REPORT

Central Térmica de Temane Project - Social Impact Assessment

Moz Power Invest, S.A. and Sasol New Energy Holdings (Pty) Ltd

Submitted to:

Ministry of Land, Environment and Rural Development (MITADER)

Submitted by:

Golder Associados Moçambique Limitada

6th Floor, Millenium Park Building, Vlademir Lenine Avenue No 174

Maputo, Moçambique

+258 21 301 292

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Executive Summary

This document presents the socio-economic implications associated with the proposed *Central Térmica de Temane* (CTT) project. In order to address the growing electricity demand faced by Mozambique and to improve power quality, grid stability and flexibility in the system, Moz Power Invest, S.A. (MPI), a company to be incorporated under the laws of Mozambique and Sasol New Energy Holdings (Pty) Ltd (SNE) in a joint development agreement is proposing the construction and operation of a gas to power facility, known as the CTT project. MPI's shareholding will be composed of EDM and Temane Energy Consortium (Pty) Ltd (TEC). The joint development partners of MPI and SNE will hereafter be referred to as the Proponent. The Proponent proposes to develop the CTT, a 450MW natural gas-fired power plant.

It is anticipated that the proposed project will have socio-economic implications for the receiving environment. To understand the socio-economic conditions within the project area, Golder conducted a baseline study in 2014 during the first phase of the Environmental and Social Impact Assessment (ESIA) (scoping and baseline data collection), and this baseline study was updated in 2018 using a mixed research methodology *viz.,* both qualitative and quantitative research methods were used. According to the findings of the baseline study, communities in the receiving environment are exposed to high rates of unemployment and generally do not have access to adequate social services and infrastructure. Based on the collected data and expert knowledge, impacts were identified and categorised according to the project phase in which the impacts are likely to occur viz., construction, operation and decommissioning phase.

- The construction phase impacts include:
  - Three positive impacts, namely employment opportunities and increased economic revenue and improved infrastructure; and
  - Seven negative impacts, namely loss of land, physical and economic displacement, temporary disturbance of fishing activities, a population influx, exposure to gender-based violence and sexual exploitation and abuse, inflation and the risk to community health and safety.
- The operational phase impacts include:
  - Three positive impacts, namely employment opportunities, electricity supply and community development; and
  - Two negative impacts, namely the loss of employment and the risk of sustained gender-based violence and sexual exploitation and abuse.
- The decommissioning phase impacts include:
  - Five negative impacts, namely loss of employment, reduced economic development, reduced electricity supply, reduced community investment, the risk of family abandonment.

From these impacts, only one construction phase impact (physical and economic displacement) has been rated as a high negative significance impact. Other impacts during the construction, operation and decommissioning phases have been rated as moderate negative and low to moderate positive significant impacts, respectively. If mitigation measures are implemented accordingly, it is anticipated that the consequence and probability of moderate and high negative impacts will be reduced, while moderate positive impacts will on average be enhanced to maximise benefits to the directly affected communities. The social risks identified by Golder for the proposed project include community expectations, Social unrest and community opposition and risks associated with physical and economic displacement, Golder recommends an on-going stakeholder engagement process to manage these social risks.

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ACRONYMS

Acronym	Description
ARLRP	Abbreviated Resettlement and Livelihoods Restoration Plan
ADI	Areas of Direct Influence
ARI	Acute respiratory infection
CCGT	Combined Cycle Gas Turbine
CHSS	Community Health, Safety and Security Plan
CLO	Community Liaison Officer
CPF	Central Processing Facility
CSI	Corporate Social Investment
CSR	Corporate Social Responsibility
CTT	Central Térmica de Temane
DALY	Disability Adjusted Life Year
DUAT	*Direito de Uso e A*proveitamento *dos Terras*
EDM	*Electricidade de Mozambique*
EIA	Environmental impact assessment
ESMP	Environmental and Social Management Plan
ESHIA	Environmental, Social and Health Impact Assessment
ESIA	Environmental and Social Impact Assessment
FGD	Focus Group Discussion
GBV	Gender-Based Violence
GoM	Government of Mozambique
HR	Human Resources
IBA	Important Bird Area
IFC	International finance corporation
KULA	Estudos e Pesquisas Aplicadas, Lda
LDAs	Local Development Agreements

Acronym	Description
LPG	Liquefied Petroleum Gas
MPI	Moz Power Invest, S.A.
NGO	Non-Governmental Organisation
OCGE	Open Cycle Gas Engines
PS	Performance Standard
PZZ	Partial Protection Zone
SAE	Sexual Abuse and Exploitation
SIA	Social Impact Assessment
SNE	Sasol New Energy Holdings (Pty) Ltd
SEPI	Sasol Exploration Production International
SSA	Sub-Saharan Africa
TEC	Temane Energy Consortium (Pty) Ltd.
TTP	Temane Transmission Project
WB OP	World Bank Operational Procedure
WHO	The World Health Organisation

1.0 INTRODUCTION

The Mozambican economy is one of the fastest growing economies on the African continent with electricity demand increasing by approximately 6-8% annually. In order to address the growing electricity demand faced by Mozambique and to improve power quality, grid stability and flexibility in the system, Moz Power Invest, S.A. (MPI), a company to be incorporated under the laws of Mozambique and Sasol New Energy Holdings (Pty) Ltd (SNE) in a joint development agreement, is proposing the construction and operation of a gas to power facility, known as the Central Térmica de Temane (CTT) project. MPI's shareholding will be comprised of EDM and Temane Energy Consortium (Pty) Ltd (TEC). The joint development partners of MPI and SNE will hereafter be referred to as the Proponent. The Proponent proposes to develop the CTT, a 450MW natural gas-fired power plant. It is anticipated that the proposed project will have socio-economic impacts on the receiving environment. Golder has undertaken this Social Impact Assessment (SIA) for the proposed CTT project., this SIA aims to capture the socio-economic baseline of the receiving environment and identify potential impacts associated with the proposed CTT project and identify corresponding management and monitoring initiatives which will form part of the Environmental and Social Management Plan (ESMP) of the proposed CTT project. The following sections provide an overview of the proposed project and the legal framework that applies to the SIA.

1.1 Project overview

This section provides a summary of the CTT project location and the proposed project infrastructure and activities. The detailed project description is provided in the main Environmental and Social Impact Assessment (ESIA) report.

1.1.1 Project location

The project study area is situated in the District of Inhassoro in Inhambane Province in southern Mozambique (Figure 1). The Inhassoro District is in the northern part of the Inhambane Province, between latitudes 10°33' north and 30°51' south and longitudes 40°35' east and 30°41' west. It is 6 329.5 km² in size, of which 6 299 km² is on the continent and 30.5 km² insular, subdivided into 28 km² of Bazaruto Island and 2.5 km² of Santa Carolina Island. The district is bordered to the north by Govuro District, to the south by the Districts of Vilanculos and Funhalouro, to the East by the Indian Ocean and to the West by the Districts of Massinga and Mabote. The district is crossed by the Govuro River. In terms of geographical and administrative division, Inhassoro has two administrative posts (Table 1), which are the Administrative Post of Bazaruto and the Administrative Post of Inhassoro, the latter being the most populated. Table 1 provides an understanding of the administrative posts in Inhassoro District and the number of villages within each locality.

Of the 45 villages across the two administrative posts in Table 1, the proposed CTT project could affect 12 villages and communities, namely: Temane, Mangungumete, Manusse, Chitsotso, Mabime, Mapanzene, Chipongo, Maimelane, Mangarelane, Litlau, Munavalate and Pambara. The proposed beach landing sites may also affect certain businesses and fishing activities in Inhassoro Town.

Table 1: Administrative Division of Inhassoro District

Administrative Post	Localities	Number of Villages
Administrative Post of Inhassoro Town	Inhassoro Town	12
	Maimelane	22
	Nhapele	03
	Cometela	05
Administrative Post of Bazaruto	Bazaruto	03

Administrative Post	Localities	Number of Villages
Total		**45**

Source: Strategic Plan for District Development – PEDD (2011/2015) (2010)

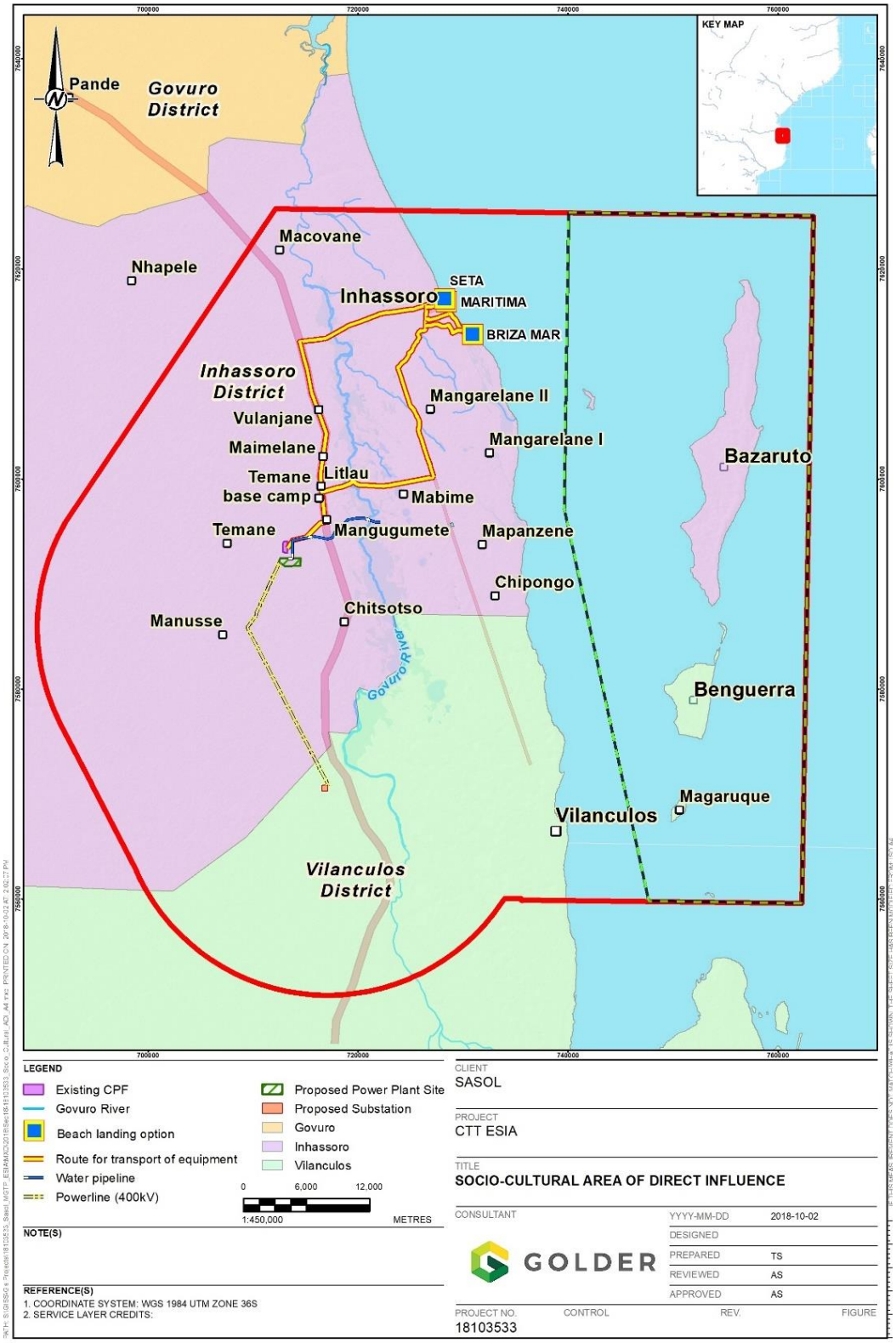

Figure 1: Project location and study area

1.1.2 Project activities

The proposed project will draw gas from the Sasol Exploration Production International (SEPI) Temane gas well field via the existing Central Processing Facility (CPF). Associated infrastructure for the CTT project will include:

- An electricity transmission line (400 KV) and servitude; from the proposed power plant footprint to the proposed Vilanculos substation over a total length of 25 km running southwest from the CTT to a future Vilanculos substation. [Note: the development of the substation falls outside the battery limits of the project scope as it is part of an independent infrastructure authorised separately (although separately authorised, the transmission line will be covered by the Project ESMP, and the Vilanculos substation is covered under the Temane Transmission Project (TTP) Environmental and social management plans). The environmental authorisation for this substation was obtained under the STE/CESUL project. (MICOA Ref: 75/MICOA/12 of 22nd May 2012)].
- Water supply from one or more boreholes located on site or east of the Govuro River that will supply water to the CTT (the latter option will require a pipeline of 11km in length).
- Access road; over a total length of 3 km, which will follow the proposed water pipeline to the northeast of the CTT to connect to the existing Temane CPF access.
- Gas pipeline and servitude; over a total length of 2 km, which will start from the CPF high-pressure compressor and run south on the western side of the CTT to connect to the power station.
- Additional nominal widening of the servitude for vehicle turning points at points to be identified along these linear servitudes.
- Temporary beach landing site and associated camp and laydown area for safe handling and delivery of large heavy equipment and infrastructure to build the CTT. The transhipment consists of a vessel anchoring for only approximately 1-2 days with periods of up to 3-4 months between shipments over a maximum 15 month period early in the construction phase, in order to offload heavy materials to a barge for beach landing. The SETA site is the preferred beach landing site. However, all options are being evaluated through the ESIA.
- A construction camp and contractor laydown area will be established adjacent to the CTT plant site.
- Temporary bridges and access roads or upgrading and reinforcement of existing bridges and roads across sections of the Govuro River where existing bridges are not able to bear the weight of the equipment loads that need to be transported from the beach landing site to the CTT site. Some new sections of road may need to be developed where existing roads are inaccessible or inadequate to allow for the safe transport of equipment to the CTT site. The northern transport route via R241 and EN1 is considered as the preferred transport route (construction phase only) on terrestrial impacts; however, until the final anchor point is selected, and the barge route confirmed, the marine factors may still have an impact on which is deemed the overall preferable route.

1.1.3 Employment

Employment opportunities will be available during the construction and operation phase for both migrants and local people (Table 2). Local recruitment will be facilitated by the establishment of a Community Liaison Forum.

Table 2: Approximate Employment for CTT

Project phase	Available vacancies
Construction	CCGT Option – approximately **850** employees OCGE Option – approximately **690** employees

Project phase	Available vacancies
Operation	CCGT and OCGE Options – approximately **70** employees

The CTT will only recruit skilled migrants if skills are not able to be sourced locally. Workers will be sourced locally as far as possible.

It is envisaged that the construction phase split between local and expatriate employment will be a ratio of approximately 90% to 10% respectively. The estimated worker skills breakdown during the construction phase is as follows:

- Unskilled, local general workers: 60%.
- Local Semi-skilled: 20%.
- Local Skilled: 10%.
- Expat Skilled: 10%.

The operational phase workforce will be split between locals and expatriates, and it is envisaged that the expat employee portion will not exceed 10%. It may be required that there be an initial period of training and transfer of skills in the first two to three years before there is a hand over from an expat to a local employee as part of a skills transfer programme to achieve this target.

2.0 LEGAL FRAMEWORK

2.1 Mozambique regulatory requirements

2.1.1 Environmental law/regulations

The Environment Act (Law 20/1997 of 1 October) specifies that all public and private activities an Environmental Impact Assessment (EIA), with the potential to influence the environment, must be preceded by to obtaining an Environmental Licence. This Law is based on the precautionary principle that focuses on preventing the occurrence of significant or irreversible negative environmental or social impacts, regardless of the existence of scientific certainty about the occurrence of such impacts on the environment. The EIA process is regulated by Decree 56/2010 as well as the requirements in the general EIA regulations published under Decree 45/2004 as amended in Decree 42/2008 and by the Ministerial Decree 129/2006 and Decree 130/2006 which sets out principles for the compilation of ESIA studies and public participation process during the ESIA process.

The Socio Impact Assessment falls within the Environmental Framework Law under specific clauses (article 10, 2) which state the need to perform a “socio-economic description of the [affected] location,” “identification and evaluation of the activity’s fatal issues” and “indication of the activity’s potential environmental impacts”.

2.1.2 Corporate social responsibility

In 2014, the GoM promulgated the “Corporate Social Responsibility (CSR) Policy for the Mineral Resources Extractive Industry” (GoM, 2014). This policy applies to companies operating in the oil and gas sector in Mozambique. The policy aims, among others, to establish guidelines for the extractive industry on poverty reduction. The client is committed to adhering to the CSR policy as promulgated by the GoM through ensuring the following key aspects:

- Communities’ views are considered in the decision-making processes;

- Communities' participation in decision-making for closure regarding environmental restoration, land backfilling, social reintegration of the workforce; as well as harmonisation between restoration programmes and LDA; and
- Defining and establishing how social investment will be made locally by the client. Consequently, the client shall develop and put in place its internal CSR policy.

