Chapter 9

Socio-economic and Community Health Baseline

CONTENTS

9 SOCIO-ECONOMIC AND COMMUNITY HEALTH BASELINE

9.1 INTRODUCTION

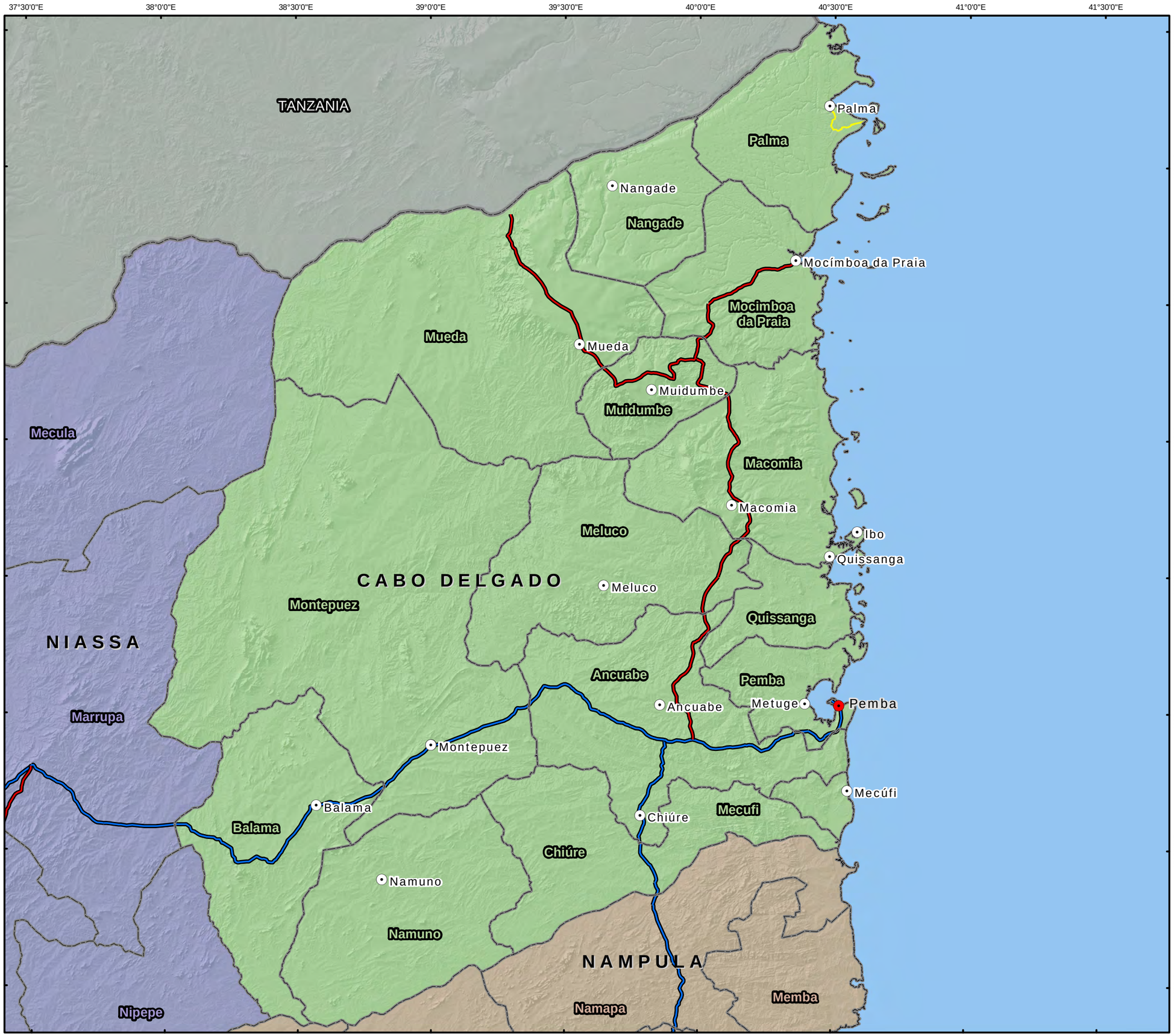
This chapter outlines the socio-economic and health baseline of areas (both onshore and offshore) potentially affected by the Project. The chapter is structured into a number of sections, as follows:

