any term (Art.17-2).

A Land-use title, DUAT, or obtained by customary norms and practice, may be revoked where this is in the public interest, preceded by provision of fair compensation (Article 18). Procedures for the termination of a land title in

the public interest must follow expropriation procedures and after payment of fair compensation;

In Article 13 is recognized the role Local communities and in the identification and definition of the boundaries of the land they occupy and the process for obtaining the title. In addition, communities are involved in both natural resource management and conflict resolution processes. The articulation procedures between local State authorities and community leaderships (local councils, community leaders and zone secretaries) are described by **Decree-Law 15/2000**.

The **Framework Environmental Law** (1997) provides the legal framework for the use and sustainable management of the environment and seeks to protect environmental components with recognized ecological and socioeconomic values. The law is applicable to all public and private activities that direct or indirectly affect the environment with or without significant impact.

The **Environmental Impact Assessment Regulation** approved on 29th of September 2004 (Decree N<sup>o</sup>. 45/2004) provide the framework for the responsibility and conduct of Environmental Impact Assessment for various infrastructure projects and highlight the importance of the public consultation process in carrying out EIA studies and in development of environmental management plans.

According to this regulation the granting of an environmental license is a prerequisite to a range of development activities defined in the Regulations. The process of EIA in Mozambique follows a set of protocols in the Environmental Impact Assessment regulations (defined by MICOA's guideline) and the extent of the EA is decided upon by the National Directorate of Environmental Impact Assessment from MICOA after review of the Registration Process containing among others, an environmental screening form.

As the results of this environmental screening, a project is given environmental category which consists of three, Category "A", Category "B" and Category "C", in accordance with the degree of predicted negative impacts on social and nature environment.

The Table 15 below provides a brief overview of the Environmental Impact Assessment Regulation in regard to categories as well as the requirement of each category.

**Table 15 - Environmental categories, impact and requirement under Environmental Impact Assessment Regulation**

Category	Impact	Requirement
Category A	Significant and irreversible impact is predicted by the project implementation	Environmental Impact Assessment (EIA) and at least of one public consultation are required
Category B	The adverse impact is predicted but the impact level may not be significant comparing with Category A.	Simplified Environmental Impact Assessment Report is required. In case of relocation of people is involved with a project then the project is required to hold at least of one public consultation
Category C	The adverse impact is predicted to be low or none	No requirement. However the appropriate environmental management including the monitoring is required

The specific scale standards and the pre-requirement conditions for the classification of the project are described in detail on the regulation.

Once an environmental license has been granted the proponent can begin the process of project implementation.

The Mozambican **Law on Territorial Organization** was established in 2007 and enforced the need for spatial organization in rural areas as well as the principles of public participation, rights to information and equality of opportunity in access to land, infrastructure and services.

Under this law, fair compensation must be paid for loss of property and/or the loss of means of livelihood induced by the project.

The Law on Territorial Organization is complemented by the **Regulations of the Law on Territorial Organization** promulgated in 2008 (Decree 23/2008), which regulates the bases for calculating compensations for loss of assets and stipulate that the payment must take place prior to expropriation. According to the regulation compensation may be in cash or in kind and it should not only cover the real value of expropriated assets, but also damage and loss of profit. Moreover, a social cohesion disruption coefficient should be applied in the calculation of the compensation package. Compensation for crops should take into account several factors such as the life-span, age, productive period, average annual yield, as well

as a coefficient (between 0 and 1) on the crop condition and factors that may affect crop performance.

The **Ministerial Diploma 181/2010** of 3 of November regulates the process of expropriation for projects declared as being of public interest. The directive contains specific guidelines to the compensation of losses induced by Projects. A basic guide on compensation for permanent and annual crops is provided and updated by the Provincial Directorates of Agriculture. It covers the current market price and productivity values for various annual and permanent crops.

### 3.2 JICA Policy

The key principle of JICA policies on involuntary resettlement is summarized below:

- Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives.
- When population displacement is unavoidable, effective measures to minimise the impact and to compensate for losses should be taken.
- People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported, so that they can improve or at least restore their standard of living, income opportunities and production levels to pre-project levels.
- Compensation must be based on the full replacement cost as much as possible. For the propose of the project JICA guideline states that the replacement cost for an agricultural land must reflect the market value of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes.
- Compensation and other kinds of assistance must be provided prior to displacement.
- For projects that entail large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. It is desirable that the resettlement action plan include elements laid out in the World Bank Safeguard Policy, OP 4.12.
- In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people.

- Appropriate participation of affected people must be promoted in planning, implementation, and monitoring of resettlement action plans.
- Appropriate and accessible grievance mechanisms must be established for the affected people and their communities.

It may be mentioned the JICA's overall policy on Involuntary Resettlement is almost similar to those of other donors' policy in this respect.

Thus, the above principle is complemented by the World Bank OP 4.12, since it is stated in JICA Guideline that "JICA confirms that projects do not deviate significantly from the World Bank's Safeguard Policies". Additional key principle based on World Bank OP 4.12 is as follows.

- Affected people are to be identified and recorded as early as possible in order to establish their eligibility through an initial baseline survey (including population census that serves as an eligibility cut-off date, asset inventory, and socioeconomic survey), preferably at the project identification stage, to prevent a subsequent influx of encroachers of others who wish to take advance of such benefits.
- Eligibility of Benefits include, the PAP who have formal legal rights to land (including customary and traditional land rights recognized under law), the PAP who don't have formal legal rights to land at the time of census but have a claim to such land or assets and the PAP who have no recognizable legal right to the land they are occupying.
- Preference should be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based.
- Provide support for the transition period (between displacement and livelihood restoration).
- Particular attention must be paid to the needs of the vulnerable groups among those displaced, especially those below the poverty line, landless, elderly, women and children, ethnic minorities etc.
- For projects that entail land acquisition or involuntary resettlement of fewer than 200 people, abbreviated resettlement plan is to be prepared.

In addition to the above core principles on the JICA policy, it also laid emphasis on a detailed resettlement policy inclusive of all the above points; project specific resettlement plan; institutional framework for implementation; monitoring and evaluation mechanism; time schedule for implementation; and, detailed Financial Plan etc.

### 3.3 Gap between Mozambican Legislation and JICA Policy

Although in recent years the national legislation has been changed significantly as a result of the need for greater protection of the public interests and their property, a gap between existing legal framework of Mozambique and requirements of the JICA guidelines is still there, especially regarding to compensation for losses.

The Land Law Legislation has captured internationally innovative features that facilitate equitable development, based on relations that are mutually beneficial to local communities and to investors whether these are national or foreign.

JICA's guideline results from a set of lessons and best practices of the resettlement/displacement process in different countries of the world.

These practices have been optimized in order to minimize risks associated with the process maximizing the benefits, especially with regards to the affected people and the most vulnerable.

Therefore, the present SLUCP adopted the policies and procedures set out in the guideline JICA, jointly with the best practices established by national legislation. As result, the SLUCP represents the harmonization between the two instruments safeguarding, whenever possible, the best interest of PAP. So where Mozambican legislation differs or do not mention specific issues, the principles of JICA guideline will be considered. These issues include the eligibility of persons without legal rights to the land, grievance and redress mechanisms, etc.

Gaps between Mozambican legislation and JICA Guideline, in the context of the SLUCP, are presented on the Table 16 below.