2.1.3 Regulations on the Resettlement Process resulting from Economic Activities (Decree 31/2012 of 8 August)

This new regulation establishes the basic rules and principles of the resettlement process to provide the opportunity to improve the quality of life of affected households. Article four lists the principles guiding the resettlement process resulting from public and private activities. These include principles of social cohesion; social equality; direct benefit; social equity; non-change of income level; public participation; environmental accountability and social responsibility.

2.1.4 Land law/regulations

A number of policies and legislation govern land matters in Mozambique. These include the Constitution of the Republic of Mozambique (2004), the National Land Policy (Resolution 10/1995 of 17 October), the Land Law (Law 19/1997 of 1 October) and the Land Law Regulations[1] (Decree 66/1998 of 8 December) with its Technical Annex. The Constitution establishes that, among other things, land in Mozambique is the property of the state, that it may not be sold, mortgaged or otherwise alienated and that the state confers the right to use and benefit from land, and the conditions for such. The land use right conferred by the state through the Land Law is known as a "right to use and benefit from land".

The Land Law recognises the legitimacy of customary law. People who occupy and use land in rural areas, individually or as part of a community[2] and following customary norms and practices, such as an inheritance from their ancestors, are deemed to have legal rights to use and occupy the land in question (Article 12). This constitutes a right to use and benefit from the land through "occupation". They may apply for an official title to the land (Article 13), but the lack of registration or title does not prejudice their land rights.

In Mozambique, the principles and procedures for compensation (including physical relocation) are often drawn up and agreed to among the main stakeholders on a case by case or individual project basis. In recent years, it has generally been accepted that where people are displaced from land the principles of fairness and good practice, as elaborated in the policies and guidelines of the World Bank or European Union, for instance, are applied to compensation and relocation.

There is no specific policy or legislation in Mozambique which states the form in which compensation should be provided for the loss of land and assets. Similarly, there is also no definition of the method by which the value of compensation should be determined. Specific laws, regulations and decrees govern certain activities that are related to the resettlement of people. These include the:

- Physical planning of new resettlement villages.
- Possible assessment of environmental impacts and development of mitigation measures in respect of resettlement activities (the environmental law, Law 20/1997 of 1 October and the environmental impact regulations, Decree 45/2004 of 29 September).

[1] *The Land Regulations apply only to land matters in rural areas.*
[2] *The Land Law has its own specific definition for a local community. This is "a grouping of families and individuals living in a territorial area equal or inferior to a locality, with the aim of safeguarding common interests through the protection of residential and agricultural areas (be they in use or fallow), forests, places of cultural importance, grazing lands, water resources and expansion areas".*

- Approval of architectural plans for houses and other structures.
- Relocation of graves.
- Securing the improvement of land tenure security for resettled communities and host communities after relocation (the Land Law and Land Law Regulations).

2.1.5 Law on spatial planning (Law 19/2007) and directive on expropriation process for spatial planning purposes (Ministerial Statute 181/2010)

This law provides for the definition and calculation of fair compensation and provides guidance in situations where citizens' rights are affected through expropriation or Rights of Way. The law provides for compensation of loss of tangible and intangible goods, breakdown of social cohesion and loss of production goods. Regulations require fair compensation to be paid before the transfer of property or expropriation.

2.2 World Bank Performance Standards

World Bank Performance Standards (OP 4.03), has been considered and incorporated throughout this assessment. The main standards applicable to this SIA study are:

2.2.1 PS 1: Social and environmental assessment and management systems

The objectives of IFC PS 1 are to:

- Identify and assess social and environmental risks and impacts, both adverse and beneficial, in the project's area of influence.
- Avoid, or where avoidance is not possible, minimise, mitigate, or compensate for adverse impacts on workers, affected communities, and the environment.
- Ensure that affected communities are appropriately engaged on issues that could potentially affect them.
- Promote improved social and environmental performance of companies through the effective use of management systems.
- Ensure that grievances from affected communities and external communications from other stakeholders are responded to and managed appropriately.
- To promote and provide means for adequate engagement with affected communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.

2.2.2 PS 2: Labour and working conditions

Before the commencement of the project, a Social Labour Plan for the proposed CTT project will be developed. The plan will be aimed at:

- promoting the fair treatment, non-discrimination, and equal opportunity of workers;
- establishing, maintaining, and improving the worker-management relationship;
- promoting compliance with national employment and labour laws;
- protecting workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain;
- promoting safe and healthy working conditions, and the health of workers; and
- avoiding the use of forced labour.

2.2.3 PS 4: Community health, safety and security

The objectives of PS 4 are:

- To anticipate and avoid adverse impacts on the health and safety of the affected community during the project life from both routine and non-routine circumstances.
- To ensure that the safeguarding of personnel and property is carried out per relevant human rights principles and in a manner that avoids or minimises risks to the affected communities.

2.2.4 PS 5: Land acquisition and involuntary resettlement

The objectives of PS 5 are to:

- To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs.
- Avoid forced eviction.
- Mitigate adverse impacts by providing compensation, appropriate disclosure of information, consultation, and the informed participation of those affected.
- Improve or at least restore livelihoods, standards of living.
- Improve living conditions among displaced persons.

2.2.5 PS 6: Biodiversity conservation and sustainable management of living natural resources

The project effects on biodiversity and natural resources management and utilisation are contained in the ecosystem goods and services study and findings presented in the ESIA report.

2.2.6 PS 7: Indigenous people

No indigenous people were identified within the study area during the SIA.

2.2.7 PS 8: Cultural heritage

The objectives of PS 8 are:

- To Protect cultural heritage from the adverse impacts of the project activities and support its preservation by Identifying and reducing or avoiding adverse impacts on cultural heritage resources.
- Ensure the participation of affected communities in the identification of, and potential mitigation of cultural heritage resources, recommending appropriate strategies for impact reduction and long-term cultural heritage management.

2.2.8 PS 10: Stakeholder Engagement and information disclosure

The objectives of PS 10 are:

- To establish a systematic approach to stakeholder engagement that will help borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular, project-affected parties.
- To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be considered in project design and environmental and social performance.
- To promote and provide a means for effective and inclusive engagement with project-affected parties throughout the project life -cycle on issues that could potentially affect them.

- To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.
- To provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow Borrowers to respond to and manage such grievances.

3.0 SCOPE OF STUDY AND METHODOLOGY

3.1 Objectives

The main objective of this study was to undertake an SIA for the proposed CTT project by determining the socio-economic conditions of the project-affected communities and identifying the nature and extent of the potential social implications arising from the proposed CTT project. The specific objectives were to:

- Gain an understanding of the socio-economic conditions within the study area.
- Identify the potential socio-economic impacts that could result from the proposed project.
- Recommend appropriate mitigation measures to reduce and, if possible, avoid negative impacts, while enhancing positive impacts.

For purposes of clarity, the study area for the SIA is shown in Figure 1 and includes communities that are potentially directed impacted by the CTT project and its activities.

3.2 2014 Data collection

Data informing the socio-economic baseline of the project-affected communities was collected in 2014 using a mixed research methodology viz., both qualitative and quantitative research methods were used. The activities undertaken in 2014 to inform the scope of the study are highlighted in the next sections.

3.2.1 Stakeholder analysis

Before data collection, project-affected stakeholders were identified. Stakeholders are defined as persons, groups, or communities external to the core operations of a project who may be:

- Affected by the project:
  - positively or negatively;
  - directly or indirectly, particularly those directly and adversely affected by project activities;
  - particularly if they may be disadvantaged or vulnerable; and
  - may be able to influence the outcome of the project because of their knowledge about the affected communities or political influence over them.
- Those with an interest in the project.

The following steps were followed to identify the local primary and secondary-level stakeholders impacted by the Proponent:

i. **Identification:** Stakeholders were identified using data captured in reports generated in the area by various proponents, undertaking stakeholder mapping exercises, by method of referral, consultation meetings and internet research.

ii. **Assessment:** A second step was to assess the Proponent's impacts on these key stakeholders as well as their impacts on CTT and its operations. Prioritising these key stakeholder groups will create a focused approach towards engagement and will ensure that Proponent's resources are optimally utilised (see Table 2).

iii. **Mapping:** These stakeholders have been geographically mapped around CTTs operations

In order to understand the socio-economic conditions of the receiving environment and implications of the proposed CTT project, primary stakeholders (locally affected people) were consulted in the 2014 survey. Additionally, primarily affected stakeholders participate in the 2014 and 2018 key informant interviews and focus group discussions.

3.2.2 Desktop review

Golder reviewed available documents to gain an understanding of the project, socio-economic conditions of the project area and previous studies conducted in the area. The documents reviewed included the following:

- 2014 ESHIA study;
- 2013 District Government Performance plan;
- 2010 social and demographic profiling of the Temane and Mangungumete communities by KULA; and
- 2009 Inhassoro Development field EIA by ERM and Consultec.

3.2.3 Fieldwork

3.2.3.1 Survey

Golder conducted a survey using questionnaires from 24 February to 2 March 2014. The questionnaire was administered to 10 communities (Table 3).

Table 3: Household survey sample size

Community	Sample size
Temane	33
Mangugumete	34
Chitsotso	34
Manusse	33
Mabime	33
Chipongo	34
Mangarelane	32
Mapanzene	33
Maimelane	34
Litlau	34
TOTAL	**334**

3.2.3.2 Key informant interviews

In 2014, Key informant interviews were conducted with people who, because of their position in the community, can provide valuable data on the potential impacts of a proposed project on their livelihoods and situation. The following key informant interviews were conducted:

- Inhassoro District Permanent Secretary;
- Head of District Services for Health, Women and Social Action;
- Inhassoro District Chief Doctor; and
- Ten community leaders of the covered area.

3.2.3.3 Focus group discussions

In 2014, focus group discussions (FGD) of 10 to 15 people, consisting of a mixture of men and women, were conducted in the affected villages with the permission and coordination of the community leaders. A FGD was also held in Mapanzene and FGDs were also held after the public meetings in Inhassoro and Inhambane during the first round of public participation, as follows:

- Inhassoro:
  - District and local government; and
  - Tourism, NGOs and conservation bodies.
- Inhambane:
  - Provincial and district government; and
  - Tourism bodies and NGOs.

Figure 2: A focus group discussion at Chipongo village during 2014 data collection

3.3 2018 socio-economic baseline update

3.3.1 Desktop review

Golder reviewed the following documents:

- District Government Annual Assessment of 2016 and 2017; and
- The 2018 First Quarter Assessment for District Government.

A new Inhassoro District Strategic Plan for Development has been drafted for the period after 2015, but unfortunately, it is not yet available for consultation, as is the case of the 2017 National Census of the Population and Housing for Inhassoro District that is still being consolidated at the national level.

3.3.2 Kick-off meeting

A kick-off meeting was held with the newly appointed District Administrator to explain the objectives of the study and obtain consent to go ahead.

3.3.3 Key informant interviews

Key informant interviews started with the District Permanent Secretary, followed by the District health, Women and Social Action Director. These interviews were around the latest developments in the district, particularly the ones after the ESHIA report production. On the latter subject, a collective interview was convened with the heads of planning departments in the different district services. The interview was attended by officers from the Planning Departments of Education, Youth and Technology, Planning and Infrastructure, Economic Activities, Health, Women and Social Action, as well as the District Secretary.

3.3.4 Focus group discussions

Two FGDs were conducted with women, one in Mabime and another in Mangarelane community each one with an average of 20 participants. Attendance for these discussions was rather high by FGD standards.

Figure 3: Focus group at the Mabime village, conducted on 20 June 2018

3.3.5 Impact assessment

3.3.5.1 Identification of impacts

Based on the collected data and expert knowledge, impacts were identified and categorised according to the project phase in which the impacts are likely to occur viz., construction, operation and closure and decommissioning phases.

3.3.5.2 Rating of impacts

Potential impacts are assessed according to the direction, intensity (or severity), duration, extent and probability of occurrence of the impact. These criteria are discussed in more detail below:

- **Direction of an impact** may be positive, neutral or negative with respect to the impact. A positive impact is one which is considered to represent an improvement on the baseline or introduces a positive change. A negative impact is an impact that is considered to represent an adverse change from the baseline or introduces a new undesirable factor;
- **Intensity/Severity** is a measure of the degree of change in measurement or analysis (e.g. the concentration of a metal in water compared to the water quality guideline value for the metal) and is classified as none, negligible, low, moderate or high. The categorisation of the impact intensity may be based on a set of criteria (e.g. health risk levels, ecological concepts and professional judgement). The specialist study must attempt to quantify the intensity and outline the rationale used. Appropriate, widely recognised standards are used as a measure of the level of impact;
- **Duration** refers to the length of time over which an environmental impact may occur: i.e. transient (less than 1 year), short-term (1 to 5 years), medium term (6 to 15 years), long-term (greater than 15 years with the impact ceasing after the closure of the project) or permanent;
- **Scale/Geographic extent** refers to the area that could be affected by the impact and is classified as site, local, regional, national, or international;
- **Probability of occurrence** is a description of the probability of the impact actually occurring as improbable (less than 5% chance), low probability (5% to 40% chance), medium probability (40% to 60% chance), highly probable (most likely, 60% to 90% chance) or definite (impact will definitely occur); and
- **Impact significance** was rated using the scoring system shown in Table 4 below.

Table 4: Scoring system for evaluating impacts

Severity	Duration	Extent	Probability
10 (Very high/do not know)	5 (Permanent)	5 (International)	5 (Definite/do not know)
8 (High)	4 (Long-term - longer than 15 years and impact ceases after the closure of activity)	4 (National)	4 (Highly probable)
6 (Moderate)	3 (Medium term - 6 to 15 years)	3 (Regional)	3 (Medium probability)
4 (Low)	2 (Short-term - 1 to 5 years)	2 (Local)	2 (Low probability)
2 (Minor)	1 (Transient - less than 1 year)	1 (Site)	1 (Improbable)
1 (None)			0 (None)

After ranking these criteria for each impact, a significance rating was calculated using the following formula:

- **SP (significance points) = (severity + duration + extent) x probability.**

The maximum value is 100 significance points (SP). The potential environmental impacts were then rated as of High (SP >75), Moderate (SP 46 – 75), Low (SP ≤15 - 45) or Negligible (SP <15) significance, both with and without mitigation measures in accordance with Table 5.

Table 5: Impact significance rating

Value	Significance	Comment
SP >75	Indicates high social significance	Where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. Impacts of high significance would typically influence the decision to proceed with the project.
SP 46 - 75	Indicates moderate social significance	Where an effect will be experienced, but the impact magnitude is sufficiently small and well within accepted standards, and the receptor is of low sensitivity and value. Such an impact is unlikely to influence the decision. Impacts may justify significant modification of the project design or alternative mitigation.
SP 15 - 45	Indicates low social significance	Where an effect will be experienced, but the impact magnitude is small and is within accepted standards, and the receptor is of low sensitivity and value, or the probability of impact is extremely low. Such an impact is unlikely to influence the decision, although the impact should still be reduced as low as possible, particularly when approaching moderate significance.
SP < 15	Indicates a negligible social significance	Where a resource or receptor will not be affected in any material way by a particular activity. No mitigation is required.
+	Positive impact	Where positive consequences/effects are likely.

In addition to the above rating criteria, the terminology used in this assessment to describe impacts arising from the current project are outlined in Table 6 below. To fully examine the potential changes that the project might produce, the project area can be divided into Areas of Direct Influence (ADI) and Areas of Indirect Influence.

- Direct impacts are defined as changes that are caused by activities related to the project, and they occur at the same time and place where the activities are carried out, i.e. within the ADI; and
- Indirect impacts are those changes that are caused by project-related activities but are felt later in time and outside the ADI.

Table 6: Types of impact

Term for Impact Nature	Definition
Direct impact	Impacts that result from a direct interaction between a planned project activity and the receiving environment/receptors (i.e. between an effluent discharge and receiving water quality).
Indirect impact	Impacts that result from other activities that are encouraged to happen because of the project (i.e., Pollution of water, placing a demand on additional water resources).
Cumulative impact	Impacts that act together with other impacts (including those from concurrent or planned activities) to affect the same resources and receptors as the project.

3.3.5.3 Mitigation measures and recommendations

Mitigation measures were formulated to avoid or reduce negative impacts and to enhance positive ones. Golder used the following criteria when recommending mitigation measures:

- Ability to avoid the impact without having significant negative secondary consequences; and
- Feasibility and cost effectiveness.

After suitable mitigation measures were identified for each impact, the rating procedure described in the section above was repeated to assess the expected significance. The difference between pre and post-mitigation rating represents the degree to which the recommended mitigation measures are expected to be effective in reducing the impacts.

4.0 SOCIO-ECONOMIC BASELINE OF PROJECT-AFFECTED COMMUNITIES

The SIA study area and CTT project location are presented in Figure 1. This map also indicates the villages that fall within the different Districts in the study area.