- *Sections 9.2* and *9.3* provide a summary of the baseline and sources of information used to compile the baseline, respectively.
- *Section 9.4* defines the Project Area of Influence, providing both an overview of the geographic characteristics as well as the respective administrative divisions and governance structures.
- *Sections 9.5* to *9.7* provide an overview of Cabo Delgado Province (an important part of the Area of Indirect Influence (1)) and aims to set the broader social, health and economic context in which the Project will be located.
- *Sections 9.8* to *9.14* provide a description of the social, health and economic characteristics of the Area of Direct Influence, which includes Palma District and the Afungi Project Site and Surrounds (including Senga and Maganja).
- *Section 9.15* provides a description of the cultural and religious profile of the Afungi Project Site and Surrounds (including Senga and Maganja).
- *Section 9.16* provides an overview of perceptions and expectations about the Project.
- *Section 9.17* provides an understanding of the shipping movements and types of vessels used within the Study Area.
- *Section 9.18* details the archaeology and cultural heritage baseline of the Afungi Project Site, based on both primary and secondary data.

9.2 SUMMARY

Palma District is located in the north-east of Cabo Delgado Province. *Figure 9.1* and *Figure 9.2* below show Cabo Delgado Province and the Palma District.

(1) Although the Area of Indirect of Influence has a broader scope to the regional (southern and eastern Africa) and national level (Mozambique), the focus of this report will be the Province of Cabo Delgado.



Legend

- District Centre
- Capital City of Cabo Delgado

Roads

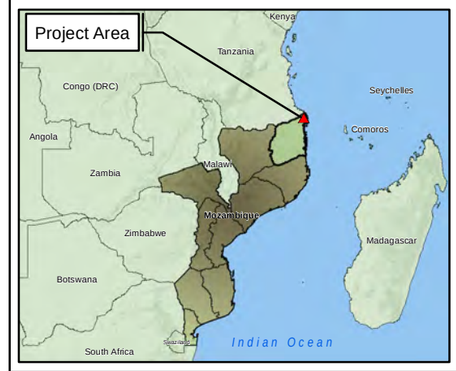
- Primary
- Secondary

- Afungi Project Site
- Boundary with Tanzania

Province

- Cabo Delgado
- Niassa
- Nampula

- District Boundary



MAIN MAP SCALE:

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Figure 9.1: Cabo Delgado Province and Administrative Division

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Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
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DRAWING: Cabo Delgado Province and Administrative Division.mxd