**Table 16 - Gaps between JICA Guideline and Mozambican Legislation**

JICA Guidelines	Mozambican Legislation	Adopted Measure in SLUCP
Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives	There is no provision for this under Mozambican legislation	Others viable alternatives were explored. The adopted solution minimizes the impacts on livelihood with no involuntary resettlement.
Compensation must be based on the full replacement cost as much as possible. For the propose of the project JICA guideline states that the replacement cost for an agricultural land most reflect the market value of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes.	Decree No. 23/2008 states that compensation can be in kind or cash. Although the law requires compensation in market value, compensation are in fact "defined" in the legislation for structures and crops, and any adjustment must be agreed with DPA. On other hand, legislation refers that compensation should reflect depreciation of value of structures through age. National legislation does not predict other kinds of assistance beyond compensation.	Agricultural land will be replaced by new land with equal productive potential located as close as possible of the current farmland. Crops will be compensated with market value defined by DPA. In addition, seed will be provided. Trees will be replaced (two trees for each lost) plus the monetary compensation in accordance with DPA definition.
Appropriate and accessible grievance mechanisms must be established for the affected people and their communities	National legislation does not specifically require the creation of a grievance mechanism for the affected people, although this is common practice and the role of local leaders in process facilitation and dispute resolution is recognized.	Appropriate and accessible grievance mechanisms will be established for the affected people and their communities
Eligibility of Benefits include, the PAP who have formal legal rights to land (including customary and traditional land rights recognized under law), the PAP who don't have formal legal rights to land at the time of census but have a claim to such land or assets and the PAP who have no recognizable legal right to the land they are occupying.	Mozambican law does not specifically states that Tenant have right to any compensation, although this is common practice.	Compensate tenant for types of losses in production/crops and fruit tree
Provide support for the transition period (between displacement and livelihood restoration	There is no provision for other kinds of assistance beyond compensation.	Assistance will be provided specially to the more vulnerable
For projects that entail land acquisition or involuntary resettlement of fewer than 200 people, abbreviated resettlement plan is to be prepared.	Mozambican legislation requires planning instruments, such as resettlement action plans. However it does not differentiate planning instruments according to the scale and characteristics of displacement	Only this SLUCP is prepared since there is no involuntary resettlement is involved for the conduct of even Abbreviated Resettlement action plan (ARAP).
JICA Guidelines	Mozambican Legislation	Adopted Measure in SLUCP



## 4

**DESCRIPTION ON COMPENSATION**

As mention in Section 2.3 of Chapter 2 of residents located within the project area have a formal DUAT title on the occupied land, and the rights of use were established under traditional or communal structures.

The Mozambican legislation states that individual or legal entities may acquire rights for the use and exploitation of land in rural or urban areas by acquiring the necessary permits (DUAT).

On one hand, the right for use and exploitation of land for economic activities is granted for a maximum period of 50 years (renewable for an equal period on request). On the other hand, the right of use and exploitation of land occupied by traditional communities is not limited by any term but it can be revoked for reasons of public interest, upon payment of just compensation.

Although the implementation of project does not generate situations of physical displacement, economic displacement of PAP involving losses of income or means of livelihood will be unavoidable.

**4.1 Eligibility Criteria**

All persons, regardless the type of ownership, occupying, using or doing income generating activities inside the project area on the cut-off date are eligible for compensation. Any encroacher or new settlements within the project impact area after the determined cut-off date will not be eligible for compensation.

In brief, the implementation of the project will result in the following impacts:

- Loss of agricultural land (permanent);
- Loss of cropping areas;
- Loss of fruit trees;

The following categories of project affected persons were considered as eligible for compensation:

- Owners with traditional rights to agricultural land located inside the project site (either substation or access road);
- Tenant of agricultural land located inside the project area;
- Owner of crops located inside the project site area;
- Owner of fruits trees located in the project site;

## **4.2 Entitlement for Compensation**

### **4.2.1 Entitlement for Loss of Agricultural Land**

Agricultural land within the proposed site for the construction of the new substation and access road will be compensated in kind (land for land) including replacement cost.

The replacement land must have at least the same size and productivity potential as the lost land.

The current land should be abandoned immediately after the harvest season, to avoid loss of cultures.

The replacement land should be cleared of trees prior to delivery. The project will cover the cost of clearing and preparation of new fields and affected communities will be involved in the work of clearing and removal of vegetation in new fields, receiving appropriate payment, at market price, for such work.

In addition, seeds should also be given to the owners of the new plots.

The project proponent (EDM) or a subcontracted entity shall be responsible for finding the replacement land and must ensure that it is located within the household community, as close as possible of the current farmland.

### **4.2.2 Entitlement for Loss of Crops**

Monetary compensation will be provided in case of crop loss. The amount of compensation to be awarded will be based on the tables provided for this purpose by the Nampula Provincial Directorate of Agriculture and should never be less than current market prices.

In addition, the project proponent shall provide seeds to the owners of the lost crops.

PAP will be allowed to harvest their crops before construction works begin.

### **4.2.3 Entitlement for Loss of Fruit Trees**

In case of loss of fruit trees located in the area occupied by the household replacement trees will be provided. For each lost tree two replacement trees will be provided.

In addition, monetary compensation will be granted to cover the loss of production from lost mature trees. The amount of compensation to be awarded will be based on the tables provided for the purpose by the

Nampula Provincial Directorate of Agriculture and should never be less than current market prices.

#### 4.2.4 Other Related Assistance

There are vulnerable people among those affected by the project. Given the number of vulnerable persons identified on the socio-economic survey, the entity responsible for the implementation of SLUCP must take additional measures in order to minimize the impact of the project on PAP ensuring that their livelihood does not deteriorate comparing to the pre-project situation.

In order to facilitate payment of compensation it is suggested that EDM in coordination with local authorities, identify PAP with no Identification Documents and/or no bank account and provide the necessary means to assist them in the opening of a bank account.

As such, the following actions must be taken into place:

- Identification PAP with no bank account;
- Ensure that PAP have the necessary documents for an account opening;
- Assist PAP in the obtainment of the documents, if necessary provide transportation.
- Identify and contact the most appropriate bank to open the bank accounts;
- Arrange for a meeting between PAP and the bank for processing the bank account paper;
- Arrange for transportation to and from the meeting site, especially for PAPs.

In addition, during the consultation with PAP and information dissemination stage EDM must advise PAP on the best way of using the compensation payment

Table 17 provides an entitlement matrix for losses incurred by PAP.

Table 17 - Entitlement matrix

Item N°	Type of loss	Entitled Person (Beneficiaries)	Entitlement (compensation Package)	Responsible organization
1	Loss of agricultural land (permanent)	Owners with traditional rights to the agricultural land located inside the project site	Compensation in kind. Replacement land with at least the same size and productivity potential. Assistance in kind: New land preparation, including payment for wages, at market price by employer.	Proponent (EDM) or Subcontracted entity
		Tenant of agricultural land located inside the project site	No compensation for loss of land; Compensation for loss of crops	Proponent (EDM) or Subcontracted entity
2	Loss of cropping areas	Owner of crops located inside the project site	Monetary compensation based on the relevant agriculture crop loss compensation tables as legally determined by the Nampula Provincial Directorate of Agriculture (DPA-Nampula). The compensation tables could be referred to in Annex A of this SLUCP Report. The compensation is based on the current market price and productivity values for various annual and permanent crops. Assistance in kind: Seeds will be provided.	Proponent (EDM) or Subcontracted entity
3	Loss of fruit trees	Owner of fruits trees located in the project site	Monetary compensation based on the relevant fruit tree loss compensation tables provided by the Nampula Provincial Directorate of Agriculture (DPA-Nampula) as referred above. Replacement trees: For each loss trees two trees will be replaced.	Proponent (EDM) or Subcontracted entity

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**RESULT OF CONSULTATION WITH PAP**

Consultation with PAP was initiated during the data collection in July 2014. During the fieldwork, 19 household heads with small farmlands and fruit trees on the project site were surveyed and general expectations regarding the project were gathered. There is a general satisfaction with the implementation of a new project in the Meconta area, particularly if this project is likely to provide tangible benefits to the local communities that will be directly or indirectly affected by the project. Monetary compensations were mentioned by the PAP as one of the most important tangible benefits followed by the creation of employment in the construction and operation of the substation. There is a general sense that if acceptable alternatives were provided by the project proponent, the PAP would easily accept the implementation of the substation and they would be opened for a discussion and agreement on possible relocation and/or compensation.

The consultation for the Reinforcement of Transmission Network in Meconta and the involvement of the PAP had three main objectives: (1) Inform about the proposed project to be implemented in Meconta; (2) Present the results of the simplified environmental study and; (3) Present the results of the simplified land use compensation plan.

The objective 3 with regards to the compensation component, however, was not totally fulfilled due to legal requirements and constraints on the consultation for the compensation process. This is further detailed below:

- 1) As outlined in the SLUCP, the establishment of the proposed project will result in the economic displacement of a number of PAPs. This, on its turn will lead to the cessation/expropriation of asset ownership or use rights among the affected PAPs. The project proponents, are therefore, required by law to compensate for the partial or complete loss of those assets or land access use rights.
- 2) In conformity with the Decree 19/2007 of 18<sup>th</sup> July, the expropriation/compensation process should be carried out following the procedures/steps indicated below:
  - a) The expropriation is always preceded by a public statement issued by the government expressing interest, need or utility area to be expropriated, and stating the reasons that motivate such expropriation.