4.1 Demographics

4.1.1 Population

The Inhassoro District hosts a population of 15 318 inhabitants in 3 991 households, shown in Table 7. This information is based on data obtained through KULA's 2014 household survey and extrapolation of existing data sources. Information gathered through the 2015 FGD's in Pambara, estimate the population of this area to be approximately 7 000 inhabitants who have developed into three settlement groups namely, Pambara 1, 2 and 3.

Table 7: Population Demographics of the villages within the Inhassoro District

Community and village	Number of households	Population numbers
Temane	285	710
Mangungumete	912	3 237
Manusse	341	1 238

Community and village	Number of households	Population numbers
Chitsotso	323	1 305
Mabime	400	1 686
Mapanzene	403	1 500
Chipongo	225	809
Maimelane	672	3 150
Mangarelane	137	548
Litlau	293	1 135
Total	**3 991**	**15 318**

Source: Sasol Petroleum Temane and community leaders

It is anticipated that this project would bring a further influx of employment seekers to the area. The areas of expected influx are within the larger towns of Mangungumete and Maimelane. Previous population statistics for 2005 and 2010 indicates the influx and settlement expansion already experienced in these towns. Figure 3 shows the village of Mangungumete in 2005 and 2010, using Google Earth imagery (there is no recent imagery available for analysis). Settlement expansion is indicated in Table 8 which shows the increase (in square kilometres) in the village footprints between 2005 and 2010 for Mangungumete and Maimelane. The area increase was calculated based on the area where the rooftops are visible on Google Earth imagery. During the previous study, villagers ascribed the main reason for the increase in population size was due to the arrival of work and opportunity seekers.

The percentage increase is high, 72.46% for Mangungumete and 58.45% for Maimelane, when compared to the general population increase in the Inhassoro District of about 15% over the six years from 2007 to 2014.

Table 8: Increase in village size between 2005 and 2010 for Mangungumete and Maimelane in square kilometres

Villages	Year	Area (km^2)	Difference (km^2)	Percentage increase
Mangungumete	2005	2.22	1.61	72.46
	2010	3.84		
Maimelane	2005	3.16	1.85	58.45
	2010	5.00		

4.1.2 Age distribution

According to the Index Mundi (2018), the age structure of Mozambique's population was estimated in 2017 and categorised into different age groups as shown in Table 9.

Table 9: Mozambique age structure

Age groups (years)	No. of males	No. of female	% per age group
0-14	5,975,407	5,908,511	44.7

Age groups (years)	No. of males	No. of female	% per age group
15-24	2,824,012	2,907,033	21.6
25-54	3,409,425	3,875,837	27.4
55-64	435,203	468,939	3.4
65 years and over	352,546	416,793	2.9

4.1.3 Household structure

Different studies over time showed varying results regarding the nature of a family in Inhassoro. A study by the Ministry of State Administration in 2005 (MAE, 2005) to define the socio-economic profile of the Inhassoro District revealed that out of the 124 477 families that existed at that time, the majority (about 45%) were of the extended type, i.e. with one or more relatives apart from children and parents. Households had on average 3 to 5 members. Extended families were followed by core families (parents and children only) and by single individuals (single members). Households with six or more members accounted for 27.3% of all households. These households are production and consumption units consisting of men of the same lineage belonging to different generations, and their wives belonging to other lineages, equally patrilineal, and their respective sons and daughters.

ERM and Consultec (2009) indicated that for the Vilanculos and Inhassoro Districts the average family size was six members. The study also highlighted the absence of men as reflected in the masculinity index (percentage of men to women) of 81.9% for the Inhassoro District. A subsequent study on the socio-demographic profile of Temane and Mangungumete communities in 2010 (Kula, 2010) showed that changes in family structures were occurring. Male-headed households usually consisted of a father, mother and children. However, upon reaching adulthood, children preferred to build their own homes rather than remaining as part of the larger household. As a rule, parents provide space on their land so that the children can build their own independent homes.

Data on the average composition of households obtained through the recent household survey show that there is a higher number of households made up of extended relatives as opposed to those that are composed of core households. The average number of persons per household reported was eight people, reaching up to ten people in the communities of Chipongo, Temane and Mangarelane and about nine persons in Mapanzene and Mangungumete communities. A greater number of family members indicate a high level of dependency rate, the indicator that expresses the ratio between the number of people who are capable of bringing some income, against those who are not able to (children, disabled people, senior citizens, etc.).

4.1.4 Gender

The gender distribution in the project area is mainly female. Two-thirds of Maimelane and Mangungumete which are the most populated villages are female. Communities with a relative balance between female and male population are those in Temane, Mabime, Mapanzene, Chitsotso and Manusse (Table 10). Most males have been reported to be the heads of their households and work as migrant labourers outside the study area (Golder, 2015). As a result, the gender distribution in the study area is female dominant.

Table 10: Gender status of respondents by community and total

Community	Gender			
	Male		Female	
	Number	%	Number	%
Chipongo	12	35.3	22	64.7
Maimelane	9	26.5	25	73.5
Mangungumete	7	20.6	27	79.4
Litlau	12	37.5	20	62.5
Mabime	19	51.4	18	48.6
Mangarelane	15	39.5	23	60.5
Mapanzene	15	44.1	19	55.9
Manusse	14	43.8	18	56.3
Temane	17	53.1	15	46.9
Chitsotso	14	43.8	18	56.3
Total	**134**	**39.5**	**205**	**60.5**

(Golder, 2015)

4.1.5 Land holdings

As detailed in section 2.1.4, the 1997 Land Law recognises a use right to land known as a DUAT, which can be obtained either through customary norms and practices, good faith occupation or through the authorisation of an application presented to the state. In the case of obtaining a DUAT through customary norms and practices or good faith occupation, no registration papers are required. In terms of the project area, it is believed that the vast majority of households located along the water pipeline route have a formal DUAT on the land which they reside and farm while those people residing on the transmission line route do not have a formally registered DUAT. This is supported by data from the Cadastral Office which shows that, in the vicinity of the EN1, a large number of households are reported to have a registered DUAT (Figure 4). In addition, there are a number of DUATs registered within the project area (some by Sasol) (also illustrated in Figure 4)

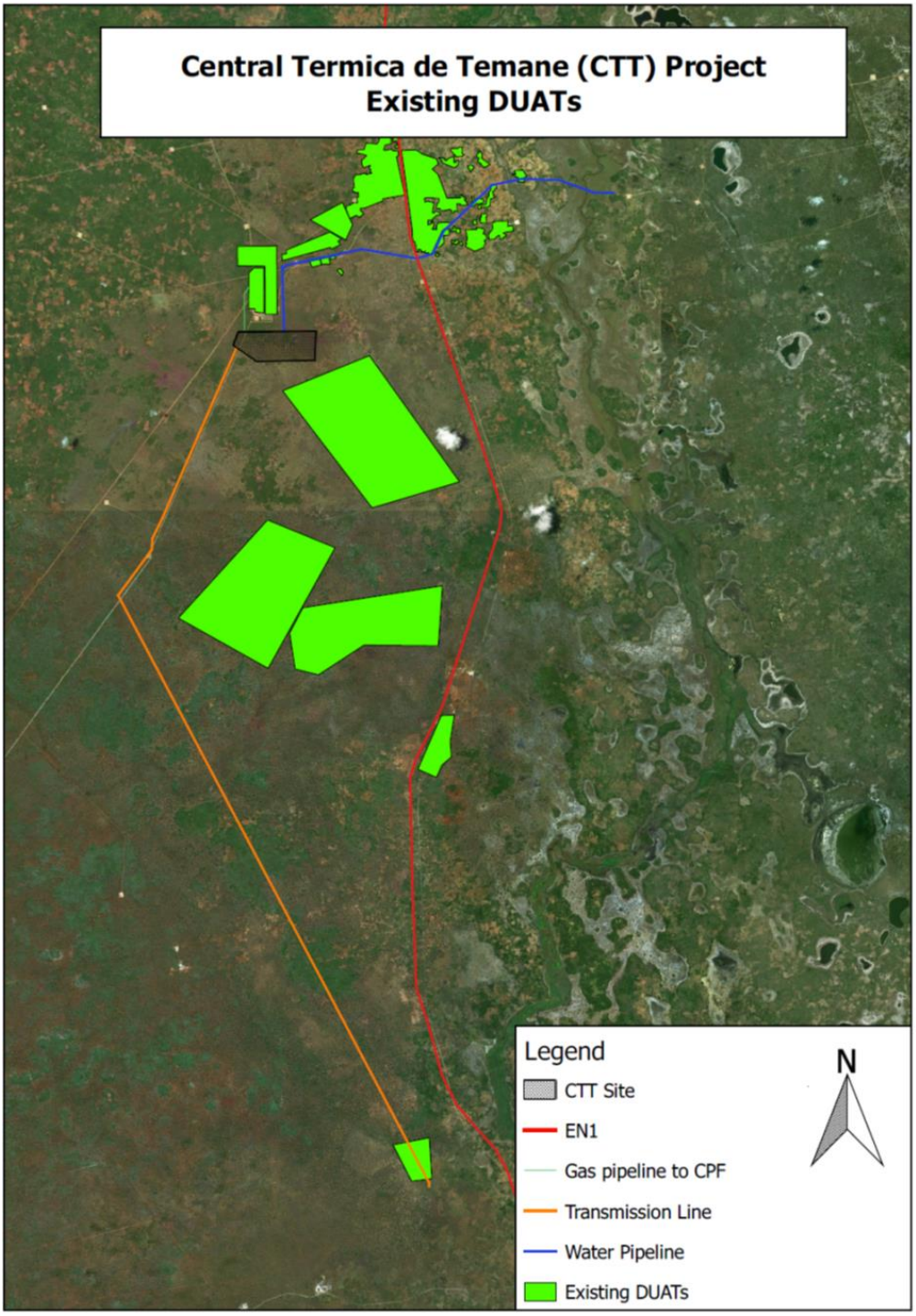

Figure 4: Registered DUATs within the project area

4.1.6 Vulnerable groups

The following vulnerable groups have been identified during fieldwork conducted by Golder (2018a):

- Women-headed households with children and youth.

Seventeen women-headed households with children and youth were identified in the study area.

- Elderly headed households with children (and no other adults).

For this group, four households have been identified within the affected population (however, it should be noted that an additional two households could be classified as 'elderly headed households with children' but have been accounted for under the 'Woman headed households with children and youth'). In these cases, it is likely that the children have moved to live with their grandparents due to the death of their parents, their parents being unable to support them or due to the parents working away from home.

- Women and elderly people living alone.

These two groups have many similarities in terms of vulnerabilities. Women living alone are vulnerable to several social and economic threats, especially in a society where women and men do not enjoy the same benefits. In the same way, the elderly population does not have the same opportunities as younger members of the community, while they are more susceptible to health problems, disabilities and food insecurity. Twenty-six women living alone have been identified in the affected area. Of this group, four are in a critical age group between 70 and 90 years old.

- Mentally disabled persons.

A single, mentally disabled person was recorded as living in the project area. While no medical assessment was undertaken of the individual, reports from neighbours and family members were considered, along with general observations, whereafter it was suspected that the potentially affected individual appeared to be mentally handicapped.

4.1.7 Marital status

The patterns of marital status vary within and across villages among different cultural groups. Based on the survey results, just more than half of the population (58.2%) are married or staying together as married, with the highest numbers reported in Temane (69.7%), Chipongo (63.6%), and Mangarelane (62.2%) (Table 11).

Table 11: Marital status of respondents by community and total

Community	Marital status							
	Single		Married/marital relation		Separated/ divorced		Widow	
	N	%	N	%	N	%	N	%
Chipongo	9	27.3	21	63.6	0	0.0	3	9.1
Maimelane	12	37.5	15	46.9	0	0.0	5	15.6
Mangungumete	14	43.8	15	46.9	2	6.3	1	3.1
Litlau	9	28.1	17	53.1	1	3.1	5	15.6
Mabime	9	26.5	20	58.8	1	2.9	4	11.8
Mangarelane	10	27.0	23	62.2	2	5.4	2	5.4
Mapanzene	11	35.5	18	58.1	0	0.0	2	6.5
Manusse	8	25.8	19	61.3	1	3.2	3	9.7

Community	Marital status							
	Single		Married/marital relation		Separated/ divorced		Widow	
	N	%	N	%	N	%	N	%
Temane	3	9.1	23	69.7	2	6.1	5	15.2
Chitsotso	6	20.0	18	60.0	1	3.3	5	16.7
Total	**91**	**28.0**	**189**	**58.2**	**10**	**3.1**	**35**	**10.8**

4.1.8 Education

Almost half of the respondents (49.0%) had finished primary school, followed by one-third (34.9%) who had no type of formal education. Secondary school (8.2%) and adult literacy (7.3%) is low. None of the respondents had completed a university education, and only 0.6% had completed vocational education.

Maimelane had the highest proportion (28.6%) of people who had completed secondary education and one of the two interviewees who had completed vocational education. Litlau has 14.3% of secondary school graduates. In Temane, the illiterate constitutes about half (48.5%) of all the respondents, and in Maimelane it is 23.5%. Only 17.6% of people surveyed in Mapanzene have no education. Almost two-thirds of respondents (64.7%) had completed primary education, and 8.8% had finished secondary school – this is a real anomaly when considering there is no school in this village. Temane, which has a primary school, had 60.6% of respondents with no education at all, or only adult literacy education. People with completed secondary school finished were only 3.0% of all the contacted persons in Temane in the survey.

There are primary schools in Mabime, Mangarelane, Mangungumete, Chitsotso, Maimelane and Temane, and a secondary school in Inhassoro main village, built and supported by Sasol.

The closest school for the Munavulate community is Menusse Primary School, which is accessed on foot. The proposed transmission line intersects the access route from Munavulate to Menusse village (responses from the Golder FGDs, 2015).

The proposed reasons for children dropping out of school in the project area are the lack of available secondary education facilities in the area and the pressure on children to assist in household livelihood activities. These factors also contribute to the low literacy and education levels in the project area.

The Primary School in Mabime

Primary School in Mangaralane

The Mangungumete Complete Primary School

Chipongo Primary School

Mapanzene School

Figure 5: Some schools in the villages in the study area

4.1.9 Ethnicity

The main ethnolinguistic groups in Inhassoro District comprise the Matsuda, the Ndau and Elomwe. The predominant local language in the region is Xitswa. The native population known as "Bazarutos" or "Mahoca", descendants of Ndau origin Tsonga group, migrated from the Save River to the islands of the Bazaruto Archipelago. This group speaks "Xihoca" which is a mixture of Cindau and Xitswa.

4.1.10 Religion

Religion represents an important entry point for understanding how a community organises its way of life materially and spiritually. Figure 6 shows church structures within the project area.

Figure 6: Three churches in the study area, in Maimelane, Mangugumete and Chipongo

Data from the district government (GDI, 2010) shows about 50 churches at the district level, distributed across all communities, with the majority (11) being Roman Catholic, followed by Evangelical Protestants and Old Apostles with nine churches (Figure 6). The data reported by the household survey confirm the trend illustrated above, the majority of respondents (45%) responded as belonging to the Catholic Church, followed by Protestant Churches (27%). Among the communities covered by the project, the Catholic Church was reported proportionately more spread out in the communities of Mangarelane (84.2% of the respondents), Maimelane (76.5% of the respondents) and Manusse (60.2% of the respondents). Participation in the Protestant church was more reported in the Mangugumete Community (60% of the respondents), Chitsotso (43.8%) and Chipongo (38.2).

Table 12: Religions represented in the Inhassoro District

Religious community	Number of establishments	Community
United Methodist Church of Mozambique	05	Maimelane, Inhassoro and Nhapele
Glorious United Universal Church of Mozambique	05	Maimelane, Inhassoro and Nhapele
Free Methodist Church of Mozambique	03	Maimelane and Inhassoro
Assemblies of God, Christ Vision Church of Mozambique	07	Maimelane, Inhassoro and Nhapele
Assemblies of God International	01	Inhassoro Town
Seventh Day Adventist	08	Maimelane, Inhassoro and Nhapele
Old Apostles	09	Maimelane, Inhassoro, Nhapele, Cometela and Bazaruto
Roman Catholic Church	11	Maimelane, Inhassoro, Nhapele and Bazaruto
Islamic Community	01	Inhassoro Town

Source: PEDD 2011/2015 (GDI, 2010)

The religious profile of these communities indicates a predominance by the Roman Catholic Church, but also the rise in the number of Protestant congregations. That fact might hypothetically indicate a shift in the ethics and local cosmology.

While the “old” and conservative Catholicism supports the ideal of life after death and the eternal heavenly life as a reward for “good” behaviour, Protestant (and other new Pentecostal) preachers advocate for a struggle towards material good and prosperity during the present life. The number of new pastors and denominations with a large mass of followers is rapidly increasing, and that might have consequences in the way these communities see life in general.