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ERM
Great Westerford Building
240 Main Road
Rondebosch, 7725
Cape Town, SOUTH AFRICA
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Source: DIVA-GIS, Impacto, 2012.
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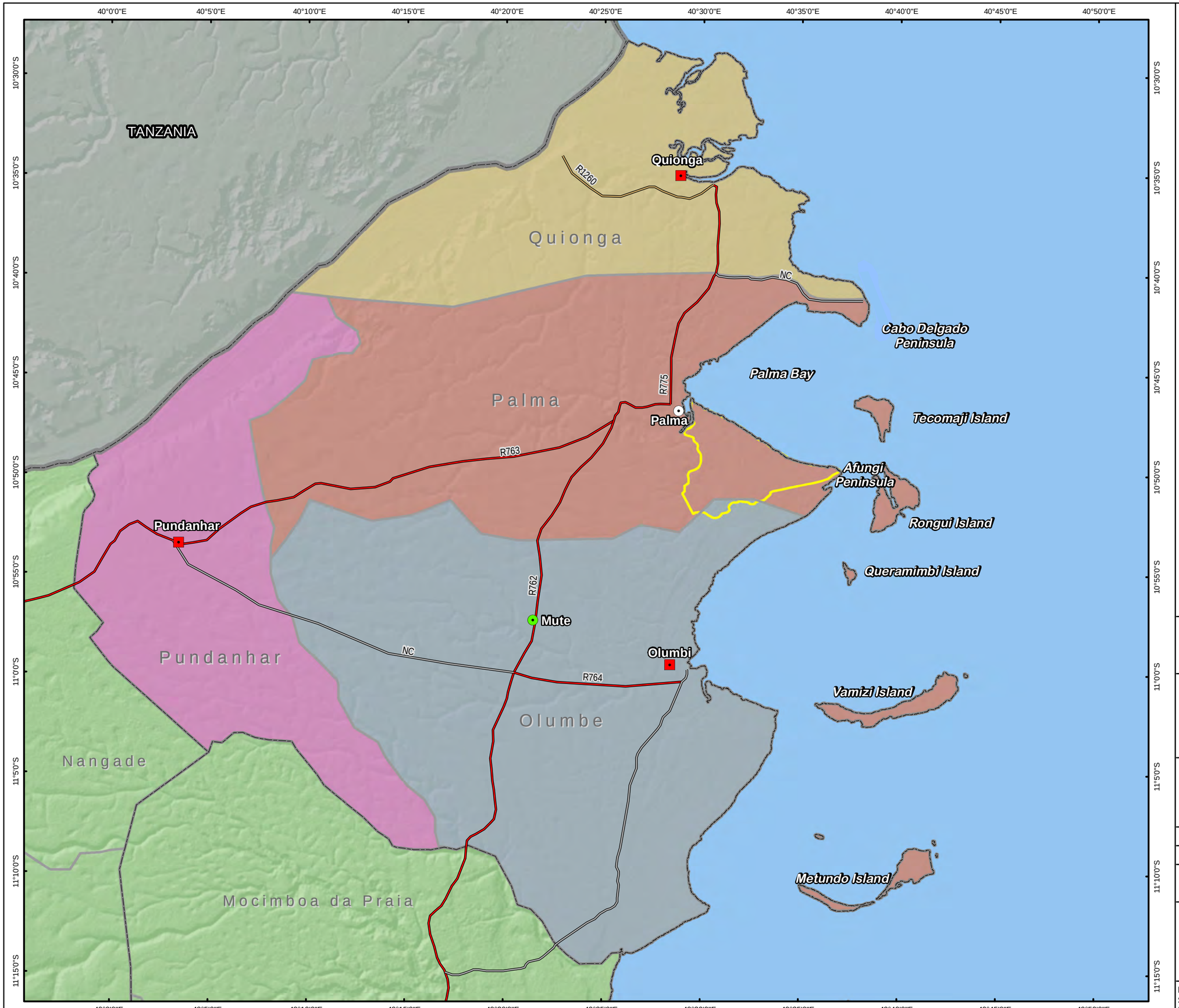

Legend

- District Centre
- Locality Centre
- Administrative Post Centre

Roads

- Tertiary
- Local
- Non Classified

- Afungi Project Site

Province

- Cabo Delgado

- District Boundary

Administrative Post

- Olumbe
- Palma
- Pundanhar
- Quionga

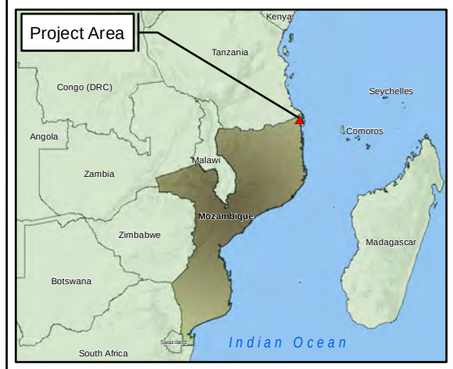

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Figure 9.2: Palma District, Administrative Posts and Localities

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Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
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Palma District comprises four Administrative Posts, six Localities and several villages. The Afungi Project Site is located in the Palma Administrative Post and in the Locality of Mute, south-east of Palma town, as shown in *Figure 9.2* and described in *Section 9.9.2*. In 2012, the population in the Mute Locality was an estimated 16,473 (*Table 9.19*) and accounts for 32 percent of the Palma District population. Within the Afungi Project Site, the population is estimated at approximately 2,700, accounting for 5.3 percent of the Palma District population (*Table 9.20)*.

9.2.1 Education and Employment

In 2007, the level of education in Cabo Delgado was very low, as 81.3 percent of the economically active population (15 years or older) did not complete any level of education. This was a small improvement compared to 1997, when 86.5 percent had not completed any level of education [Mozambican National Institute of Statistics (INE), 2007d]. As in Cabo Delgado Province, the level of education is quite low in Palma District, with 88 percent of the economically active population having no level of education (INE, 2007d). In the Afungi Project Site and Surrounds (including Senga and Maganja), illiteracy is high, especially among women (92 percent).