- b) The expropriation process begins with the notification by the proponent (drafted by the entity that proposed the expropriation) of the intention to expropriate.
- c) The notification should contain:
- ✓ Copy of the declaration that awarded competences for the expropriation. (*please refer to the 3 options in the footnote*)<sup>1</sup>;
  - ✓ Proposals of the terms and compensation calculations per Household (the HH files will contain all relevant information at HH level and a location map of the concerned agriculture plot(s);
  - ✓ Modalities and timelines for payment of the compensations;
  - ✓ Timeline for effective occupation of the expropriated land;
  - ✓ Timeline awarded to the affected parties to contest the terms of the compensation and handover of the assets;
- 3) All of the above, which fall under the responsibility of the proponent, were still lacking definition, during the consultation phase of the project, particularly the public statement issued by the government. In addition, the initiation of the compensation process requires by law, close collaboration and coordination between the proponent, the local authorities and the PAPs. In conclusion, in the absence of a public statement issued by the government and information on communication between the proponent and local government and PAPs, it is not possible to the impact assessment firm, *Impacto Lda - Projectos e Estudos Ambientais*, to conduct the compensation process particularly in terms of acceptable alternatives on means of compensation, areas of small scale agricultural and other land relocation and other aspects.

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o <sup>1</sup> a) Request an approval for the expropriation decree to be issued by the Government, and thereafter the proponent should follow all the procedures regarding the payment of indemnities, and if applicable to the case, the resettlement of populations; b) In the light of the private law, acquire the rights and/or assets present in the designated area (in accordance with the willing seller - willing buyer principle); c) Request, from the entity that authorized the issuing of the title or recognition of the DUAT, a declaration of extinction of rights of use and benefit of land.

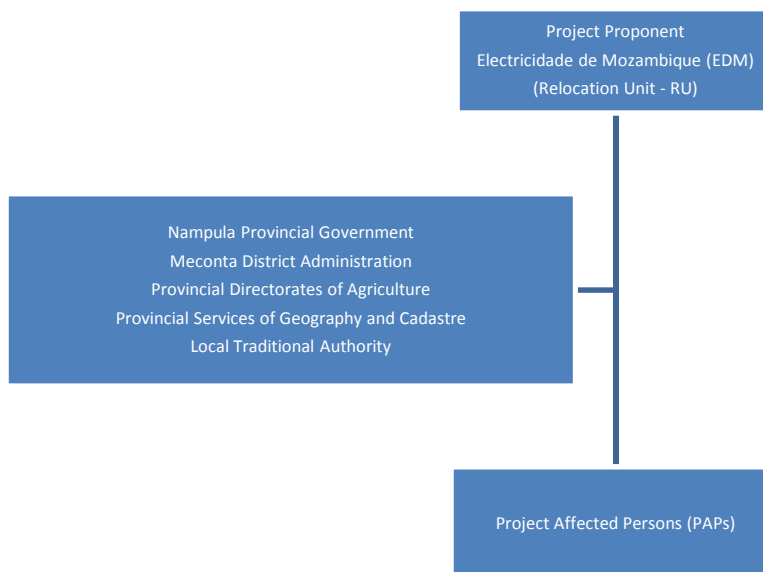
## 6 INSTITUTIONAL AND IMPLEMENTATION FRAMEWORK

### 6.1 Overview

In Mozambique it is common practice that the responsibility for planning and implementing compensation measures lays on the project proponent. However, the State reserves the right to closely monitor the process and, therefore, certain State institutions play an important role.

It is proposed that the implementation of the Simplified Land Use Compensation Plan shall be pursued by a Relocation Unit (RU) to be established by EDM in cooperation with Nampula Provincial Government, Meconta District Administration, Nampula Provincial Directorate of Agriculture, Nampula Provincial Services of Geography and Cadastre as well as with the Traditional Authorities.

In this section, the various players proposed to be involved in the SLUCP implementation process are named and their respective roles defined. The Figure 4 below resumes the SLUCP organization.



**Figure 4 - SLUCP implementation Organization**

### 6.2 Electricidade de Moçambique, E.P. (EDM)

Electricidade de Moçambique (EDM) is the proponent of the project reinforcement of transmission network in the Nacala corridor. As such, EDM shall establish a Relocation Unit (RU), referred to as RU of EDM, with

one relocation unit manager for the 14 months, to fulfil the following responsibilities:

- Management, coordination and supervision of all the SLUCP activities, including, land acquisition and land-use related compensation;
- Maintenance of the SLUP database, ensuring that all persons and assets affected by the project are adequately identified. This includes updating the database with possible new PAP that were not identified during the preparation of the SLUCP;
- In coordination with Provincial Government, District Administrators and Traditional Authorities ensure that PAP are well informed at each stage of the process, including procedures and time frames for displacement and compensation;
- Ensure that PAP are aware of their rights and obligations;
- In coordination with the Provincial Services of Geography and Cadastre and Traditional Authorities, RU of EDM will identify and provide replacement farmland for all PAP. The replacement land must have at least the same size and productivity potential as the lost land.
- Consult Nampula Provincial Services of Geography and Cadastre on the necessary technical procedures on land acquisition, namely for cadastro, demarcation and delimitation of new sites;
- In coordination with the Traditional Authorities, ensure that the new land is located within the household community, as close as possible of the current farmland.
- Coordinate the removal of planted fruit trees and preparation of new farmlands, in close liaison with the PAP, the Local Leaders, and the contractor of RU of EDM.
- Provide new fruit trees and seeds to PAP.
- Ensure necessary funds to fairly compensate the PAP;
- In coordination with the District Administration and Traditional Authorities, obtain PAP ID and bank account number and if necessary assist PAP opening a bank account, when monetary compensation is due;
- Make compensation payments to the PAP through deposits on the PAP bank account and notify PAP;
- Submit copies of payment records to Nampula Provincial Governor, Meconta District Administration, Nampula Provincial Directorate of Agriculture and Traditional Authorities
- Ensure that compensation is received by PAP through a PAP statement;
- Provide support in grievance redress;
- Perform meetings with Nampula Provincial Governor, Meconta District Administration, Nampula Provincial Directorate of



Agriculture, Traditional Authorities and PAP in order to evaluate the SLUP implementation and to ensure livelihood restoration;

### **6.3 Nampula Provincial Government and Meconta District Administration**

Nampula Provincial Government and Meconta District Administration is proposed to be the major players assisting RU of EDM providing the necessary legal and logistical support for the implementation of the SLUCP.

We propose that Meconta District Administration, in its capacity as the lawful authority, will perform the following functions:

- Provide formal channel of communication and goodwill between the community members and RU of EDM;
- Ensure that PAP are well informed through the local authorities, at each stage of the process;
- Ensure that PAP are aware of their rights and obligations;
- Assist RU of EDM on the identification of replacement farmland and awarding of ownership rights;
- Follow up RU of EDM on the removal of planted trees and preparation of new farmlands.
- Follow up monetary compensation payment to PAP;
- Maintain records of PAP and the payment details;
- Receive complaints from PAP and assist PAP accordingly;

In addition, Nampula Provincial Government will mediate in the resolution of disputes and complaints.

### **6.4 Nampula Directorate of Agriculture and Nampula Services of Geography and Cadastro**

Nampula Services of Geography and Cadastro will have the overall responsibility of assisting RU of EDM on the land acquisition technical procedures.

It shall provide RU of EDM the necessary elements to proceed with land acquisition, namely demarcation and delimitation of new sites.

Nampula Directorates of Agriculture will prepare updated list of standard compensation values for annual crops and fruit trees.

### **6.5 Traditional Authorities**

The local Traditional Authorities/Community leadership will establish the linkage between PAP and Meconta District Administration. They will have the overall responsibility of supervising the SLUCP implementation and

report to local authorities any deviation on the project objectives in particular regarding to livelihood restoration.

Thus, it is proposed that local Traditional Authorities/Community leaders will undertake the following tasks:

- Ensure that all persons and assets affected by the project are adequately identified.
- Ensure that PAP are well informed at each stage of the process, including procedures and time frames for displacement and compensation;
- Ensure that PAP are aware of their rights and obligations;
- In coordination with the District Administration provide replacement farmland of same farming potential for PAP.
- Ensure that the new land is located within the household community, as close as possible of the current farmland.
- Assist on the removal of planted fruit trees and preparation of new farmlands, in order to ensure that displacement process is in accordance with the plan.
- Assist PAP in the opening of bank accounts, when monetary compensation is due;
- Submit all PAP complaints to the respective District Administration in accordance with established procedures for grievance redress claims;

## 6.6 Compensation Advisory Committee

The implementing entity, RU of EDM, will set up a Compensation Advisory Committee at the project level to involve the local community in the implementation process.