4.1.11 Cultural heritage

This section provides a summary of the cultural heritage identified in 2015 and updated in 2018, more details are provided in the cultural heritage report compiled by Golder (2018b).

4.1.11.1 Archaeological remains

According to the cultural heritage report, nine archaeological sites (pre-fixed “AR”) were identified within the study area during the archaeological survey in 2015, none were recorded in 2018 during the updated study (Golder, 2018b). These are shown in Table 13.

Table 13: Archaeological remains within the study area

Site ID	Location/Project Component	Description	Coordinates (UTM 36K)	Estimated Date
AR-103	Along route for transportation of equipment	Small settlement site. Representative of a LIA farming community. Pottery shards on the surface.	716719, 7601505	Late Iron Age
AR-104	c 30 km west of power line	Dispersed Luangwa tradition pottery. Disturbed by agriculture and erosion.	706262, 7596848	Late Iron Age
AR-105	Adjacent to route for transportation of equipment	A small area with a high concentration of Luangwa pottery.	716126, 7598079	Late Iron Age
AR-109	c 9 km east of Mapanzene	Microlith quartz and LIA pottery, high grass cover, some agricultural disturbance.	735064, 7594151	Late Stone Age?
AR-110	The south-eastern extent of the study area	Lago Pecane. Some Luangwa pottery. In a prominent and striking natural promontory location, some agricultural disturbance.	737374, 7567975	Late Iron Age
AR-111	c 5 km south-east of Manusse	Pottery shards.	708393, 7583982	Early and Late Iron Age
AR-112	c 5 km north of the route for transportation of equipment	Malangojiva. Former settlement location - repeatedly mentioned in local histories as one of many former settlements (resettled as a result of recent industrial development).	723071, 7600815	Late Iron Age
AR-114	c 11 km north-east of Mapanzene	Limited evidence – shallow shell midden and some recent ceramic.	736093, 7595224	Late Iron Age
AR-115	c 2 km north of beach landing option at Maritima	Pottery site, almost entirely disturbed by agriculture.	726481, 7619521	Late Iron Age

4.1.11.2 Cemeteries and burials

Nine burials for community leaders were recorded in the study area (BU-101 – 09) in 2015, as well as four cemetery sites (e.g. associated with religious buildings), CE-102 – 105 (Table 14). A fifth cemetery site was identified outside the study area; site CE-101 is a cemetery site on the River Save, approximately 50 km north of the study area.

Table 14: Cemeteries and burials within the study area

Site ID	Site Type	Description	Coordinates (UTM 36K or Lat,Long)	Village/locality
BU-101	Burial	Burial, Sacred Place, claim by the nephew of Pululane Milioro António as Sacred Place and burial of his ancestor. Nothing visible.	708107, 7583993	Manusse
BU-102	Burial	No visible burial. White cotton sheet indicates the area of the cemetery. A survey was undertaken.	726334, 7597963	Mabime
BU-103	Burial	Burial of the founder of Chipongo at the end of 19 c. AD. No visible archaeological evidence.	733919, 7589938	Chipongo
BU-104	Burial	Only two burials are visible. Grass very high. A lot of cobras which are considered protector of ancestors. Interview with local women.	732758, 7601174	Mangarelane
BU-105	Burial	One grave, 15m east of powerline servitude. Identified by the Sasol clearance team.	-21.804111 35.036528	Manusse / powerline
BU-106	Burial	One grave, 30m west of powerline servitude. Identified by the Sasol clearance team.	-21.812833 35.033000	Manusse / powerline
BU-107	Burial	Two graves, 15 m east of powerline servitude. Identified by the Sasol clearance team.	-21.896944 35.071611	EN1
BU-108	Burial	Two graves. Identified by the Sasol clearance team.	-21.898000 35.071583	Powerline
BU-109	Burial	One grave, 3m east of powerline servitude. Identified by the Sasol clearance team.	-21.948611 35.100333	Powerline
BU-110	Burial	The grave of Santos´ Mabime family (father). Identified by the archaeological team during survey 19/06/18.	724897, 7606809	Mangarelane II
BU-111	Burial	Two graves. Unknown family. Identified by the archaeological team during survey 19/06/18.	725666, 7606208	Mangarelane II

Site ID	Site Type	Description	Coordinates (UTM 36K or Lat,Long)	Village/locality
BU-112	Burial	One grave. Unknown family. Identified by the archaeological team during survey 19/06/18.	727810, 7598642	Mabime
CE-101	Cemetery	Partially destroyed by River Save.	710066, 7677891	Mambone
CE-102	Cemetery	Cemetery for people from Nhamanhcea two generations ago.	731614, 7589086	Chipongo
CE-103	Cemetery	Sacred Place, probably with burials. Some recent potsherd found.	722872, 7601191	Mabime
CE-104	Cemetery	Five graves. Identified by the Sasol clearance team.	-21.864917 35.052833	Powerline
CE-105	Cemetery	Three graves. Identified by the Sasol clearance team. Traditional ceremony carried out.	-21.884861 35.064111	Powerline
CE - 106	Cemetery	Five graves. Identified by the archaeological team during survey 19/06/18.	725825, 7606222	Mangarelane II
CE - 107	Cemetery	Seven graves. Identified by the archaeological team during survey 19/06/18.	719326, 7599913	Mabime

4.1.11.3 Churches and mosques

Christianity was found to be prevalent in the project area, sitting alongside traditional religious practice. Six churches (CH-101 – CH-106) were noted across the villages within the study area in 2015, as well as one Mosque (MO-101), approximately 50 km north. Two additional churches, CH-107 and CH-108, were identified in 2018 (Table 15)

Table 15: Churches and mosques within the study area

Site ID	Site Type	Description	Coordinates (UTM 36K or Lat,Long)	Village/locality
CH-101	Church	Remarkable architecture. Needs to be renovated. Interview with Cristina Alfredo. Guardian with the nearby local cemetery.	710518, 76778833	Mambone
CH-102	Church	Evangelical Church Guardian with the nearby local cemetery.	714664, 7612121	EN1
CH-103	Church	Apostolic Church, Assembleia de Deus. Guardian with the nearby local cemetery.	731389, 7589159	Chipongo

Site ID	Site Type	Description	Coordinates (UTM 36K or Lat,Long)	Village/locality
CH-104	Church	Church Apostol's with original rustic architecture.	716789, 7580422	EN1
CH-105	Church	Methodist Church in need of renovation. Interview with the priest. Guardian with the nearby local cemetery.	731957, 7602292	Mangarelane
CH-106	Church	Church St. Ana and professional school for boys and girls. Field Survey, Interview.	716638, 7601677	Maimelane
CH – 107	Church	Catholic Church of St. José (semi-permanent), built with rudimental material. Identified by the archaeological team during survey 19/06/18.	725723, 7606467	Mangarelane II
CH – 108	Church	The Catholic Church (semi-permanent) built with rudimental material. Identified by the archaeological team during survey 19/06/18.	719509, 7599787	Mabime
MO-101	Mosque	Mosque. General information and visit. Guardian with the nearby local cemetery.	710909, 7677940	Mambone

4.1.11.4 Sacred places

Animist activity and traditional ceremonies (tied to a particular natural place of cultural significance, e.g. sacred forest) were observed during the PSA study (2014) and were further investigated during the 2015 and 2018 cultural site surveys as shown in Table 16, changes to the land surface may result in sacred places being impacted if mitigation measures are not followed, this is further highlighted in the cultural heritage impact assessment (Golder18b).

Table 16: Sacred places within the study area

Site ID	Site Type	Description	Coordinates (UTM 36K or Lat,Long)	Village/locality
SP-101	Sacred place	Sacred Place. Field Survey.	694159, 7635550	EN1
SP-102	Sacred place	Sacred Place. Centro de Reavivamento Espiritual. Field survey. Interview completed.	720470, 7615047	Mabime
SP-103	Sacred place	Sacred Place - circumcision. Where skins are buried. Field Survey and	732758, 7601394	Mangarelane

Site ID	Site Type	Description	Coordinates (UTM 36K or Lat,Long)	Village/locality
		interview with local young men recently circumcised done by Ercidio Nhatule in Xitswa.		
SP-104	Sacred place	Sacred Place. Dialogue with some women. Bathing in the Pecane Lake helps pregnant women have healthy children.	737921, 7567790	Vilanculos
SP-105	Sacred place	Considered by local people as Sacred Place but not supported by the church. Possibly an old cemetery.	716489, 7601678	Maimelane
SP-106	Sacred place	Paulo Vilankulos, artist, community leader, traditional doctor. Interview completed.	733919, 7589938	Chipongo
SP-107	Sacred place	Sacred Place, probably burial of community leaders.	731770, 7588865	Chipongo

4.1.11.5 Intangible cultural heritage

The oral tradition was found to be a strong feature among the Xitswa-speaking communities within the study area. The natural landscape and fishing customs are associated with stories, legends, songs and pottery, passed from one generation to the next (Adamowicz & Sinclair 1981, 1984, Adamowicz, 2015). The local communities highly value these elements of intangible heritage, which enhances their sense of identity. It has, however meant that written settlement histories are scarce and feedback on village-founding dates and associated information may vary from person to person (*Ibid*).

As a consequence, the villages were found to differ in age, according to the oral traditions of each community and variations between those results recorded by the PSA and LPG project survey team in 2015 and the recent CTT Project survey were found to exist in the oral record. The following information regarding village names and founding derives primarily from the 2014 PSA and LPG project interviews:

- Mangarelane: Name is very old, probably derived from the first man who settled here approximately 84 years ago, and the man, Mangarelane, who refused to surrender to the Portuguese. Current settlers are 3rd and 4th generation;
- Chipongo: Name derived from the first man who settled here, approximately 35 years ago;
- Mapanzene: Derived from the name Nhagonzoene, the grandchild of Nhagonzo (another settlement in the region) the age of the settlement is unknown;
- Mabime: The name is that of an ancient man with a tumour so large that it touched the ground, the people began to call him Mabime and the name stuck. The age of the settlement is not known;
- Mangugumete: The village is believed to date to colonial times, with the name Mangugumete meaning ‘where someone decides to stay’;

- Menus: The age and origin of the settlement are not known. The interviewee for the 2014 PSA and LPG project survey was noted to have arrived in 1950, attracted by the good agricultural land; and
- Chitsotso: Named after the first founder. This founder had many very children, and the people started to call him Chitsotso, which means locust. The age of the settlement is not known, but the present community arrived in the late 1980s as a result of the civil war.

4.1.12 Tourism

4.1.12.1 Overview

According to the tourism impact assessment study (Golder, 2018c), the town of Inhassoro has developed into a popular tourist location for both holiday and fishing enthusiasts due to the scenic and tranquil environment, recreational and game fishing for amateurs, sport fishing competitions, snorkelling, scuba diving and windsurfing. Inhassoro lies directly opposite the northern point of the Bazaruto Archipelago with Santa Carolina Island in clear view between Bazaruto and the mainland.

This small fishing village has a relaxed atmosphere, and many travellers now choose to base their holiday here, rather than in the bigger, busier town of Vilanculos, 80km south. There are several restaurants, a lively beach bar serving cold beers, a few shops, banks, bakery, hardware store and fuel station. The town also hosts the Central African Deep-Sea Angling Society Mozambique fishing tournament and other fishing competitions. Transfers are available from the international airport at Vilanculos to Inhassoro and from Inhassoro to Bazaruto Island. The Bazaruto Archipelago is considered one of East Africa's best and certainly Mozambique's premier fishing destination.

4.1.13 Protected areas

4.1.13.1 Bazaruto Archipelago National Park

The Bazaruto Archipelago National Park lies within the study area. Designated in 1971, it was the first official National Park in Mozambique, and initially comprised the three southernmost islands Bangue, Magaruque and Benguerua, together with a contiguous sea area extending five kilometres to the west and to the 100 m line of bathymetry to the East. The protected area was then extended in 2002, to include the remaining islands of the archipelago (i.e. Bazaruto and Santa Carolina), and was renamed as the Bazaruto Archipelago National Park, with a total area of 1,430 km^2.

4.1.13.2 Bazaruto Archipelago Important Bird Area

Bazaruto Archipelago Important Bird Area (IBA) consists of the islands of Bazaruto, Santa Carolina, Benguerra and Margaruque, and also the San Sebastião peninsula on the mainland – overlapping in part with the National Park. The most important habitat for birds is the extensive intertidal flats which connect the islands, as the site is designated as an IBA due to its importance as a wintering ground for large numbers of non-breeding migratory waders from the Palearctic.

4.1.14 Health

4.1.14.1 National health profile

As of 2016, the annual population growth rate stood at 2.9%. Similar to other countries in sub-Saharan Africa (SSA), the fertility rate is high (5.9 children per woman) with a significant disparity between urban (4.5) and rural (6.6) settings. Life expectancy at birth is short (56 years in 2016) but has nevertheless shown some increase over the past decades. The health indicators for Mozambique describe a challenging situation with some health data worse than the average for SSA. In 2011, the national infant and under-five mortality rates were reported at 64 and 97 per 1,000 live births, a significant decline from the 1990 figures of 155 and 233, respectively. However, maternal mortality, a useful indicator for health sector performance, remains high, recorded at 408 per 100,000 live births in 2011.

The distribution of disease burden in Mozambique reflects a predominance of communicable diseases, maternal, neonatal and nutritional diseases. The 2015 WHO Burden of Disease estimates put the disease burden in Mozambique at 19.6 million Disability Adjusted Life Year (DALY)[3]. Communicable diseases account for 64% of the burden of disease while the remainder is shared between non-communicable diseases (27%) and injuries (9%). HIV/AIDS (13%), neonatal conditions (12%), acute respiratory infections (8%), malaria (8%) and diarrhoeal diseases (6%) are the leading causes

4.1.14.2 Inhassoro district health profile

The annual health report (2017) shows that Inhassoro District has only one physician for every 31,980 inhabitants and one nurse for every 3,366 inhabitants (compared to the WHO recommended a ratio of 1 per 10,000 and 1 per 1000 respectively). The main reasons for health consultations are malaria, diarrhoea, HIV/AIDS, anaemia, tuberculosis and acute respiratory tract infection including pneumonia.

Inhassoro is generally poorly served with no district hospital (as of 2018) and relies on the district hospital located in Vilanculos. The Sasol Corporate Social Investment (CSI) programme funded the construction of the Mangugumete Health Centre as well as the recently completed health centres in Temane and Pambara (Vilanculos District) to serve surrounding communities. About half of the population of the district is within favourable (0 - 5 km) distance from a health facility, 35% travel more than 10 km to the nearest health facility and the rest travels 15 km or more.

4.1.14.3 Communicable diseases linked to the living environment

Communicable diseases (e.g. acute respiratory infections, pneumonia, tuberculosis, meningitis, plague, leprosy, etc.) rely on fluid exchange, contaminated substances, or close contact to travel from an infected carrier to a healthy individual. Therefore, they are directly linked to housing design, overcrowding and housing inflation. Households in Inhassoro District are generally larger at an average of six persons per household.

Acute respiratory infection (ARI) is responsible for 8% of the disease burden in Mozambique. The disease is only second to malaria as the leading cause of morbidity among young children, nationally. It also emerged from the FGDs in the study area that cough-related illnesses were among the commonest ailments, especially affecting young children. Data from the 2017 district health report show that pneumonia (a severe form of ARI) was the second leading cause of hospitalisation in the district with 31 cases and three deaths in 2017, this increasing fourfold from seven cases and one death in 2016.

Mozambique is ranked among the world's 22 highest TB burden countries; the disease is affecting young adults and people living with HIV/AIDS in particular. Around 12% of the TB cases in the country are children. While some progress has been made, the country continues to register high rates of transmission with around 154,000 new infections per year. Multi-drug resistant TB is an emerging threat, with 911 cases recorded in 2016, a prevalence of 3.7%, nationally. TB is a common cause of morbidity in Inhassoro, with the district registered 248 cases of TB, including 56 that were laboratory confirmed in 2017. The treatment success rate is generally high and has increased from 78% in 2014, to 95% in 2016. The district also recorded a significant decrease in TB deaths from a high of 22 in 2015, to 6 in 2016 and 2 in 2017.

Measles remains a challenge in the country, despite the availability of a safe and effective vaccine. In 2015, measles vaccine coverage was recorded at 83% nationally, thus below the 90% minimum threshold required for herd immunity. Inhassoro District reported 32 suspected cases of measles in 2017 (an increase from 16 in 2016) but no cases were confirmed, or deaths reported. The district records indicate a generally high coverage of measles vaccine, 94% in 2016 and 98% in 2017.

[3] The DALY is a measure of overall disease burden. It is designed to quantify the impact of premature death and disability on a population by combining them into a single, comparable measure. It extends the concept of potential years of life lost due to premature death to include equivalent years of 'healthy' life lost by virtue of being in state of poor health or disability, quantified as years lived with disability.