The Compensation Advisory Committee will be comprised by the following membership:

- RU of EDM representative, as the chair;
- Nampula Provincial Government Representative;
- Meconta District Administration Representative;
- Nampula Provincial Directorate of Agriculture Representative;
- Nampula Provincial Services of Geography and Cadastre Representative;
- Local Traditional Authorities;

The committees will seek local inputs from the affected people and communities in the implementation process and assist the implementing entity in all matters related to displacement.

The Compensation Advisory Committee will ensure local participation in the implementation of the SLUCP and provide support to PAP on grievance resolution.

The Committee will meet monthly, until one month after displacement completion.

## 6.7 Procedures for Grievance Redress Claims

In process involving economic displacement and compensation, it is common that PAPs are not fully satisfied with the solution. Typically grievance will be concerned with asset identification, entitlement to compensation and assessment of the value of assets.

In this sense, appropriated conflict resolution mechanisms will be established in order to ensure that the grievance is well addressed.

By establishing a grievance resolution mechanism it is essential to ensure a channel of communication in which PAP can rely on and where complaints are treated through an accessible and transparent process. Therefore, the procedures for grievance and redress claims will involve the local community and local authorities.

Grievances related to any aspect of the SLUCP will be handled through negotiation aimed at achieving consensus. Complaints will pass through 3 stages before applying to a court of law as a last resort.

In the first instance, grievance should be solved at the local level with the assistance of traditional leaders. Aggrieved PAP can address the complaint in writing or verbally (Annex C). The traditional leaders must resolve the dispute within 7 days.

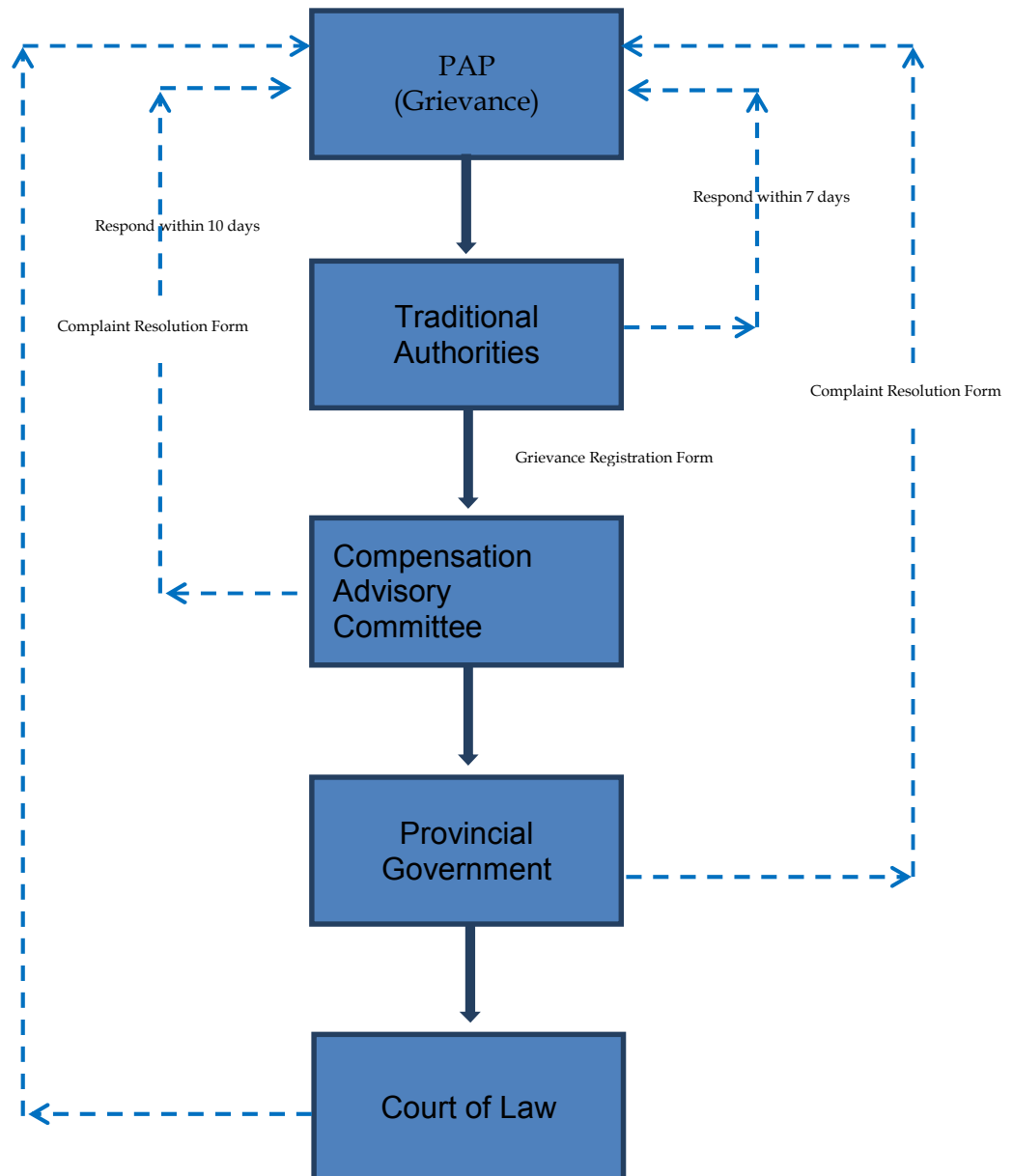
If the aggrieved PAP is not satisfied with the decision taken on the complaint or when disputes cannot be solved at this level, PAP can present the complaint to the Compensation Advisory Committee.

The complaint can be submitted by filling a grievance registration form. A template of grievance registration form is presented on Annex C. If the complainant requires assistance to formalize the writing complaint, either the traditional leaders or RU of EDM must provide it.

The Compensation Advisory Committee will propose a resolution to the grievance and communicate it to the PAP within 10 days after the committee decision. The Compensation Advisory Committee will communicate the resolution to the aggrieved in writing by filling the Complaint Resolution Form (See Annex D).

When conflicts cannot be resolved informally at the Project level, formal mechanisms will be required. The Provincial Government can be referred. Decisions by Provincial Government leaders can be subject to appeals in a Court of Law, where the case will be handled under Mozambican law

RU of EDM must keep record of the entire process, taking note of the grievances presented, the responses to them and the agreements reached. This information must be stored in a file in order to ensure that the process is transparent and accessible. The following chart Figure 5 shows the steps for the grievance redress mechanism:



**Figure 5 - Grievance redress mechanism**

## 7 MONITORING

### 7.1 Overview

Monitoring is a critical tools in order to assess the overall project performance, particularly in regarding to PAP livelihood restoration.

For this purpose, a monitoring system is required to be developed aiming to give feedback to the project management which will help keep the SLUCP on schedule and make it successful. Monitoring provides a working system for effective implementation of the SLUCP and an information channel for the PAP to assess how their needs are being met.

RU of EDM, the implementing entity, shall establish an internal monitoring system for collection, analysis and reporting on SLUCP progress.

In addition, an independent external monitoring agency must be commissioned for monitoring the impact of the SLUCP implementation and periodic evaluation of compensation process and final outcome.

The performance indicators will be listed and monitored by means of the two monitoring mechanisms.

The monitoring and evaluation system must pay considerable attention to vulnerable groups, since they are more susceptible to negative impacts of displacement than the rest of PAP.

The monitoring and evaluation system, including progress report and final reports delivery, is described in the following sections.

The tables presented below shows the monitoring form as well as the indicators that would be presented on the reports, in both internal and external monitoring.

This indicator results from the socio-economic survey evaluation and allows establishing baseline scenarios on which monitoring will relay on.

The monitoring indicators are designed to quantitatively measure the physical and socio-economic status of the PAP and to determine and guide improvement in their social wellbeing.

### 7.2 Entitlement System

The following Table 18 presents the anticipated PAPs issues entitled for compensation.

Table 18 – Anticipated Entitlement for Compensation

Item N°	Type of loss	Entitled Person (Beneficiaries)	Entitlement (compensation Package)	Unit	Number of PAP's affected	Number of households affected	Budget (MZM)
1	Loss of agricultural land (permanent)	Owners with traditional rights to the agricultural land located inside the project site	Assistance in kind: new land preparation, including payment for wages at market price	10 ha	146	17	100,000.00
2	Loss of cropping areas	Owner of crops located inside the project site	Monetary compensation	10 ha	81	9	151,015.00
			Assistance in kind: seeds will be provided	Kg	81	9	3,000.00
3	Loss of fruit trees	Owner of fruits trees located in the project site	Monetary compensation	1708 Trees	140	18	403,500.00
			Replacement trees (duplicate)	2416 Trees	140	18	10,000.00
4	Other	Vulnerable persons	Monetary assistance	-	12	12	20,000.00
5	Relocation Unit	within EDM	Salary for a relocation unit manager, transportation and accommodation costs	-	-		500,000.00
5	Monitoring	External Agency	Payments	-	-		150,000.00
Total					146	-	1337,515.00

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**7.3****Internal Monitoring**

As mentioned in Figure 4 of section 6.1, a Relocation Unit (RU) established by the project proponent EDM (RU of EDM) will conduct, supervise and monitor the implementation of the SLUCP and will report the result of such assessment to JICA on a monthly basis.

Internal monitoring will allow the RU of EDM to measure physical progress against the milestones established in the SLUCP displayed through timetable.

The report will cover the following:

- Degree of SLUCP implementation against milestones established;
- Results obtained, achievement of the SLUCP objectives;
- Main challenges encountered;
- Outcomes/effects of the implemented activities;

Internal monitoring should be proactive. It must confirm whether SLUCP implementation has been carried out in accordance with the planned, identify issues and suggest corrective measures.

In this light, internal monitoring should be focused on the monitoring indicator presented on the template below, Table 19.

**Table 19 - Monitoring Form - Monthly Progress Report for SLUCP (Internal Monitoring)**

N	Monitoring Indicators	Unit	Montly Progress (N°)	Montly Progress (% of the total)	Cumulati ve Achievem ent (N°)	Cumulati ve Achievem ent (% of the total)
<b>1. Displacement Preparation</b>						
1	Identification of PAP	N°				
2	N° of HH signatures for Compensation contracts	N°				
3	N° of HH with bank account	N°				
4	Identification of farmlands	N°				
5	Identification of Fruit Trees	N°				
6	Identification of Crops	N°				
7	N° of Meeting with PAP	N°				
<b>2. Delivery on Compensation</b>						
1	N° of PAP replaced	N°				
2	Size of farmland allocated	Ha				
3	N° of farmland plots allocated	N°				
4	N° of fruit trees replaced	N°				
5	N° of HH that received seeds assistance	N°				
6	N° of HH-VP that received assistance	N°				
7	Amount of Compensation on Land preparation	MZ M				
8	Amount of Compensation on Crops	MZ M				
9	Amount of Compensation on Fruit Trees	MZ M				
10	Amount of Compensation on Seed	MZ M				
11	Amount of assistance to HH-VP	MZ M				
<b>3. Public Consultation</b>						
1	N° of compensation and reallocation meetings	N°				
2	N° of Grievance redress procedures filed	N°				
3	N° of Grievance resolved	N°				

Table 20 lists the public consultation meetings to be held with PAP's, their main concerns and the answers to address PAPs issues. Every new event should be appended to the list.



**Table 20 - Monitoring Format for Public Consultation**

Serial	Date	Place	No. of Participants	Contents of the consultation	
				Main comments	Main answers
1					
2					
3					

#### 7.4 External Monitoring

One month after the displacement completion an external monitoring is to be conducted by an independent agency that shall be commissioned through the standard bidding process. The Terms of Reference of the arrangement with the external monitoring agency shall be prepared by the RU of EDM and shall be submitted to JICA approval as appropriate.

External monitoring will take place at least every three months until the end of the monitoring process.

This agency will be responsible for evaluating the impact of project on the socio-economic status of PAP after the displacement and compensation process, whether they are better or worse regarding livelihoods restoration, especially for vulnerable persons. Thus, external monitoring will focus on the outputs and outcomes of the SLUCP. It shall measure the effectiveness of the SLUCP in meeting the needs of the PAP.

In this sense, external monitoring and evaluation must conduct an on-going comparative analysis with reference to pre and post-project achievement.

In addition to the reviewing on internal monitoring, the external monitoring agency will carry out field visits in order to assess specific issues such as:

- Degree of SLUCP implementation against the planned activities;
- Assessment of the level of satisfaction of PAP in the displacement process overall, including displacement policy, entitlements, compensation payment, support provided and livelihood restoration;
- Participation of PAP in the SLUCP planning, updating and implementation;
- Transparency and access to information under the SLUCP implementation;
- Land acquisition and displacement procedures, including coordination between the SLUCP and construction;
- Implementation of the grievance redress mechanism and effectiveness of resolution;

The external monitoring agency will present quarterly reports summarizing all the above mentioned aspects of SLUCP and monitoring.

The Report will highlight the issues and problems arising and if required, suggest specific mitigation measures.

Table 21 is intended for monitoring and report of the Compensation Plan, on a quarterly basis (three months).

**Table 21 - Activities Monitoring Form (External Monitoring)**

Relocation Activities	Planned Total	Unit	Progress in Quantity			Progress in %		Expected Date of Completion	Responsible Organization
			During the quarter	Till the last quarter	Up to the quarter	Till the last quarter	Up to the quarter		
Preparation of SLUCP									
Employment of Consultants		Man month							
Implementation of Census Survey (Including Socio Economic Survey)									
Approval of SLUCP			Date of Approval						
Finalization of PAPs List		No of PAPs							
Progress of Compensation payment		No of HHs							
Lot 1 (Land)		No of HHs							
Lot 2 (Crop)		No of HHs							
Lot 3 (Trees)		No of HHs							
Lot 4 (Seeds)		No of							

Relocation Activities	Planned Total	Unit	Progress in Quantity			Progress in %		Expected Date of Completion	Responsible Organization
			During the quarter	Till the last quarter	Up to the quarter	Till the last quarter	Up to the quarter		
		HHs							
Lot 5 (VP)		No of HHs							
Progress of Land Acquisition (All Lots)		m <sup>2</sup>							
Progress of Asset Replacement (All lots):		No of HHs							
Lot 1 (Land)		No of HHs							
Lot 2 (Crop)		No of HHs							
Lot 3 (Trees)		No of HHs							
Lot 4 (Seeds)		No of HHs							
Lot 5 (VP)		No of HHs							

If the finding of the external monitoring indicates that the objectives of the SLUCP have not been achieved, the agency will propose appropriate measures to meet the SLUCP objectives. RU of EDM will initiate corrective action, where necessary, based on the recommendations of the agency.

Monitoring of certain indicators are very important for due implementation of involuntary resettlement issues and thus ensuring congenial social environment. As per JICA guidelines it should be at least for a minimum of 2 years period after the last date of completion of all resettlement of households.

It is expected that in this project case with no resettlement of population the proposed minimum timeframe of 10 months covering 2 harvesting seasons is regarded as adequate considering also the small scale nature of the SLUCP compensation in question (only 19 households). A Set of monitoring

indicators is proposed below on a tentative basis for the livelihoods and compensation monitoring, both internal and external. In addition, the monitoring indicators will be reported on monthly, quarterly and annual basis. The reporting will be carried out for the monitoring indicators outlined in Table 22.

**Table 22 - Indicator-wise Monitoring Results during Report Period**

Serial	Monitoring Item/Indicator	Report Period			
		Month-1	Month-2	Month-3	-----
1	Amicable Negotiation (Total 100%) Cumulative progress				
2	Successful grievance resolution (No.) Cumulative progress				
3	Timely delivery of Compensation (in MZM) Cumulative progress				
4	Satisfied with agreed relocation (No. of PAPs) Cumulative progress				
5	Restoration of economic/agricultural activities (No. of PAPs) Cumulative progress				
6	No of occupational disruption and major damages (No. of PAPs) Cumulative Figure				
7	Land prepared for compensation Cumulative Figure				
8	Trees provided for compensation Cumulative Figure				
9	Seed provided to PAPs Cumulative Figure				
10	Enhanced livelihood through effective use of compensation (No. of PAPs) Cumulative progress				
11	Assistance provided to Vulnerable Persons -In MZM -No. PAPs				

## 8 TIMETABLE AND BUDGET

### 8.1 Timetable

Implementation of the SLUCP will begin prior to the constructions works. No construction work will begin until all PAP have been compensated and relocated from the project site. On other hand, relocation will be undertaken after necessary compensation and assistance have been provided.