4.1.14.4 Vector related diseases

Malaria continues to be the principal public health challenge facing Mozambique, contributing 8% of the overall disease burden. The whole country is considered a high transmission area, and the entire population is at risk of infection. Transmission shows a seasonal pattern, with peak season between July and November, which coincides with the warm and wet summer season. Baseline data shows that malaria is the number one cause of morbidity in Inhassoro District. In 2017, the district recorded 27,094 cases of malaria, a fourfold increase from the number of cases recorded in 2016. The number of malaria deaths, however, remained very low, with just four deaths recorded over the period 2014-2017.

The most important arboviral (arthropod-borne viral) diseases that may occur in the project study area are dengue and chikungunya fever. Rift valley fever is also a potential risk. Several species of day-biting mosquitoes, from the genus Aedes and Culex transmit, these diseases and breed in dirty and polluted water or in human-made containers. Often these diseases are not reported due to the similarity in clinical presentation with other febrile illnesses (such as malaria) and diagnostic challenges. Available evidence shows that dengue is prevalent in Mozambique but remains poorly documented. In 2007, flooding caused by the Zambezi river increased the prevalence of dengue with 1600 cases reported in January of that year.

4.1.14.5 Soil, water and waste-related diseases

The prevalence of soil, water and waste-related diseases depend highly on sanitation coverage and access to safe drinking water, factors which often show high variability at national and regional levels. Access to safe drinking water and sanitation remains a huge challenge in Inhassoro District. In 2015, the district had 212 boreholes equipped with hand pumps, of which 31 (15%) were faulty; as well as 17 small piped water systems, of which only 12 were operational. The local communities largely relied on groundwater sources, mainly boreholes fitted with hand pumps as well as shallow hand-dug wells. In most cases, there was only one functional hand pump for the entire village. Mabime village entirely relied on a shallow well and surface water for their drinking and domestic needs.

FGD participants reported that most of their households lacked toilet facilities and this was partly linked to poverty and the “culture” of indiscriminate disposal of human waste (in the bush or open field). Waste disposal remained a challenge with no organised waste collection systems. Domestic waste was generally buried in pits or disposed of in open fields.

Diarrhoeal diseases account for 6% of the disease burden in Mozambique. It is also a leading cause of morbidity in Inhassoro District, owing to the underlying challenges of poor access to safe drinking water and sanitation. Soil-transmitted helminthiasis commonly referred to as intestinal worms, are endemic in Mozambique. Inhassoro District shows a high coverage for preventive chemotherapy against soil-transmitted helminths among children (100% in 2016 and 2017) and pregnant women.

Schistosomiasis, also known as bilharzia, is a disease caused by a parasitic trematode. Freshwater snails are the intermediate hosts, and they become infected with schistosome eggs when the water is contaminated with infected urine or faeces. Baseline data on the occurrence of schistosomiasis in the local communities was not conclusive, with no documentation of the disease in the district annual reports and lack of awareness of the disease by key informants.

4.1.14.6 Sexually transmitted infections, including HIV/AIDS

The HIV epidemic in Mozambique is generalised, but with a higher burden of disease in the southern region, which has links to the higher prevalence rates in South Africa and the migrant labour system. HIV/AIDS is the leading cause of adult morbidity in Inhassoro District. Around 30% of hospitalisations in the district in 2016 were due to HIV, but this fell to 11% in 2017. It is also the single leading cause of deaths, claiming eight lives in 2017, and 32 in 2016. The number of patients on antiretroviral treatment has marginally increased from 947 in 2014,

to 1,089 in 2017. HIV testing services were available in all the district facilities, including health posts. HIV treatment and care services were available in four health facilities, including the two Type 1 Health Centres (Inhassoro and Mangugumete).

Sexually transmitted infections (STIs) such as gonorrhoea, syphilis and chlamydia all cause significant morbidity but are an important consideration as certain STIs can increase the risk of acquiring and transmitting HIV and they can alter the course of HIV disease progression. The prevalence of STIs in Mozambique has been reported around 6% among adults and generally similar between men and women, and information for the district was not documented.

4.1.14.7 Food- and nutrition-related issues

Mozambique's chronic food insecurity sits at 24% (down from 61% in the 1990s), but 80% of the population cannot afford the minimum requirements to meet the needs of an adequate diet. Findings from FGDs show that the majority of the local communities do not have adequate food. Most households eat only one or two meals a day. The diet largely consists of carbohydrates (cassava, maize meal, or rice) and beans or local vegetables. Fish is available at times, while other animal proteins (chicken, meat, or milk) are a rarity. The majority of respondents reported that they buy food from the local market because they do not grow enough to feed their families. Food prices were reported to be increasing, especially rice, maize flour, sugar, and cooking oil.

Malnutrition is considered the underlying cause of death in an estimated 30% of children under-five years in Mozambique. Inhassoro District shows only a few cases of malnutrition recorded in the health units. In 2017, the district recorded nine cases of severe malnutrition, decreasing from 20 cases in 2016. The number of cases of mild and moderate malnutrition was not properly documented. Despite the reported challenges of access to food, FGD participants did not mention malnutrition among their health concerns.

4.1.14.8 Non-communicable diseases

The burden of non-communicable diseases (NCDs) is increasing worldwide. In SSA, it is predicted that NCDs and injuries may cause up to 60% of morbidity and 65% of mortality by 2020; and that this increasing burden may overwhelm already over-stretched health services. The four major NCDs are cardiovascular disease, diabetes mellitus, cancers and chronic respiratory diseases. NCDs are an emerging challenge in Inhassoro District, particularly increasing cases of hypertension.

Ischaemic heart disease and cerebrovascular disease now rank among the top ten causes of overall mortality, with hypertension as the key predisposing factor. Data on the burden of these diseases at the district or community level were not available. Assessment of health facilities revealed that treatment and care for hypertension were available but were limited by a lack of specialised care and poor awareness by patients.

The most common non-infectious chronic respiratory diseases are asthma and chronic obstructive pulmonary disease which includes emphysema, chronic bronchitis, asbestosis, silicosis, etc. The predominant use of biomass fuels by households is an important risk factor considered for chronic respiratory disease in this setting. Key informants reported the occurrence of asthma in the local communities, but the cases were not well documented. There was no data or information on these conditions at the district or local level.

4.1.14.9 Accidents and injuries

Road traffic accidents are a leading cause of injuries in Mozambique, accounting for 5% of DALYs. The main causes are careless driving, drunk driving, fatigue, speeding, poor condition of roads and jaywalking. Road traffic accidents are relatively common in the study area, especially along the main EN1 road. The EN1 road is in generally poor condition, narrow in most parts and relatively busy with heavy commercial vehicles making it quite dangerous.

4.1.14.10 Veterinary medicine and Zoonotic diseases

Zoonotic diseases are caused by infectious agents that can be transmitted between animals and humans. Mozambique remains a high-risk country for rabies. Transmission predominantly occurs from infected dog bites. Once symptoms of the disease develop, rabies is entirely fatal. The most cost-effective mode of prevention is vaccination of domestic dogs. Data indicates that animal bites (especially from dogs and snakes) were common in the project study area.

4.1.14.11 Social determinants of health

The health status of a population is affected by factors known as health determinants. These are varied and include natural and biological factors (age, gender and ethnicity); behaviour and lifestyles, such as smoking, alcohol consumption, diet and physical exercise; the physical and social environment, including housing quality, the workplace and the wider urban and rural environment; and institutional factors such as access to medical care. A mental health programme is in place in Inhassoro District, and in 2015 the district recorded 855 consultations due to mental and behavioural illness of which 232 (27%) were new cases, increasing from 704 cases in 2014.

FGDs show that alcohol abuse is very common in the study area. Consumption ranges from traditional brews (e.g., “nipa” and “sabanga”) to conventional beers and spirits. Tobacco smoking was reported especially among men.

There are high levels of violence against women in Mozambique, and its acceptance as a socio-cultural and traditional norm by many remain a major constraint to the implementation of gender equality commitments. Available data shows that gender-based violence is common in Inhassoro District. In 2017, the district recorded 146 cases of physical violence against women, increasing from 95 in 2016. Cases of sexual violence decreased from 25 in 2016, to 10 in 2017. FGDs revealed that domestic violence is common in the communities, but most victims suffer in silence and cases are not reported (therefore data is likely to be skewed due to under reporting). Alcohol abuse, economic frustrations and mistrust between partners were seen as contributing factors.

4.1.14.12 Maternal and child health

Key indicators for maternal health include maternal mortality, access and quality of antenatal care, delivery care and postnatal care. Data for Inhassoro District show that the number of institutional deliveries increased by 40% between 2014 and 2017. The leading causes of maternal morbidity were pre-eclampsia/eclampsia, obstructed labour and haemorrhage. No cases of maternal deaths were recorded in the district between 2014 and 2017. Access to antenatal services in the district is nearly universal, with 96% of pregnant women in 2017 receiving the full component of skilled antenatal care.

Childhood immunisation against common ailments is an important factor that ensures proper child growth and development; with implications into adulthood. The Mozambique childhood immunisation schedule is well aligned to the WHO recommendations. Inhassoro District has an adequate immunisation programme, with full immunisation coverage increasing from 84.5% in 2014 to 98.8% in 2017. Each of the individual vaccines (in 2017) reached the minimum 80% threshold required for herd immunity indicating that the local communities are generally well protected against outbreaks from the vaccine-preventable diseases.

4.2 Livelihood options

To determine how the respondents, make a living they were asked to name the three main economic activities performed by the household. Subsistence agriculture was indicated as the principal economic activity, followed by poultry and small-scale fishing, which was the third most cited categories of activities. Activities that are least practised include tourism, sea product collection and commercial agriculture. The survey team did not find communities that depend solely and entirely on fishing, only members of communities who combined fishing with other “inland” activities.

Subsistence agriculture was named as one of the three ways of making a living by every respondent of the Temane and Litlau communities. Mangarelane (78.9%), Chipongo (85.3%) and Mangungumete (88.2%) indicated subsistence agriculture fewer times. Rearing of poultry was mentioned in a range of 14.7% (Mangungumete) to 75.8% (Temane). Small-scale fishing follows a very specific geographic distribution: in the coastal communities of Mangarelane (68.4%), Chipongo (50.0%) and Mapanzene (47.1%) about half of the interviewees mentioned it as a way of survival. Except for Maimelane and Mabime (2.9% and 5.4% points respectively), no other communities referred to small-scale fishing. Munuvalate and Pambara are predominantly subsistence farmers and livestock breeders, but they have a large charcoal production operation which sells charcoal commercially. The charcoal production activity is the most lucrative income source for these households (responses from Golder FGDs, 2015). These livelihood options are discussed further in the next sections.

4.2.1 Employment

In 2009, ERM and Consultec (2009) reported that apart from the few school teachers, health workers and other government employees, the only available employment is either directly with Sasol or with the companies contracted to provide various services to the existing Sasol activities. These include security guards for gas well sites, workers in the gas processing facility, and ad hoc construction work. During the 2015 and 2018 fieldwork conducted by Golder, no new sectors of employment were identified. Nearly two-thirds of respondents (64.2%) run their own business as the main source of regular income, this includes the livelihood activities discussed in the next sections. Other employment was indicated as follows: in the private sector (17.7%), work at Sasol (8.0%), in the informal sector (6.0%) and lastly the public sector (4.0%). Relying on own businesses is particularly common in Chipongo (90.6%), Mapanzene (84.8%) and Temane (81.8%), with several other communities also reporting high numbers (Mabime – 69.4%, Litlau – 65.6%, Manusse – 64.7% and Maimelane – 60.0%).

Income from the public sector is limited in Mangarelane, Mapanzene, Manusse and Temane. Work at Sasol, albeit in small numbers, is relatively well distributed among the communities, except Manusse and Mabime where no one indicated being employed by Sasol at the time of the 2014 survey. Employment with Sasol is either for the company itself or for the companies contracted by Sasol to provide various services. These include security guards for well sites, workers in the gas processing facility and ad hoc construction work. Ad hoc opportunities include those provided by past development phases of the gas field, during the rehabilitation or maintenance of the main highway, or construction of fuel stations and other social or commercial facilities. Some local people were employed in past gas field construction phases between 2004 and 2006 but for a short period only. Local communities consider that there were no long-term benefits from this employment and that recruitment favoured those living closer to the CPF west of the EN-1 highway.

The threat of political instability over the past year has caused a serious downturn in the tourism industry of the Inhassoro District. Tourism establishments in and around Inhassoro, and to an extent Vilanculos, report a drastic reduction in bookings as a result. This currently is significantly affecting the flow and spread of income to the district and employment opportunities in the tourism industry. Fishing from the sea provides income to a large proportion of economically active people in Mangarelane, Mapanzene and Chipongo, where most men are practising fishers and where fishing is the main source of family income either in cash or goods. When beach seine fishing is not practised in the closed season, most fishers pursue other forms of income generation and in good years cultivate and benefit from the winter agricultural harvest (ERM/Consultec, 2009).

Household income is directly correlated with the structure of their expenses. The questionnaire, therefore, obtained information on household expenses. “Food” was the main expense (86.9%). At least 80% of respondents in all communities stated that food was the main expense, except for Temane where 69.7% of interviewees listed food as their main expense. Education was listed as the second major expense (4.6%),

followed by health (2.4%) and clothing (0.9%). In Maimelane and Temane, however, more than half (53.3%) of respondents reported education as their main expense.

4.2.2 Food security

4.2.2.1 Vegetable and fruit production

The three main crops produced are maize, groundnuts and cowpeas. Potatoes, millet, sweet potatoes and vegetables are the crops least mentioned as part of agricultural activities. Maize production is consistently undertaken among the different communities, and Chitsotso – the village with the lowest responses – registered maize as the most used crop. The same can be said about groundnut which had the lowest respondents' in the other communities except for Manusse which recorded well above three-quarters of all crops. The existence of potatoes was only registered in Mabime, millet in Manusse and Chitsotso, and sweet potato in Temane.

Household food supply is supplemented with natural resources collected by the communities in the project area. Villagers collect wild fruits and berries in the resource areas around their communities. Other grown fruits and vegetables within the study area include mangos, marula, paw, chilli pepper, nuts, pumpkins and cassava. Figure 7 shows fruits and vegetables sold by a roadside vendor (Golder, 2018f).

Figure 7: Fruits and vegetables sold by a street vendor within the study area

4.2.2.2 Livestock

Chickens and goats are the main livestock species in the communities. Very few of the interviewees rear cattle and sheep. Chickens are reared by more than two-thirds of the respondents in every community except Maimelane where it was closer to 50%. Goat rearing is practised in all areas except for Maimelane, goats are generally kept for household consumption, local sale and to perform traditional rituals. Unfortunately, goat farmers lack appropriate goat farming and management techniques resulting in poor supply. Maimelane community is the only community which reported cattle farming. Sheep rearing was prevalent only in Chitsotso. Figures 8 and Figure 9 illustrate grazing cattle and goats to the west of the Govuro River (Golder, 2018f)

Figure 8: Grazing cattle, photographed to the west of the Govuro River.

Figure 9: Grazing Goats, photographed to the east of the Govuro River.

4.2.2.3 Fishing

The inland villager's fish from nearby freshwater areas (streams, wetlands etc.). The coastal villages utilise the beach area for communal fishing. Fishing is an activity done by all members of the household utilising methods of line and hook or nets and sold at local markets (Figure 10).

Figure 10: Sale of fish at the local market, Inhassoro

4.2.3 Charcoal production

The growing demand for charcoal for use in towns and cities along the coast and in other Districts has made charcoal production more economically rewarding for local communities, putting pressure on the natural woodland resources of the district. This also applies to the sale of firewood. Stacks of cut and neatly piled firewood can be seen for sale along the EN1 and along the gravel road leading from Inhassoro to Vilanculos through the eastern parts of the study area. Community members interviewed separately by the ecology team during their February fieldwork indicated that the harvesting and selling of firewood for some low-income households is one of the most important sources of income. Responses from Golder FGDs in 2015 maintain the same statement that charcoal is the most lucrative cash income source for households in the project area.

This presents an opportunity for sustainable charcoal production to improve the livelihoods of communities, provided that charcoal production policies are in place with the aim of managing forest areas to avoid deforestation.

4.2.4 Palm wine production

Local communities also harvest the palm locally known as Uchema to produce palm wine. Palm wine is sold and consumed by households. The sale of palm wine contributes minimally to household income. The palm appears to be sustainably harvested and is often left in agricultural land due to their economic value.

The role of ecosystem goods and services function and utilisation by communities in the study are detailed further in the ESIA report.