A total estimated time of 14 month will be required for the implementation of SLUCP. The process of compensation and posterior reallocation will occur within the first 4 months. Additional 10 months will be required for monitoring PAP and ensure that livelihood and income have improved at least to the pre-project standard, by allowing the monitoring to cover at least 2 harvest seasons.

Implementation timetable will commence after the final approval of the Simplified Land Use Compensation Plan by JICA.

The implementation of the SLUCP it is proposed to be pursued by RU of EDM in cooperation with Nampula Provincial Governor, Meconta District Administration, Nampula Provincial Directorate of Agriculture, Nampula Provincial Services of Geography and Cadastre and Traditional Authorities. For this propose a Compensation Advisory Committee will be established. The role of each play is described on chapter 6, institutional and implementation framework.

The following steps must be ensures for the SLUCP implementation:

1. Preliminary meeting with local authorities (Nampula Provincial Governor, Nampula District Administration, Nampula Provincial Directorate of Agriculture, Nampula Provincial Services of Geography and Cadastre and Traditional Authorities) with the propose of presenting the institutional framework and scope of the SLUCP implementation;
2. Establishment of the Compensation Advisory Committee;
3. Update SLUP database, ensuring that all persons and assets affected by the project are adequately identified;
4. Identify replacement farmland for all PAP and submit necessary applications for reallocation land;
5. Consultation with PAP and information dissemination. Inform PAP on the stages of the implementation process and timetable for compensation, displacement and commencement of construction works. PAP must be aware of condition to vacate current farmland. In addition,

- RU of EDM must advise PAP on the best way of using the compensation payment;
6. The procedures for grievance redress must be publish and accessible for all PAP;
  7. Preparation of a list of contractors service provider, including local community (preparation of new farmlands, new fruit trees and seeds);
  8. Procurement for external Monitoring Agency;
  9. Signature of the compensation agreements between EDM and the PAP;
  10. Carry out bank accounts opening for PAP with Bank staff;
  11. Make compensation payments to the PAP through deposits on the PAP bank account and notify PAP. Payment will take place one month after the SLUCP implementation begin;
  12. Provide in kind assistance for new farmland preparation;
  13. Notify PAP that they must vacate the farmland within 30 days after compensation payment;
  14. Provide support in grievance redress. Grievance redress will be an ongoing process. It will last 3 month after displacement;
  15. Perform monthly meetings with Compensation Advisory Committee and PAP in order to evaluate the SLUP implementation and to ensure livelihood restoration. The meetings will ensure that the information about the PAP are current and provide the necessary information for database update;
  16. Internal Monitoring;
  17. External Monitoring (after displacement completion);
  18. Monthly Report;
  19. Final SLUCP Completion Report, including SLUCP draft report;

The overall process of the SLUCP will be implemented following the Gantt chart below in Figure 6.

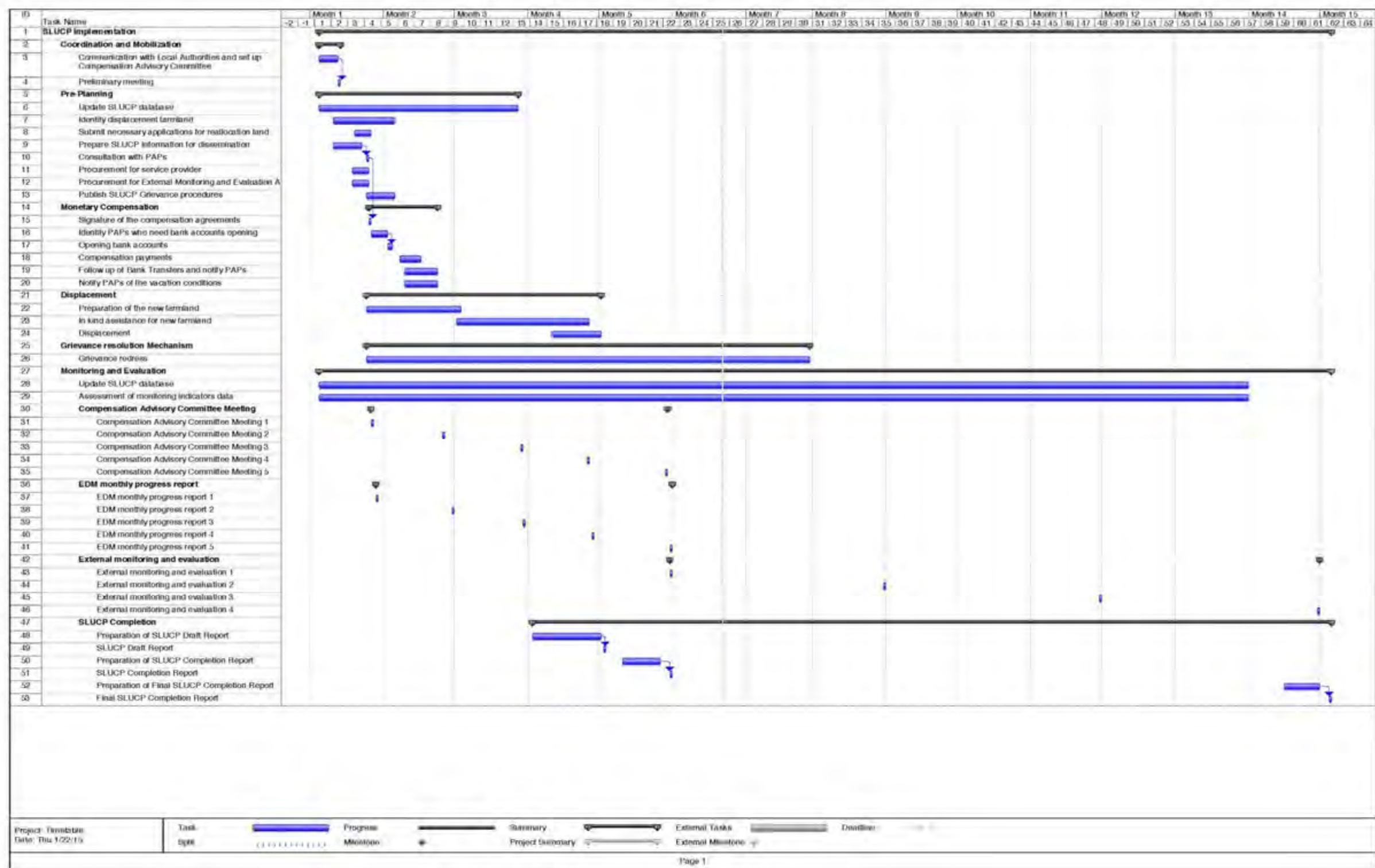


Figure 6 - SLUCP Implementation Schedule by RU of EDM

## 8.2

**Budget**

The total cost for compensating PAP on the assets affected by the project was estimated in chapter 2.5 and is approximately 554,515.00 Mozambican Meticaís. In addition to the compensation value, the implementing entity will incur in others costs, namely:

- Assistance in-kind for new land preparation
- Assistance in-kind by providing seeds;
- Replacement trees;
- Assistance to vulnerable persons;
- Relocation Unit (RU) in EDM (RU of EDM);
- External monitoring agency;

The estimation of those cost were based on the market price of the required items.

Assistance in-kind for new land preparation

As mentioned in Table 11, all the 9.8 hectares of replacement land should be cleared of trees prior to delivery and the cost of clearing and preparation will be covered by the project proponent. For such task the affected communities will be involved in the work of clearing and removal of vegetation in new fields, receiving appropriate payment, at market price. Taking in to account the wage market price, the estimated cost of clearing and removal of vegetation in new fields is approximately 100,000.00 Mozambican Meticaís.

Seeds provision

The estimated cost for the provision of seeds to the owner of the news farmlands is approximately 3,000.00 Mozambican Meticaís.

Replacement of affected trees

In addition to the monetary compensation for the loss of trees, the project proponent will replace the loss of fruit trees located in the new area. For each loss trees two trees will be replaced. The inventory of assets revealed that there are grand total of 1,708 trees located within the project area. The estimated cost of replacing the farmland with new trees is approximately 10,000.00 Mozambican Meticaís.