4.3 Access to infrastructure and social services

4.3.1 Housing

Building materials used for building houses are a good sociological indicator for understanding social and economic dynamics of households. The socio-economic status and social recognition of people is reflected in the type of house in which they live, and the kind of materials they use to build their homes. In the project area, houses are predominantly of local and mixed materials with roofs made of tree cuttings, grass and iron sheets; those built of conventional material are located largely at the district headquarters. The floors of the houses for more than 60% of respondents are made from clay, 37% of cement (costly in rural communities). The use of clay as a floor for homes was mainly reported in the communities of Manusse (91%), Mabime (70%), Temane (66.7%) and Mangarelane (60.5%). Cement floors were mainly reported in Mangungumete (58.8%), Maimelane (50%), Chipongo and Mapanzene (reported as 47% of the respondents in each of the communities). The use of wood in the construction of houses was only reported in the community of Mabime, one of the most remote villages where access to wood is easier compared to other materials.

Figure 11: Different types of building materials, depending on the means of the household, and purpose of the structure (top left to right): Chipongo, Mangarelane; middle left to right: Manusse, Mapanzene; bottom, temporary fishing houses on the coast

Long-lasting materials (local and conventional) tend to be used in the construction of permanent homes in the communities of Mapanzene, Mangarelane and Chipongo. Apart from these houses, fishing families make use of temporary homes precariously constructed from less durable materials. These temporary homes form campsites along the coast among and on the dunes or intermediate areas. Fishing families typically spend part of their time throughout the day making preparations for fishing, using the temporary houses to keep their fishing equipment, prepare the fishing nets and repair their boats. The study was undertaken in the preparation of the Tourism Anchor project (IFC, 2013) in Inhassoro identified these camps in Chipongo and Mapanzene. However, they are common to all coastal villages, as observed by the study team. The majority of households are grouped in villages, but there are also some new isolated settlements along the roads with houses scattered among the villages and roads connected by paths.

Pambara is a sprawling settlement which covers the base of the proposed transmission line for the project. It may seem like three settlements as it is referred to as Pambara 1, 2 and 3 but it is in effect one village. The settlement is rural with structures, mainly consisting of straw and reeds which are sourced from the nearby Govuro River (responses from Golder FGDs, 2015).

Figure 12**: Example of dwellings in Pambara**

4.3.2 Water and sanitation

The main source of water (Figure **13**) in the affected communities was indicated being “a well with a hand pump”, which accounts for almost half (47.2%) of all the respondents. “Unprotected well[4]” is the second most used

[4] *An ‘unprotected well’ is a well that is not covered and can allow the introduction of objects or rain water because of that feature*

water source covering 29.9% of the persons contacted. Piped water, be it inside or outside the household yard was only referred to as the main water source by 0.3% of the people who answered the questionnaire.

Regarding communities, the highest use of protected wells occurs in Temane, where 84.4% of the contacted people enjoy the benefit of such sources, while no one stated the use of the unprotected well, piped water or water from a stream/lagoon. People using the latter source of water all came from Mapanzene and Mabime. Mabime is the only one with access to public fountain water as well.

The only community with piped water use was Mangungumete. Munavalate and Pambara source water from similar hand-dug wells as well as the Govuro River when necessary.

Figure 13**: Drinking water, Mabime**

Respondents were asked about the methods used to eliminate human body waste. More than half of the people interviewed (58.4%) stated that they use a traditional pit latrine (with no slab). The percentage is particularly high in Mangungumete (97.1%), Litlau (84.4%) and Maimelane (82.4%) where more than three-quarters of all respondents confirmed the use of this method. The second most cited way of eliminating body waste was to bury human waste outside household premises. 35.5% of respondents indicated the use of this method. Burying waste inside household premises is a procedure followed by only 0.6%.

Temane and Chitsotso were the only two communities where burying human waste inside the household yard takes place, and Mangungumete is the only community where there was no record of burying human waste. Improved latrines were not prevalent in the observed communities. While Chipongo, Mabime, Mangarelane and Mapanzene did not register a single case of improved latrines, the communities that confirmed its presence revealed very low percentages (Mangungumete – 2.9%, Manusse – 3.0%, Temane – 3.0% and Litlau – 3.1%). The distribution of improved latrines seems to be linked to the logistical capacity of distribution rather than to people's preference for one or other means of taking care of their sanitary well-being. As per the CSR policy, the client could invest in the provision of sanitation facilities such as improved latrines.

4.3.3 Roads

Roads in the area are dirt roads, and although narrow in some areas, some roads are in good condition, others are not. Soil erosion and deep mud during the rainy season is a major issue, damages dirt roads and making access difficult. Community members indicated during the 2015 public participation process that lack of good roads prevents them from reaching health facilities.

Communities benefit from roads established by Sasol to existing well sites and along flow lines. These roads provide access to natural resources, to other communities either for social interaction or trade or to reach health centres or schools. During the recent consultation process, several requests were made for upgrading some roads for better access to health facilities. Table 17 shows the road network in the study area. The main mode of transport for the locals includes bicycles, motorbikes and taxis.

Table 17: Road classification in the study area

District	Type / classification	Surface	Number	Links	Length within Districts (Km)
Inhassoro District	Primary	Paved	EN-1	Vilankulo/Inhassoro limit to Inhassoro/Govuro limit	59
	Secondary	Paved	N241	EN-1 – Inhassoro Town	14
	Vicinal	Unpaved	R921	R481 (Mabote) - Cometela - EN-1	83,8

4.3.4 Sources of energy

Only Temane, Mangungumete and Maimelane have electricity. Most cooking is done with local charcoal or wood. Locally made kerosene lamps are used for lighting. In some villages, fairly large solar panels are being used by some inhabitants and smaller panels in others. Solar panels are one of the main imports from migrant workers in South Africa to provide power for their households. A solar panel is one of the main social status defining factors for families in the area.

5.0 IMPACT ASSESSMENT AND RECOMMENDED MITIGATION MEASURES

The impacts have been categorised within the project phase where they are likely to originate viz., construction, operation and decommissioning phases. The significance rating for each impact and appropriate mitigation measures are also provided.

5.1.1 Construction phase

5.1.1.1 Impacts

The construction phase impacts include:

- Three positive impacts, namely employment opportunities, increased economic revenue and improved infrastructure; and
- Seven negative impacts, namely loss of land, physical and economic displacement, temporary disturbance of fishing activities, a population influx, exposure to gender-based violence and sexual exploitation and abuse, inflation, and a risk to community health and safety.

It should be noted that impacts associated on the tourism facilities in Inhassoro as a result of the temporary beach landing activities are described in the tourism impact assessment, and the findings are summarised in the ESIA report.

5.1.1.1.1 Employment opportunities

Most households within the project area face major socio-economic challenges such as poverty, unemployment and lack of adequate social infrastructure and services (section 4.0), construction-related employment has the

potential to generate an income for households during the construction period to support their dependants. The proposed CTT project will require a construction workforce for the establishment of new infrastructure. Consequently, 850 (CCGT) and 690 (OCGE) vacancies will be available during the construction phase for the two respective power generation technologies. In addition to job opportunities, informal trading is likely to occur during the construction phase. For instance, the locals, who will not be able to secure employment from the client might decide to sell food for the convenience of construction workers and contractors on site.

5.1.1.1.2 Increased economic revenue

The capital expenditure on construction activities is likely to enhance economic benefits. During the construction phase, the client will require various goods and services. This is likely to generate economic opportunities for local small business, provided they are formalised and able to meet the client's procurement requirements. It is, however, anticipated that some of the required goods and services might not be available in the local study area. In this case, the client will procure from businesses elsewhere in the country or outside the country. The client will develop a local procurement policy which will be aimed at supporting local sourcing of goods and services. There are also expected to be increased economic revenues for the informal sector as small businesses may receive more customers for the items they sell.

5.1.1.1.3 Improved infrastructure

The transportation of project infrastructure during the construction phase may result in deterioration of roads (if not actively managed). These aspects are detailed in the traffic study conducted by Golder (2018d). The proposed CTT project will contribute to improved infrastructure such as public roads. The client will upgrade roads and a bridge crossing where necessary (dependent on the route selected from the beach landing site to the CTT site). Consequently, this will improve public roads, if adequately maintained.

5.1.1.1.4 Loss of land

During construction, land will be lost due to the establishment of project infrastructure, that will require land acquisition. Project infrastructure that will require land acquisition include:

- Proposed power plant site (CTT area);
- Construction camp and contractor laydown area;
- Transmission line;
- Water pipeline and access road;
- Proposed Vilanculos substation;
- Upgrade of the R241 and EN1 via the temporary Govuro River bypass bridge (Northern route option) or Upgrade of shortcut road linking EN1 to the north-south road via the pipe bridge, which will require to be upgraded (Southern route option); and
- Establishment of the beach landing site and lay down area at one of the three current options being evaluated.

During construction, it is likely that access to portions of land currently used for subsistence and commercial agricultural purposes may be lost (ACER, 2018). The impact that the various infrastructure components may have on access to agricultural land during construction are identified below:

- CTT plant.

  Permanent loss of access will occur in the case of agricultural activities taking place within the footprint of the CTT plant. During the survey undertaken in the project area, no agricultural activities were identified

on the plant site. However, a previous survey in the area in 2014 identified two machambas within the footprint of the site.

- Transmission line and water pipeline.

A number of machambas were recorded within the 100-metre corridor of the transmission line and water pipeline. During the construction of the transmission line and water pipeline, it is likely that access to these machambas will be restricted. Furthermore, in the event of no agricultural activities being permitted within the 100-metre corridor of the transmission line and water pipeline or in the event of access roads being constructed within these corridors, land or portions thereof may be lost permanently.

- Southern transport route.

In the event of the 'southern transport route' being chosen as the preferred option for the transport of equipment from the beach landing site to the project site, it is likely that there may be damage to machambas in areas where the access road will be widened. Such losses will be considered permanent as the widened road is likely to remain in situ following the completion of construction.

At this early stage of project development, the amount of land required for the CTT project cannot be definitively quantified. Therefore, for purposes of the Abbreviated Resettlement and Livelihoods Restoration Plan (ARLRP), a 'worst-case' and 'realistic' scenario have been formulated.

- **Worst-Case Scenario (525 ha)**
  - 145 ha for the Gas to Power Plant, including the 100 m PPZ.
  - 20 ha for the gas pipeline (2 km pipeline with a 100 m PPZ).
  - 250 ha for the transmission line (25 km transmission line with a 100 m PPZ).
  - 110 ha for the water pipeline (11 km pipeline with a 100 m PPZ).
- **Realistic Scenario (290.3 ha)**
  - 145 ha for the Gas to Power Plant, including the 100 m PPZ.
  - 1.2 ha for the gas pipeline (2 km pipeline with a 6 m servitude)[5].
  - 125 ha for the transmission line (25 km transmission line with a 50 m DUAT) (within the 125 ha is a 15 ha exclusion zone (25 km transmission line with a 6 m servitude). The 6 m wide exclusion zone servitude is applied as 3 m either side of the centre line of the transmission line)[6].

A policy of avoidance will be followed at all times and through the careful alignment of project infrastructure, particularly the transmission line, it is anticipated that actual impacts will be less than those recorded in this ARLRP for the 'realistic' scenario.

5.1.1.1.5 Physical and economic displacement

The nature and extent of physical and economic displacement will largely depend on the chosen beach landing site and transport route. Therefore, this impact has been assessed considering the realistic and worst-case scenario. Some of the proposed project activities will result in displacement-related impacts which include both physical and economic displacement to make way for the proposed project infrastructure. In the worst-case

[5] Based on the assumption that a special licence for activities in a PPZ (Land Law, Article 9) will be issued.

[6] Based on the assumption that a special licence for activities in a PPZ (Land Law, Article 9) will be issued for land (meters 25 – 50 either side of the centre line) within the PPZ.

scenario, all homesteads and associated infrastructure within the 100 m corridor of the transmission line, water pipeline and new gas pipeline, and 100 m from the CTT plant will need to be removed with the affected families resettled. In the realistic scenario, all households and associated infrastructure within the required 50 m servitude for the transmission line will need to be removed and the affected families resettled. Such infrastructure will generally be inclusive of houses, bedrooms, outside kitchens, outside bathrooms, toilets, granaries and cattle kraals, chicken runs and so forth.

During construction, the proposed beach landing site, associated infrastructure and the presence of construction machinery may have a negative impact on the fishing and tourism sectors. Access to specific areas for fishers might be temporarily restricted while the construction of the temporary pier and the increased activity in the area may have an impact on catch volumes. These may impact income levels and the livelihoods of the affected parties. These were issues that were raised by members of the Inhassoro Fishing Association during the initial consultation regarding the project. The presence of the temporary pier and large construction machinery (barge, large trucks to transport infrastructure, cranes, etc.) may have a negative impact on the tourism industry in the area. Through discussions with the potentially affected lodges, viz. those immediately adjacent to the proposed sites, it was noted that the presence of such infrastructure and machinery is likely to result in the lodges being less attractive for tourists, resulting in lost income. Table 18 provides the number of people, households, structures and machambas to be resettled.

Table 18: Estimated resettlement required per phase (ACER, 2018)

	Transmission Line		Water Pipeline
	100 m corridor (Worst-Case)	**50 m servitude (Realistic Case)**	**100 m corridor (Worst-Case)**
People	48	5	214
Households	11	2	42
Structures	51	8	170
Machambas	14	11	18*

*This is inclusive of the seven machambas requiring economic resettlement and a further 11 machambas associated with the households requiring physical resettlement.

A total of 11 grave sites, six in the vicinity of the transmission line route and five in the vicinity of the water pipeline route, were recorded. Importantly, some sites are family cemeteries and, therefore, contain more than a single grave. During construction, some of these graves may need to be exhumed and reburied. Impacts on cultural heritage are further described in the Cultural Heritage Impact Assessment with appropriate mitigation measures (Golder, 2018b).

5.1.1.1.6 Temporary disturbance to fishing activities

Fishing is one of the livelihood activities within the project area. As highlighted in section 4.2.2.3, the coastal villages utilise the beach area for communal fishing. Unfortunately, during the construction period fishing activities will be disrupted considering that heavy equipment and pre-fabricated components of the power plant will be brought in by ship and transferred by barge and landed on the selected beach landing site. Consequently, this will result in fishing restrictions which might affect the following:

- Reduced fish quantity for household consumption and sale.

These beach landing activities are expected to occur infrequently – approximately for two weeks every three to four months. The number of trips undertaken daily during the 2-week window is dependent on the tides. However, it is expected that there will be only one or two barge movements per day. These movements may still impose restrictions on communal fisherman over this period.

5.1.1.1.7 Population influx

As indicated in section 4.1.1, the study area has already experienced a significant influx of people in search of work and business opportunities. It is likely that this existing impact will continue to increase considering the proposed CTT project. Consequently, this will have social implications such as:

- Increased pressure on local resources, infrastructure and social services which are already not adequate and enough for the local people; and
- Increased social pathologies such as drug and alcohol abuse, prostitution, gender violence, increased incidence of sexually transmitted diseases and other communicable diseases.

5.1.1.1.8 Inflation

Population influx and increased economic activity in the study area will increase demand for goods and services. Consequently, the increasing pressure on existing supplies may increase prices, resulting in inflation. Unfortunately, the locals will experience negative implications as the cost-of-living increases.

5.1.1.1.9 Exposure to gender-based violence and sexual exploitation and abuse

Due to the influx of employment and business seekers, it is likely that the women and children within the project area will be exposed to gender-based violence and sexual exploitation and abuse. The following factors are likely to induce and escalate gender-based violence and sexual exploitation and abuse within the project area in the form of sex-trafficking, prostitution, domestic violence, sexual abuse and drug abuse:

- Some men seeking employment and business opportunities within the project area are likely to pose a risk to women and children in terms of them being exposed to violence and sexual exploitation. As discussed in section 4.1.5, women and children have been identified as vulnerable;
- Access to disposable income might result in irresponsible financial expenditure such as spending money on drugs, alcohol and prostitution. Consequently, contributing to STIs; and
- Alcohol and drug abuse among construction workers can result in irresponsible behaviours that could escalate to violence or domestic abuse.

The health impact assessment further outlines the impacts related to sexual exploitation and drug abuse in the study area (Golder, 2018e).

5.1.1.1.10 Risk to community health and safety

The proposed project will see an increase in general construction vehicles bringing goods and raw materials to the site (from either Maputo or Beira), so both directions of the EN-1 road will see noticeable increases in construction vehicle numbers and traffic. In addition, certain equipment and components will be brought to the site via a beach landing and transport route from Inhassoro by special heavy vehicles capable of handling abnormally heavy and large dimension loads resulting in the following implications:

- Increased traffic volumes and the presence of heavy goods vehicles;
- Road accidents, mainly affecting locals who are not accustomed to heavy traffic and heavy vehicles;
- Increased dust levels which may result in respiratory problems for the locals and construction workers; and
- Deterioration of roads, which will pose a safety risk to motorists.

These impacts are further described in the Traffic Impact Assessment (Golder, 2018d) and Health Impact Assessment (Golder, 2018e) with appropriate mitigation measures.

5.1.1.2 Rating of impacts

In this section, construction phase impacts are rated based on their significance before and after mitigation (Table 19).

Table 19: Rating of construction phase impacts

Indicator of potential impact	Pre-mitigation					Post-mitigation				
	Severity	Duration	Extent	Probability	Significance	Severity	Duration	Extent	Probability	Significance
Employment opportunities	4	1	2	4	+28	6	1	2	4	+36
Increased economic revenue	4	1	3	4	+32	6	1	3	4	+40
Improved infrastructure	4	1	2	5	+35	6	1	2	5	+45
Loss of land	8	5	2	4	60	6	5	2	4	52
Physical and economic displacement	10	5	2	5	85	4	5	2	5	55
Temporal disturbance to fishing activities (access)	6	1	2	4	36	4	2	2	3	24
Population influx	8	1	2	5	55	6	1	2	2	18
Inflation	6	1	3	4	40	4	1	3	4	45
Exposure to gender-based violence and sexual exploitation and abuse	8	4	2	5	70	6	1	2	3	27
Risk to community health and safety	8		1	2	55	4	1	2	3	21

5.1.1.3 Mitigation measures

The proposed mitigation measures for the construction phase impacts are shown in Table 20.

Table 20: Mitigation measures for construction phase impacts

Impact	Mitigation measures
Employment opportunities	Directly affected communities shall be given special consideration in terms of the benefits arising from the project. The local resident status of applicants should be verified in consultation with community representatives. Where feasible, promote the creation of employment opportunities for women and youth.

Impact	Mitigation measures
	A monitoring system shall be established to ensure that the client honours local employment policies. Development of a local content management plan (includes local employment and procurement of local good and services).
Increased economic revenue	Local businesses shall be given first preference during the procurement of required goods and suitably skilled and available services. Should the client appoint sub-contractors, preference shall be given to suitable local sub-contractors. Development of a local content management plan (includes local employment and procurement of local good and services).
Improved infrastructure	The deterioration of public roads over time must be monitored, and a maintenance plan must be negotiated with the National Road Administration, with specific mention of the Monitoring and Planning departments that should be consulted (Golder, 2018d).
Loss of land	Landowners shall be identified and compensated in accordance with national legislation and WBG standards (currently an abbreviated resettlement plan/abbreviated livelihood restoration plan has been prepared as a first step).
Resettlement	It is recommended that the client should, where possible, use the SETA beach landing site and R241-EN1 road as the transportation route to avoid resettlement associated with the other beach landing and transport route options. Should the client decide not to use the recommended route, project-affected people must be identified and compensated accordingly viz.; the client will have to develop a comprehensive resettlement action plan in accordance with national legislation and WBG standards (currently an abbreviated resettlement plan/abbreviated livelihood restoration plan has been prepared as a first step).
Disturbance to fishing activities	Communication, Safety and awareness measures (such as educational campaigns) shall be put in place to alert and inform community members about the duration, nature and schedule for the delivery of heavy equipment and pre-fabricated components which will be transhipped and barged to the beach landing site. Additionally, fishers should be required to avoid the area on transport days in exchange for in-kind compensation.
Population influx	The client shall develop/updates the influx management framework into a comprehensive influx management plan aimed at identifying areas of potential influx and appropriate influx management measures. The plan should emphasise the need for local recruitment policy, workforce management, promotion of regional diversified growth strategies, implementation of health and safety education programmes and spatial planning, administration and resource allocation.

Impact	Mitigation measures
	Additionally, relevant stakeholders should be engaged and consulted during the development of the detailed influx management plan.
Inflation	The community development plan is aimed at supporting the development of local small businesses to increase the supply of goods and services and avoid escalating costs due to limitations in supply.
Exposure to gender-based violence and sexual exploitation and abuse	Access to the construction site must be controlled to prevent sex workers from entering the construction camp. Implement gender-based violence and sexual exploitation and abuse campaigns (including educational awareness around risks such as sexually transmitted diseases) in the project-affected communities. The client shall implement and develop GBV/SAE prevention and response action plan as described in Community Health, Safety and Security (CHSS) plan.
Risk to community health and safety	The client will need to engage with communities using a dedicated Community Liaison Officer (CLO) and have in place an effective Stakeholder Engagement Plan, inclusive of a Grievance Redress Mechanism for communities to access. All management plans must be implemented, informed to communities and monitored in a consultative manner, particularly implementing dust and noise suppression measures in areas where vehicles will use unsealed roads. The client's community health and safety plan in place and updated regularly. A work camp management plan that clearly specifies a worker code of conduct in place with complaint and sanction mechanisms. Safe travelling speeds must be determined for the transport vehicles and measures should be implemented to ensure that these restrictions are enforced. The client will also need to adhere to the traffic safety measures outlined in the Traffic Management Plan.

5.1.2 Operational phase

5.1.2.1 Impacts

The operational phase impacts include:

- Three positive impacts, namely employment opportunities, electricity supply and community development; and
- Two negative impacts, namely loss of employment and the risk of gender-based violence and sexual exploitation and abuse.

5.1.2.1.1 Employment opportunities

During the operational phase, 70 vacancies will be available (the number will be the same for both power generation options). It is envisaged that the operational phase split between locals and expatriates, the target of expat employees will not exceed 10%. Labour from surrounding communities will be prioritised for unskilled work and skilled work should the locals have the required skills. It may be required that there be an initial period of training and transfer of skills in the first 2 to 3 years before a hand over from an expat to a local employee,

Although the number of available vacancies is not significant, the locals will receive the maximum advantage of employment opportunities during the operational phase. It is anticipated that employment during the operational phase will be over a long period. This employment will contribute positively to the income of the successful local job applicants as they will be able to support their dependants for an extended period. Similar to the construction phase, the operational phase of the proposed project could induce some indirect, informal employment opportunities such as the selling of consumables by the locals.

5.1.2.1.2 Electricity supply

The proposed CTT project will ensure improved, stable and more flexible electricity supply in Mozambique as there is a growing electricity demand. The CTT project will also assist in improving power supply to EDM and a more stable power supply to the north of the country. Consequently, the improved supply of electricity may:

- Enable the country's economic growth because most economic activities are dependent on a reliable and steady supply of electricity; and
- Improve the local business environment and local industry due to a stable electricity supply.

5.1.2.1.3 Community development

As per the CSR policy which was promulgated by the Mozambican Government in 2014, the client will uplift project-affected communities through the implementation of sustainable and integrated community development initiatives. It is anticipated that the client will review community development initiatives which are ongoing in the area (Sasol CPF) and consult with communities to identify and support necessary development gaps related to water supply, education, health and other identified needs. These development initiatives, especially if implemented in consultation with other community development role-players in the area, can contribute considerably towards education, health, socio-economic development, sustainable jobs and income stability within the project area, the client shall develop and present the community development plan before project commencement.

5.1.2.1.4 Loss of employment

Although the majority of the locals will be hired during the construction phase, it is, however, temporary, and the majority of the workforce cannot be kept on during the operation phase. Unfortunately, this may escalate various social consequences such as

- Increase or return of the unemployment rate to previous levels within the project area;
- Financial hardship and poverty;
- Family tensions and breakdown;
- Alienation, shame and stigma; and
- Crime.

Nevertheless, the client will invest in community development initiatives to reduce negative socio-economic impacts associated with poverty.

5.1.2.1.5 Risk of sustained gender-based violence and sexual exploitation and abuse

Although the required workforce during the operational phase will be minimal, some gender-based violence and sexual exploitation may be experienced during the operational phase, if not successfully mitigated during the construction. The reasoning for this includes:

- After the construction phase, the construction workforce might decide to remain behind and reside closer to the CTT plant area in search for operational phase employment opportunities. During this period, they

might continue to interact with locals within the area and engage in risky sexual behaviours *viz.*, unprotected sex and destructive behaviour such as alcohol abuse and domestic violence. The risky sexual and destructive behaviour may result in the formation of dysfunctional families; and

- During operation, the client will not construct a camp for the workforce considering that only 70 people will be employed. The workforce will decide where they want to reside, and most will likely reside in surrounding communities or Inhassoro Town. Consequently, the interaction between the workforce and locals will not be controlled, resulting in people potentially engaging in risky sexual and destructive behaviour.

5.1.2.2 Rating of impacts

In this section, operation phase impacts are rated based on their significance before and after mitigation (Table 21).

Table 21: Rating of operation phase impacts

Indicator of potential impact	Pre-mitigation					Post-mitigation				
	Severity	Duration	Extent	Probability	Significance	Severity	Duration	Extent	Probability	Significance
Employment opportunities	4	4	2	4	+40	8	4	2	5	+70
Electricity supply (economic growth)	6	4	4	4	+56	6	4	4	5	+70
Community development	6	4	2	4	+48	8	4	2	4	+56
Loss of employment	8	5	2	5	75	6	5	2	4	52
Risk of sustained gender-based violence and sexual exploitation and abuse	8	4	2	5	70	4	1	2	3	21

5.1.2.3 Mitigation measures

The proposed mitigation measures for the operation phase impacts are shown in Table 22.

Table 22: Mitigation measures for operation phase impacts

Impact	Mitigation measures
Employment opportunities	Directly affected communities should be given special consideration in terms of the benefits arising from the project. The local resident status of applicants should be verified in consultation with a community representative. Where feasible, promote the creation of employment opportunities for women and youth through skills development programmes.
Electricity supply	All construction phase activities must be executed accordingly to ensure proper functionality during this phase. Stakeholders must be engaged accordingly, and community relations maintained to avoid interruptions during the operation phase (e.g. social unrest).

Impact	Mitigation measures
Community development	A comprehensive community development plan shall be developed by the client prior to the start of the project. During this process, engage stakeholders in the area to gauge whether they can align or synergise with efforts to collaborate on some of the development initiatives planned for the communities. Additionally, the selection of project beneficiaries should be fair and directly affected parties should be given first preference.
Loss of employment	Skills development programmes should be implemented to capacitate the locals with the skills necessary to secure other employment opportunities.
Risk of sustained gender-based violence and sexual exploitation and abuse	Women and youth should be empowered either by being employed to work on the project or be involved in community development initiatives to minimise their financial vulnerability.

5.1.3 Decommissioning phase

5.1.3.1 Impacts

The decommissioning phase impacts include:

- Four negative impacts, namely loss of employment, reduced economic development, reduced community development benefits and the risk to family abandonment.

5.1.3.1.1 Loss of employment

During the decommissioning phase, the operation phase workforce will lose their jobs. Unfortunately, this will also escalate various social consequences as discussed in section 5.1.2.1.4.

5.1.3.1.2 Reduced economic development

The electricity supply from the CTT will stop. There will be reduced local spending by the client and its employees, including tax payments. Consequently, local businesses and the country may be affected from a financial perspective.

5.1.3.1.3 Reduced community investment

All community development initiatives will be handed over to relevant parties by the client; after that, there will be a reduction in local community development investment from the client.

5.1.3.1.4 Risk to family abandonment

Due to the loss of employment, it is anticipated that some women and children may be abandoned during this phase when migrant workers move on, leaving behind single and vulnerable female heads of households.

5.1.3.2 Rating of impacts

In this section, predicted decommissioning phase impacts are rated based on their significance before and after mitigation (Table 23).

Table 23: Rating of decommissioning phase impacts

Indicator of potential impact	Pre-mitigation					Post-mitigation				
	Severity	Duration	Extent	Probability	Significance	Severity	Duration	Extent	Probability	Significance
Loss of employment	8	5	2	5	75	6	5	2	4	52
Reduced economic development	6	5	2	5	65	4	5	2	5	55
Reduced community investment	8	5	2	5	75	6	5	2	4	52
Risk to family abandonment	8	5	2	4	60	4	5	2	4	44

5.1.3.3 Mitigation measures

The proposed mitigation measures for the decommissioning phase impacts are shown in Table 24.

Table 24: Mitigation measures for the decommissioning phase

Impact	Mitigation measures
Loss of employment	Timely and adequate consultation with employees who are dependent on the power plant for employment. Assisting employees in seeking alternative employment at other power plants or related facilities. Training and education of employees to equip them with skills that could benefit them in other industries.
Reduced economic development	Engage local and regional government with respect to the decommissioning phase.
Reduced community investment	The client should develop exit strategies for all its community development initiatives.
Risk of family abandonment	Local women and youth should be empowered either by being employed to work on the project or be involved in community development initiatives to minimise their financial vulnerability.

6.0 POTENTIAL SOCIAL RISKS

This section briefly highlights aspects of the receiving socio-economic environment that would represent significant risks to the proposed development. The potential social risks, which the project might be exposed to are discussed below;

- Community expectations:

Considering the socio-economic conditions in the project area, community expectations regarding the proposed project are anticipated to be related to employment and the implementation of CSI initiatives. Expectations must

be managed by informing communities as to exactly what to expect from the proposed CTT project in terms of employment opportunities and CSI programmes.

- Social unrest and community opposition

The failure to manage community expectations may result in unrest, such as social mobilisation against the project. It is recommended that stakeholder engagement (including grienavce redress) and community liaison are on-going in order to manage expectations, as well as any grievamces:

- Risks associated with physical and economic displacement

Should CTT fail to manage the displacement process in an open, transparent and appropriate manner, this can result in delays to the project implementation schedule if affected people are not satisfied with the process. Additionally, it may also result in reputational risk if it is perceived that the Proponent is not following due process.

7.0 SOCIAL ACTION PLAN

The social action plan aimed at addressing the social implications is presented in Table 25.

Table 25: Social Action plan

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
Construction Phase						
Socio-economic.	Employment opportunities.	Construction and operation phase activities.	The client will liaise with relevant stakeholders and apply employment procedures to ensure that as much as possible of the labour force is local (target 90%) and that directly affected communities are given special consideration (track percentage of employees) in terms of construction phase employment opportunities arising from the project. Additionally, women and youth will be considered during the process (offer training, reach out through local organisations, track numbers employed). Development and implementation of the local content management plan.	■ 90% of locally employed people. ■ Employed local women and youth.	CTT social manager. Community social development officers.	Audit report to be submitted to the HR manager.
Socio-economic.	Increased economic revenue.	Client and employee's expenditure.	The local procurement of goods and services will be promoted throughout the life-cycle of the project.	■ Local procurement of goods and services.	CTT social manager. External consultants/ contractors.	Audit report to be submitted to the procurement manager.

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
Infrastructure.	Improved infrastructure.	CTT road upgrades.	The deterioration of public roads over time must be monitored, and a maintenance plan must be negotiated with the National Road Administration, with specific mention of the Monitoring and Planning departments that should be consulted.	■ Improved public roads.	National Road Administration, CTT personnel. External consultants/ contractors.	Periodic audit report to be submitted to CTT infrastructure manager.
Compensation and livelihoods.	Loss of land.	Establishment of project infrastructure.	Landowners must be identified and compensated and assisted in accordance with national legislation and WBG requirements. As recommended by ACER (2018); ■ In respect of the permanent loss of machambas, replacement land equivalent to the land lost must be sourced, demined, bush cleared, prepared for planting and formally registered (i.e. the affected party must be provided with a DUAT for the new land which will be issued to men and women including collective persons). Any clearing of the area and land	■ Compensation of affected livelihoods.	CTT social manager. External consultants/ contractors.	As part of the resettlement action plan.

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			preparation must preferably be done by hand to minimise soil disturbance to prolong soil fertility. The replacement land must be identified by the local traditional leader and government representative, in line with Mozambican custom and in consultation with the affected persons. In the case of agricultural land being lost permanently, the affected party will also be paid compensation for the loss of a single growing season per season lost. ■ Any affected party found to have experienced damages, losses or lost access to tree crops will be provided with replacement trees on a one-for-one basis. Compensation will be paid on the basis of loss of production and the consequent loss of income accumulated over the period required for the new trees			

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			(replacement trees provided) to become productive. ■ Annual crops will be considered to be temporary damage and compensated for according to the loss of one season's production, based on the size of the area affected. The value per hectare will be determined by yield and price data for the specific crop provided by the GoM, as verified by current market values with the higher of the two values being used. The possibilities include: ▪ Machamba cultivated with only one type of crop, to be compensated for the loss of that particular crop only. ▪ Machamba cultivated with a number of different crops; in which case compensation is to be paid according to the			

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			mixed crop method (basket) or for the actual crops affected. Loss of production is usually limited to a single season. However, in cases where affected parties experience a loss for more than a single season, compensation will be paid for each season which is lost.			
Resettlement and compensation.	Physical and economic displacement.	Establishment of project infrastructure.	Project-affected people must be identified and compensated in accordance with national legislation and WBG requirements viz., the client will have to develop a comprehensive Resettlement Action Plan. It is recommended that (ACER, 2018); ■ Any household that is determined to be within the 'exclusion' zone of any project infrastructure and, thus, directly affected by the proposed project will be eligible for resettlement. All resettled parties will be	■ Compensation of economic and physical displaced people.	CTT social manager with the assistance of Community social development officers and External consultants/ contractors.	As part of the resettlement action plan.