Assistance to vulnerable persons

RU of EDM will support all cost associated with assistance to vulnerable persons such as transportation, logistics and administration, when required. Additionally, families should be addressed, through a pre-scheduled visit by the local authorities (local chiefs and traditional leaders), to inform thoroughly about the implementation of the project in the area and the implications of the



implementation of the project on their livelihoods; Also a clear explanation shall be provided regarding the expropriation process that will be subject to and the measures that will be employed for compensation; Although, at this point is not possible to predict the total amount necessary, a rough estimation of 20,000.00 Mozambican Meticaís can be suggested.

#### Relocation Unit (RU)

A RU will be established by EDM (Figure 4) as the implementing entity of the SLUCP and its monitoring programme. A relocation unit manager should be hired during the 14 months to fulfil the responsibilities presented in section 6.2. The estimated cost for the hiring of a relocation unit manager with housing and transportation costs is approximately 500,000.00 MZM.

#### External monitoring agency

One month after the displacement completion an external monitoring will take place at least every three months until the end of the monitoring process. The agency will be responsible for evaluating the impact of project on the socio-economic status of PAP after the displacement and compensation process, whether they are better or worse regarding livelihoods restoration. The estimated cost for the bidding process is 150,000.00 MZM.

#### Cost Summary

In order to implement the Simplified Land Use Compensation Plan on the Project for Reinforcement of Transmission Network in the Nacala Corridor a grand total of 1,337,515.00 Mozambican Meticaís will be necessary, Table 23.

**Table 23 - Summary of the estimated cost for the SLUCP (Budget)**

Item	Total Cost (MZM)
Compensation	
Crops	151,015.00
Fruit Trees	403,500.00
Assistance	
Assistance in-kind for new land preparation	100,000.00
Assistance in-kind by providing seeds	3,000.00
Replacement trees	10,000.00
Assistance to vulnerable persons	20,000.00
Relocation Unit	500,000.00
External monitoring agency	150,000.00
<b>Total</b>	<b>1,337,515.00</b>

Source: SLUCP team

**Annex A - Nampula Directorate of Agriculture - Table of prices for food crops for compensation for loss of harvests**

  
 República de Moçambique  
 GOVERNO DA PROVÍNCIA DE NAMPULA  
 DIRECÇÃO PROVINCIAL DE AGRICULTURA

**TABELA DE CUSTOS DE CULTURAS ALIMENTARES E DE RENDIMENTO  
 PARA COMPENSAÇÃO PELA PERDA DE COLHEITAS EM METICAIS**

I. Fruteiras

Plantas	Cada planta nova	Cada planta em reprodução	Planta velha (não produzem e secas)
Cajueiros	1.000,00	1.250,00	500,00
Mangueiras	300,00	400,00	150,00
Bananeiras	150,00	200,00	100,00
Citrinos	500,00	750,00	300,00
Litcheira	1.100,00	1.500,00	700,00
Paqueira	250,00	500,00	200,00
Pereiras/Abacateiras	500,00	750,00	300,00
Papaeira	300,00	600,00	200,00
Coqueiros	1.000,00	1.500,00	500,00
Goiabeiras	500,00	750,00	300,00
Caramboleira	500,00	750,00	300,00
Ateira	300,00	600,00	200,00
Trepadeira	300,00	600,00	200,00
Videira	350,00	750,00	250,00
Pessegueiro	500,00	900,00	400,00
Ananaseiro	25,00	50,00	15,00
Morangueiro*	50,00	100,00	30,00

\* Avaliado o custo por metro quadrado (m<sup>2</sup>)

Direcção Provincial de Agricultura – Nampula - Av. Josina Machel n° 1124, CP n° 42, Tel.: (26) 212974/(26) 213308, Fax: (26) 214177

**1. Vegetais e Oleaginosas**

Colheitas	Por metro quadrado (m <sup>2</sup> )
Arroz	
Milho	20,00
Mapira	25,00
Amendoim	25,00
Gergelim	30,00
Feijões	35,00
Feijão manteiga	30,00
Girassol	25,00
Ricino	35,00
	25,00

**2. Vegetais e legumes**

Colheitas	Por metro quadrado (m <sup>2</sup> )
Repolho, Cenoura, Beringela, Tomate, Quiabo, Abóbora, Cebola, Alho, Pimenta, Couve, Alface, pepino, beterraba, amarantos, espinafre e outras.	50,00

**3. Raízes e Tubérculos**

Colheitas	Cada estaca	Cada estaca
Mandioca	3,00	20,00
Batata doce*	15,00	
Batata reno*	40,00	
Inhames	10,00	15,00

\*Avaliado o custo por metro quadrado (m<sup>2</sup>)

**4. Outras culturas**

Colheitas	Por metro quadrado (m <sup>2</sup> )
Tabaco	15,00
Sisal	50,00
Cana sacarina*	15,00
Algodão	7,50
Eucalipto**	

\*Avaliado o custo por estaca, \*\* Avaliado por planta.

Nampula, 06 de Fevereiro de 2014

REPÚBLICA DE MOÇAMBIQUE  
PROVÍNCIA DA PROVÍNCIA DE NAMPAULA

O DIRECTOR PROVINCIAL

Paulo Daniel D. D. D. D.  
(M.A. em gestão e Desenvolvimento)

Republic of Mozambique  
Nampula Provincial Government  
Provincial Directorate of Agriculture

Table of prices for food crops for compensation for loss of harvests

1. Fruit Trees

Plants	Each New Plant	Each plant at reproductive stage	Old Plant (does not reproduce and dry)
Cashew Tree	1,000.00	1,250.00	500.00
Mango Tree	300.00	400.00	150.00
Banana Tree	150	200.00	100.00
Citrus	500.00	750.00	300.00
Lychee Tree	1,100.00	1,500.00	700.00
Jackfruit Tree	250.00	500.00	200.00
Pear/Avocado Tree	500.00	750.00	300.00
Pawpaw Tree	300.00	600.00	200.00
Coconut Tree	1,000.00	1,500.00	500.00
Guava Tree	500.00	750.00	300.00
Starfruit Tree	500.00	750.00	300.00
Sugar Apple Tree	300.00	600.00	200.00
Climbing Fruit Plants	300.00	600.00	200.00
Vine or Grape Tree	350.00	750.00	250.00
Peach Tree	500.00	900.00	400.00
Pineapple Tree	25.00	50.00	15.00
Strawberry Tree*	50.00	100.00	30.00

\*Cost evaluated per square meter (m<sup>2</sup>)

2. Cereals and Oilseeds

Harvest	Per square meter (m <sup>2</sup> )
Rice	20.00
Maize	25.00
Sorghum	25.00
Peanut	30.00
Sesame	35.00
Beans	20.00
French Beans	25.00
Sunflower	35.00
Castor	25.00

## 2. Vegetables

Harvest	Per square meter (m2)
Cabbage ( <i>brassica oleracea var. Capitata</i> ), carrot, eggplant, tomato, okra, squash, onion, garlic, pepper, cabagge ( <i>brassica carinata</i> ), lettuce, cucumber, beet, african spinach or amaranthus, spinach, other	50.00

## 3. Roots and Tubers

	Root	Tubers
Harvest	Each stack	Each stack
Cassava	5.00	20.00
Sweet Potato*	15.00	
Potato*	40.00	
Yam	10.00	15.00

\*Cost evaluated per square meter (m2)

## 4. Other crops

Harvest	Per square meter (m2)
Tobacco	15.00
Sisal	50.00
Sugar cane*	15.00
Cotton	7.50
Eucalyptus**	missing in original

\*cost evaluated per stack

\*\*cost evaluated per plant

Nampula, 06<sup>th</sup> February 2014

The Provincial Director

Pedro Daniel Dzucule

M.A. in Development Management

**Brief explanation on loss of harvest compensation estimation**

The Ministerial Diploma 181/2010 of 3 of November regulates the process of expropriation for projects declared as being of public interest. The directive contains specific guidelines to the compensation of losses induced by Projects. A basic guide on compensation for permanent and annual crops is provided and updated by the Provincial Directorates of Agriculture.

It covers the current market price and productivity values for various annual and permanent crops. In a telephonic interview with Mr. Joaquim Tomas from the Nampula Directorate of Agriculture, the table of prices for food crops for compensation for loss of harvests has been developed for 2014 by the Provincial Government including people from agriculture, economy, livestock and forests in conjunction with one Government official from the Ministry of Agriculture based in Maputo. The tables are being updated almost every year and this is driven mainly by the development of new projects in the north of Mozambique. It is highly advised to use the table of prices for food crops for compensation for loss of harvest since they are based in the experience and data collected by the government officials from different areas mentioned above and therefore assumed by law, to be the "reference values" to be used in case of compensation or economic resettlement of local communities.