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			entitled to structures of an improved standard (and which comply with the government regulations) to those that were lost and assistance in the moving process. ■ Affected parties will be offered the opportunity to dismantle and salvage any material at their homesteads before demolition. The demolition of homesteads will only take place once the construction of the new homestead is complete, and the affected parties have been successfully resettled and provided with any other compensation and assistance due to them. ■ Any party found to have lost access to agricultural land permanently, will be entitled to land of similar quality and size which has been demined and prepared for agriculture,			

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			and which is located within a reasonable distance from the homestead. Damages to any annual crops and tree crops will be compensated in accordance with the compensation entitlements.			
Livelihoods.	Temporary disturbance to fishing activities.	Transportation of project infrastructure.	Safety and awareness measures must be put in place to alert community members about the duration and schedule for the delivery of heavy equipment and pre-fabricated components. Losses that cannot be avoided must be compensated. Only artisanal fisheries will be eligible for compensation. Compensation will be calculated as follows (ACER, 2018): ■ Determine an average catch's composition (for example, type of fish, class of fish, etc.), volume (weight, quantity, etc.) and effort (type of fishing gear used). This will	■ Safety and awareness workshop. ■ Compensation of losses.	CTT social manager. External consultants/ contractors.	Monthly audit report submitted to CTT social development officer.

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			be determined through a pre-project baseline survey. ■ Establish an acceptable value (for example, per kg, per boat, per person or per day) for a mixed catch (as informed by current market values). An example of this information is provided in Annexure 5. This will be determined through a pre-project baseline survey. ■ Compensation will be paid for the loss of a single day of fishing (this is to dissuade people from purposefully fishing in the project-affected area to obtain compensation). ■ Compensation will also be paid for consumables (for example, diesel) used in the wasted day's fishing effort.			

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
Socio-economic.	Population influx.	Search for work and business opportunities.	client to develops/update a comprehensive Influx Management Plan, relevant stakeholders should be engaged during this process.	■ Population statistics. ■ Pressure on social services and infrastructure.	External consultants/ contractors with the assistance of CTT social manager.	Quarterly audit report submitted to CTT social development officer.
Human rights.	Exposure to gender-based violence and sexual exploitation and abuse.	Population influx.	Access to the construction site must be controlled to prevent sex workers from the construction camp. Implement GBV and SEA campaigns within the project-affected communities. Client to implement GBV action plan as described in CHSS plan: Awareness, codes of conduct, response and referral, accountability framework including GRM.	■ Security at the construction site. ■ GBV/SEA campaigns.	CTT Social manager with the assistance of community social development officers.	Quarterly audit report submitted to CTT site and social development manager.
Socio-economic.	Inflation.	Increased demand for goods and services.	A community development plan aimed at supporting the development of local small businesses to increase the supply of goods and services and avoid	■ Food prices, including the prices for other goods and services such	The client with the assistance of community social development officers.	Periodic audit report submitted to CTT social development manager.

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			escalating costs due to limitations in supply.	as transport, health care services and schools.		
Health and safety.	Risk to community health and safety.	Transportation of project equipment and components. Influx of employment and business seekers.	Dust and noise suppression measures put in place. Safe travelling speed must be determined for the transport vehicles and measures should be implemented to ensure that these restrictions are enforced. Additionally, the client's community health and safety plan must be in place and updated regularly. Code of conduct for CTT personnel will be communicated accordingly. Measures to reduce the influx of people into the area will be put in place.	■ Availability of road signs. ■ Effective dust and noise suppression measures. ■ Effective implementation of community health and safety plan.	CTT Social manager with the assistance of external consultants/ contractors.	Periodic risk report submitted to CTT social development manager.
Operational Phase						

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
Socio-economic.	Employment opportunities.	Operation phase activities.	The client will liaison with relevant stakeholders to ensure that directly affected communities are given special consideration in terms of benefits arising from the project. Additionally, women and youth should be considered during the process.	■ Locally employed people, including women and youth.	CTT social manager External consultants/ contractors CLOs.	Audit report to be submitted to the HR manager.
Infrastructure.	Electricity supply.	CTT project operation.	All construction phase activities must be executed accordingly to ensure proper functionality during this phase. Stakeholders must be engaged accordingly to avoid interruptions during the operation phase.	■ Electricity supply.	CTT social manager External consultants/ contractors.	Periodic audit report submitted to CTT construction manager.
Livelihoods.	Community development.	CSR policy.	The client should develop a comprehensive community development plan before the commencement of the project. Engage socio-economic development institutions in the area to gauge whether they can align or synergise with any of their efforts to collaborate in some of the development initiatives	■ Community development initiatives.	CTT social manager External consultants/ contractors CLOs.	Quarterly audit report submitted to CTT social development officer.

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			planned for the communities. The selection of project beneficiaries should be fair and directly affected parties should be given first preference.			
Socio-economic.	Loss of employment.	Completion of construction phase activities.	Timely and adequate consultation with employees who are dependent on CTT project. Training and education of employees to equip them with skills that could benefit them in other industries.	■ Skills development.	CTT social manager with the assistance of CLOs.	Audit report to be submitted to the HR manager.
Human rights.	Risk of Sustained gender-based violence and sexual exploitation and abuse.	Construction workforce seeking operation phase economic opportunities, and operation phase workforce residing within the communities.	Women and youth should be empowered either by being employed to work on the project or be involved in community development initiatives to minimise their financial vulnerability.	■ Skills development.	CTT social manager with the assistance of CLOs.	Risk report to be submitted to social development manager.
Decommissioning Phase						

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
Socio-economic.	Loss of employment.	Project decommissioning.	Timely and adequate consultation with employees who are dependent on CTT project. Training and education of employees to equip them with skills that could benefit them in other industries.	■ Skills development.	CTT social manager with the assistance of CLOs.	Audit report to be submitted to the HR manager.
Socio-economic.	Reduced economic development.	Reduced expenditure, including tax payments.	Engage local and regional government with respect to the decommissioning phase.	■ Number of people losing their job. ■ Skills development.	CTT social manager with the assistance of CLOs.	Audit report submitted to social development manager.
Livelihoods.	Reduced community investment.	Clients exit from community development initiatives.	The client must ensure that adequate handover is done for all local economic development projects.	■ Implementation of an exit strategy from all community development initiatives.	CTT social manager with the assistance of CLOs.	Audit report submitted to social development manager.
Socio-economic.	The risk to family abandonment.	Loss of employment and business opportunities.	Women and youth to be empowered either by being employed to work on the project or be involved in the community development initiatives to	■ Number of dependent families headed by only women.	CTT social manager with the assistance of CLOs.	Risk report submitted to social development manager.

Aspect	Potential Impact	Impact Source	Detailed Actions	Indicators	Responsibility	Reporting Requirements
			minimise their financial vulnerability.			

8.0 MONITORING PROGRAMME

The monitoring programme aimed at measuring the effectiveness of the recommended mitigation measures and potential new social implications is shown in Table 26.

Table 26: Monitoring programme

Objective	Detailed Actions	Monitoring Location	Frequency	Responsibility
Construction Phase				
Assess the influx of people into the project area, including the construction site.	Monitor the movement of people into the project area, including the associated social implications; and Monitor access to the construction site.	Areas likely to be affected by the influx and project construction site.	Monthly.	CTT social manager; and Construction site manager.
Assess the recruitment of local people and the local procurement of goods and services.	Monitor whether locally affected people have been recruited, including women and youth; and Monitor whether some goods and services are procured locally.	Project-affected communities and businesses within the project area.	Monthly.	External consultant/ contractor with the assistance of the CTT social manager.
Identify landowners and households to be resettled.	Monitor the consultation with directly affected stakeholders.	Project area.	Monthly.	External consultant/ contractor with the assistance of the CTT social manager and CLOs.
Assess the effectiveness of the compensation process.	Monitor affected people until their livelihoods are re-established.	Project-affected communities.	Monthly.	External consultant/ contractor with the assistance of the CTT social manager and CLOs.
Assess livelihood options for women and youth.	Monitor social behaviours and activities within the project area to determine project activities that can benefit women and youth, the percentage of women and youth employed during the construction phase.	Project area.	Monthly.	External consultant/ contractor with the assistance of the CTT social manager and CLOs.
Monitor community health, safety and security.	Monitor increase/ decrease in health statistics, number of accidents involving community members,	Project area.	Monthly.	External consultant/ contractor with the assistance of the CTT

Objective	Detailed Actions	Monitoring Location	Frequency	Responsibility
	reported crime statistics, availability of security personnel's in the area.			social manager and CLOs.
Assess the effectiveness of the grievance system.	Monitor the number of recorded compliments and complaints, the number of satisfactorily resolved complaints signed off by those who registered the complaints.	Project area.	Monthly.	CLOs, CTT social manager and individuals who lodged the complaints.
Operational Phase				
Assess the recruitment of local people and the local procurement of goods and services.	Monitor whether locally affected people have been recruited, including women and youth; and Monitor whether some goods and services are procured locally.	Project-affected communities and businesses within the project area.	Monthly.	External consultant/ contractor with the assistance of the CTT social manager.
Assess the client's community development initiatives.	Monitor community development indicators.	Project area.	Quarterly.	External consultant/ contractor with the assistance of the CTT social manager.
Engage and consult with stakeholders during the project operation phase.	Monitor the stakeholder engagement and consultation accordingly to avoid interruptions during the operation phase.	Project area.	Quarterly.	External consultant/ contractor with the assistance of the CTT social manager and CLOs.
Assess the effectiveness of the grievance system.	Monitor the number of recorded compliments and complaints, number of satisfactorily resolved complaints signed off by those who registered the complaints,	Project area.	Monthly.	CLOs, CTT social manager and individuals who lodged the complaints.
Decommissioning Phase				
Engage and consult with stakeholders during the project.	Monitor consultation with employees and other stakeholders who are	Project area.	Immediately.	External consultant/ contractor with the assistance of the CTT

Objective	Detailed Actions	Monitoring Location	Frequency	Responsibility
	dependent on the CTT project.			social manager and CLOs.
Assess community development indicators and an exit strategy for the client.	Monitor handover of community development initiatives.	Project area.	Immediately.	External consultant/ contractor with the assistance of the CTT social manager and CLOs.
Assess the effectiveness of the grievance system.	Monitor the number of recorded compliments and complaints, number of satisfactorily resolved complaints signed off by those who registered the complaints,	Project area.	Monthly.	CLOs, CTT social manager and individuals who lodged the complaints.

9.0 CONCLUSION

This report has provided the social implications associated with the proposed CTT project. These social implications have been categorised according to the project phase in which they are likely to occur viz., construction, operation and decommissioning phase.

- The construction phase impacts include:
  - Three positive impacts, namely employment opportunities and increased economic revenue and improved infrastructure; and
  - Seven negative impacts, namely loss of land, physical and economic displacement, temporary disturbance of fishing activities, a population influx, exposure to gender-based violence and sexual exploitation and abuse, inflation and the risk to community health and safety.
- The operational phase impacts include:
  - Three positive impacts, namely employment opportunities, electricity supply and community development; and
  - Two negative impacts, namely loss of employment and risk of sustained GBV and sexual exploitation and abuse.
- The decommissioning phase impacts include:
  - Five negative impacts, namely loss of employment, reduced economic development, reduced electricity supply, reduced community investment, the risk to family abandonment.

From these impacts, only one construction phase impact (physical and economic displacement) has been rated as a high negative significance impact (Table 27). Other construction, operation and decommissioning phase impacts have been rated as moderate negative and significant positive impacts, respectively. As shown in Table 27, If mitigation measures are implemented accordingly, it is anticipated that the consequence and probability

of moderate and high negative impacts will be reduced, while moderate positive impacts will on average be enhanced to maximise benefits to the directly affected communities. It is recommended that the mitigation measures highlighted in this report should be implemented fully for the CTT project. Additionally, measures must also be put in place to monitor and assess the implementation of these mitigation measures and take corrective action where necessary.

Table 27: Moderate and high significance impacts

Impacts	Significance rating	
	Pre-mitigation	**Post-mitigation**
Construction Phase		
Employment opportunities	+28	+36
Increased economic revenue	+32	+40
Improved infrastructure	+35	+45
Loss of land	60	52
Physical and economic displacement	85	55
Population influx	55	18
Exposure to gender-based violence and sexual exploitation and abuse	70	27
Risk to community health and safety	55	21
Operational Phase		
Employment opportunities	+40	+70
Electricity supply (economic growth)	+56	+70
Community development	+48	+56
No disturbance to fishing activities	+65	+85
Loss of employment	75	52
Risk of sustained gender-based violence and sexual exploitation and abuse	70	21
Decommissioning Phase		
Loss of employment	75	52
Reduced economic development	65	55
Reduced community investment	75	52
The risk to family abandonment	60	44

10.0 REFERENCES

1) ACER (2018). Central Térmica de Temane project- Abbreviated Resettlement and Livelihoods Restoration Plan.

2) Consultec and ERM (2009). Inhassoro Development Field EIA.

3) Covane, Luis (1989). As Relações Económicas entre Moçambique e a África do Sul, 1850-1964, Maputo, Arquivo Histórico de Moçambique.

4) Covane, Luis (2001). O Trabalho Migratório e a Agricultura no Sul de Moçambique, 1920-1992, Maputo, Promédia.

5) First, Ruth (1998). O mineiro moçambicano: Um estudo sobre a exportação de mão-de-obra em Inhambane, Maputo, Imprensa Universitária.

6) Golder Associates (2014). Draft Environmental Pre-viability and Scope Definition Report.

7) Golder (2018b). Central Térmica de Temane project- Cultural Heritage Impact Assessment.

8) Golder (2018c). Central Térmica de Temane project- Tourism Impact Assessment.

9) Golder (2018d). Central Térmica de Temane project- Traffic Impact Assessment.

10) Golder (2018e). Central Térmica de Temane project- Health Impact Assessment.

11) Golder (2018f). Central Térmica de Temane project- Terrestrial Impact Assessment.

12) Government of Mozambique (GoM) (2006). Action Plan for the Reduction of Absolute Poverty 2006-2009 (PARPA II).

13) Government of Mozambique (GoM) (2011). Poverty Reduction Action Plan 2011-2014 (PARP).

14) Governo do Distrito de Inhassoro (GDI) (2010). Plano Estratégico de Desenvolvimento Distrital 2011-2015.

15) Governo da Província de Inhambane (GPE) (2010). Plano Estratégico da Província de Inhambane 2011-2020.

16) Index mundi (2018). Mozambique demographic profile. https://www.indexmundi.com/mozambique/demographics_profile.html

17) Instituto Nacional de Estatística (INE) (2007). Recenseamento Geral da População e Habitação.

18) Instituto Nacional de Estatística de Moçambique (INE) (2012). Country Data Pool Consulted at 20th August 2012.

19) Instituto Nacional de Estatística de Moçambique (INE) (2012). Mulheres e Homens em Moçambique: Indicadores Seleccionados de Género.

20) KULA (2010) Socio Demographic Profile of the Two Surrounding Communities (Temane and Mangungumete) of the Sasol Temane CPF.

21) KULA: Estudos e Pesquisas Aplicadas, Lda (KULA) and Golder Associados Moçambique Lda (2014) Social and Health Impact Assessment for the for the Sasol PSA and LPG Development project.

22) Ministério do Turismo (MITUR) (2004) Strategic Plan for the Development of Tourism in Mozambique (2004-2013).

23) Reinoud Willemsen and Gail Menzies (2011). Legacy of Sasol CSI projects 2002-2010. Unpublished report by BEHOLD SA on behalf of Synergy –Global Consulting.

24) Salema, Bento (2001). Environmental Impact Study: Specialist Study 5 – Impact on Socio-Economics. Unpublished report by Mark Wood Consultants and Impacto on behalf of Sasol.

25) Sasol Petroleum Temane Lda (2010). Onshore Drilling Environmental Management Plan (d-EMP): Drilling Operations in the Sasol Onshore Exploration and Development Blocks, Inhambane and Sofala Provinces, Mozambique.

26) Sasol Petroleum Temane LDA (2006). Construction Environmental Management Plan (c-EMP). Construction of the Infrastructure associated with the Extraction of Natural Gas, including well sites, Flowlines, Trunklines and Access Roads (excluding well drilling) in the Sasol Exploration Block, in Inhambane and Sofala Provinces, Mozambique.

27) Sasol Petroleum Temane Lda (2013). CPF Facilities Upgrade Construction Environmental Management Plan (c-EMP).

28) Sasol Petroleum Temane Lda (2013). Environmental Management Plan. Operation of the Temane Well-sites, Flowlines, Access Roads and the Central Processing Facility, Inhambane Province, Mozambique.

29) UNDP (2011). Human Development Report 2011: Sustainability and Equity: A Better Future for All, New York.

Signature Page

Golder Associados Moçambique Limitada

Dr Sithandiwe Ntila
Social Scientist

Dr David de Waal
Technical Director - Social Sciences

SN/DDW/ml

NUIT 400196265
Directors: G Michau, RGM Heath

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PPENDIX A

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