On the table of prices for food crops for compensation for loss of harvests developed for 2014, in point 3, the first value is related to the roots (when the cassava and yam are first planted) and the second value related directly to the tubers (after 6 month of the plantations. Additionally, in point 4, the value for eucalyptus crop is missing. There is no eucalyptus in the area where the project will be implemented, therefore there is no relation to the estimation of costs provided for the project.

## **Annex B - Detailed inventory of asset and its valuation**



HH Code	HH Name	Farmland (ID Code)	Farmland area (m2)	Farmland Status	Crop	N° of Cassava	Crop Price (MZM )	Total Crop Value (MZM )	Type of Fruit Tree	N° of Fruit Trees	Fruit Tree Price	Total Fruit Tree Value (MZM)	Total Valuation	
1	Marquita Emilio		1	1440	Cultivated	Cassava	4	5	20	Banana	169	150	25350	37405
			2	3456	Fallow					Cashew	12	1000	12000	
			3	1240	Fallow									
			4	1558	Fallow									
			5	1085	Fallow									
			6	5135	Fallow									
			7	2550	Fallow									
			8	136	Cultivated	Cassava	7	5	35					
		10	2500	Fallow										
		<b>Sub-Total</b>	<b>9</b>	<b>19100</b>				<b>55</b>				<b>37350</b>		
2	Maria Seleque Muquiquire		9A	5900	Fallow					Cashew	2	1000	2000	2315
			9B	713	Fallow									
			9C	3900	Cultivated	Cassava	43	5	215					
			9D	2655	Cultivated	Cassava	20	5	100					
		<b>Sub-Total</b>	<b>4</b>	<b>13168</b>			<b>63</b>		<b>315</b>				<b>2000</b>	
3	Alexandre Puompuela		12	0	Fallow					Cashew	1	1000	1000	2800
			15	940	Fallow					Mango	6	300	1800	
			16	940	Fallow									
		<b>Sub-Total</b>	<b>3</b>	<b>1880</b>									<b>2800</b>	

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HH Code	HH Name	Farmland (ID Code)		Farmland area (m2)	Farmland Status	Crop	N° of Cassava	Crop Price (MZM)	Total Crop Value (MZM)	Type of Fruit Tree	N° of Fruit Trees	Fruit Tree Price	Total Fruit Tree Value (MZM)	Total Valuation
4	Rafael Chahano		13A	8500	Fallow					Banana	1	150	150	7150
			13B	15	Fallow					Cashew	7	1000	7000	
			17	2948	Fallow									
		<b>Sub-Total</b>	<b>3</b>	<b>11463</b>									<b>7150</b>	
5	José Chico		14	0	Fallow					Cashew	6	1000	6000	6000
		<b>Sub-Total</b>	<b>14</b>										<b>6000</b>	
6	Agostinho Muquamoa		18	575	Cultivated	Cassava	8	5	40	Banana	51	150	7650	44690
										Cashew	37	1000	37000	
		<b>Sub-Total</b>	<b>1</b>	<b>575</b>			<b>8</b>		<b>40</b>				<b>44650</b>	
7	Fatima Ernesto		19	750	Cultivated	Cassava	54	5	270	Cashew	17	1000	17000	17855
			20	2356	Cultivated	Cassava	27	5	135	Banana	3	150	450	
		<b>Sub-Total</b>	<b>2</b>	<b>3106</b>			<b>81</b>		<b>405</b>				<b>17450</b>	
8	Amade sabonete		21A	525	Fallow					Cashew	10	1000	10000	10000
			21B	1050	Fallow									
		<b>Sub-Total</b>	<b>2</b>	<b>1575</b>									<b>10000</b>	
9	Julieta Manuel		22	15000	Fallow					Banana	357	150	53550	92550
										Cashew	39	1000	39000	
		<b>Sub-Total</b>	<b>1</b>	<b>15000</b>									<b>92550</b>	
10	Mauricio dos Santos Rosario		23	329	Fallow									0
		<b>Sub-Total</b>	<b>1</b>	<b>329</b>										
11	Arira Momade		24	0	Fallow					Cashew	6	1000	6000	6000
		<b>Sub-Total</b>	<b>1</b>	<b>0</b>									<b>6000</b>	

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HH Code	HH Name	Farmland (ID Code)	Farmland area (m2)	Farmland Status	Crop	N° of Cassava	Crop Price (MZM)	Total Crop Value (MZM)	Type of Fruit Tree	N° of Fruit Trees	Fruit Tree Price	Total Fruit Tree Value (MZM)	Total Valuation	
12	Francisco Horta		25	1325	Cultivated	Cassava	25	5	125	Cashew	4	1000	4000	4625
										Pear	1	500	500	
		<b>Sub-Total</b>	<b>1</b>	<b>1325</b>					<b>125</b>				<b>4500</b>	
13	Cardoso Manuel Manhaca		27	3975	Fallow					Mango	19	300	5700	5700
		<b>Sub-Total</b>	<b>1</b>	<b>3975</b>									<b>5700</b>	
14	Rosario Vasco		26	1875	Cultivated	Beans		20	37500	Banana	416	150	62400	37500
										Cashew	5	1000	5000	
										Mango	2	300	600	
										Guava	4	500	2000	
		<b>Sub-Total</b>	<b>1</b>	<b>1875</b>					<b>37500</b>				<b>70000</b>	
15	Fatima João (Tenant)		27	1875	Cultivated	Beans		20	37500	Banana	97	150	14550	52050
		<b>Sub-Total</b>	<b>1</b>	<b>1875</b>					<b>37500</b>				<b>14550</b>	
16	Arminda Rafael (Tenant)		28	3750	Cultivated	Beans		20	75000	Banana	153	150	22950	104250
										Cashew	3	1000	3000	
										Mango	10	300	3000	
										Papaya	1	300	300	
		<b>Sub-Total</b>	<b>1</b>	<b>3750</b>					<b>75000</b>				<b>29250</b>	
17	João Martins Alberto		29	9000	Fallow					Cashew	6	1000	6000	6600
										Mango	2	300	600	
		<b>Sub-Total</b>	<b>1</b>	<b>9000</b>									<b>6600</b>	

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HH Code	HH Name	Farmland (ID Code)	Farmland area (m2)	Farmland Status	Crop	N° of Cassava	Crop Price (MZM)	Total Crop Value (MZM)	Type of Fruit Tree	N° of Fruit Trees	Fruit Tree Price	Total Fruit Tree Value (MZM)	Total Valuation	
18	Fernando Selemane		30	675	Fallow				Banana	247	150	37050	38350	
									Cashew	1	1000	1000		
									Mango	1	300	300		
		<b>Sub-Total</b>	<b>1</b>	<b>675</b>								<b>38350</b>		<b>38350</b>
19	Elisa Megila		31	9000	Cultivated	Cassava	15	5	75	Banana	4	150	600	8675
									Cashew	8	1000	8000		
		<b>Sub-Total</b>	<b>1</b>	<b>9000</b>			<b>15</b>		<b>75</b>			<b>8600</b>	<b>8675</b>	
		<b>Total</b>		<b>97 671</b>					<b>151 015</b>				<b>403 500</b>	

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## **Annex C - Grievance registration form**

Registration Form for Complaints			
Complaint Nr. ( to be filled by Supervisor)		Date	
Complainant name		Locality/Area	
Number of the Complainant		Census registration number (if applicable)	
Complainant phone number		Complaint recorded by (name and title):	
<b>Detailed Description of the Complaint</b>			
<b>Photographs and / or supporting documents (insert reference and attach a copy)</b>			

## **Annex D - Complaint Resolution Form**

<b>Complaint Resolution Form</b>			
Complaint ref.		Complaint reception date	
Complainant name		Locality/Area	
Number of the Complaint		Census registration number (if applicable)	
Complainant phone number		Complaint redressed by	
<b>Description of the complaint redress</b>			
<b>Acceptance of the redress by complainant</b>			
I _____, declare that my complaint was handled in a timely and effective manner, and I declare that I agree with the resolution measure proposed and implemented.			
Complainant name:			
Complainant Signature (or fingerprint) :			
Official name:			
Official name:			
Witness name:			
Witness signature:			
Photographs and / or supporting documents (insert reference and attach a copy)			