Low levels of educational attainment can be attributed to the lack of education facilities and an inefficient education system in the District. Challenges faced by the education system in the District include a small number of schools; a limited number of teachers, classrooms and materials such as desks and books; lack of EP2 (Second Level of Primary Education) and higher-level schools; long travel distances to schools (for both teachers and students); high dropout rate due to food security issues (this forces young people to engage in household farming activities during some periods of the year, eg harvesting); and a high dropout rate among young females that may be influenced by early marriages and teenage pregnancy.

In Cabo Delgado Province and Palma District, formal employment is scarce and mostly provided by the State (public officials of local administration, teachers and health professionals). The private sector is almost non-existent, and salaried employment is limited to tourism operators, some small private operators working in commerce and fisheries, temporary employment opportunities associated with recent hydrocarbon exploration projects, and road construction and maintenance contracts. Thus, the population is largely self-employed (1) (85 percent in Cabo Delgado and 87 percent in Palma District), the great majority in agriculture and fisheries, and therefore highly dependent on natural resources for their livelihoods and income earning. Moreover, there is very limited experience and awareness of formal employment procedures and expectations.

(1) Self-employment is an occupational category recognised by the INE to classify people who work on their own (for themselves). This includes formal or informal employment and trade, including surplus from subsistence agriculture and fisheries. The term self-employed is used throughout this report.

Waged employment is not common, and is only reported by approximately 4 percent of the heads of households in the Afungi Project Site and Surroundings (including Senga and Maganja). This is due, among other factors, to lack of investment in employment-generating activities, limited capacity building of human resources due to high-level illiteracy and lack of trained people, and lack of developed infrastructures such as roads, energy and water supply.

9.2.2 *Livelihoods (Agriculture, Fishing and Tourism)*

Most of the agricultural activities are of a small scale and, in general, agricultural productivity is low. In the Afungi Project Site and Surrounds (including Senga and Maganja), subsistence farming is the primary activity for 50 percent of the heads of households, followed by fishing, which is carried out by about 24 percent of heads of households. Agriculture is practised in highland and lowland areas. Highland areas are usually located in the grasslands and adjacent to riverbanks, or in the high/plateau areas with sandy soils. These areas are usually utilised for crop farming such as cassava, sorghum, maize and peanuts, as well as trees such as cashew, mango and coconut. Lowland areas are located in the floodplain areas where the most productive soils are found. These are usually used to produce rice, sweet potatoes, bananas and sugar cane.

Tourism and fisheries are also contributors to the provincial economy. This is attributed to Cabo Delgado being a coastal province with numerous islands located along the coast, which have proved to be a base for the establishment of fishing centres and the development of fishing activity. They are also the main attraction for international tourists, and tourism brings in the most revenue. The District has the potential to develop tourism activities, due to its diversity of marine, coastal and game resources. Industrial tuna fishing occurs in the Exclusive Economic Zone (EEZ) close to the territorial waters of Palma District. Industrial and semi-industrial fisheries by Mozambican operators occur far south of Cabo Delgado Province.

In Palma District, some 21 percent of women are artisanal subsistence fishers, indicating that they already play an important role in ensuring food security for families, as well as generating income. Artisanal fishing is practised by the communities along the coast and along inland waterways, where catches are used for consumption as well as for sale. This constitutes the second-most important activity in terms of food security and income for the domestic economy in the Afungi Project Site and Surroundings (including Senga and Maganja), and is the occupational activity of 24.3 percent of heads of households. For a small percentage of residents, fishing is a source of seasonal employment. During fishing season people fish, and during the off season people grow crops.

9.2.3 Transport

The sea not only supports fishing activities but provides a network for the transportation of goods and services along the Mozambican coastline and to Tanzania. This is, in part, due to the general limited development of transportation infrastructure and services in northern Cabo Delgado and the Palma District. There are a limited number of boats operating in the area and, in terms of transportation, local people tend to walk instead of utilising sea-based transport, as it is expensive. Palma Bay experiences little activity in terms of shipping and navigation activities, with mostly fishing vessels (artisanal), local transport boats (small conventional and artisanal boats) and some recreational navigation (small recreational boats) using the bay. Transit shipping routes in the Mozambique Channel pass between 15 and 25 nautical miles offshore.

The road network infrastructure in the District is poor and not well developed, covering approximately 256km. It consists of tertiary roads, feeder roads and non-classified segments. However, District authorities have implemented road construction and maintenance projects that include repairing and paving some roads.

9.2.4 Health

A vast majority of the households in Palma District rely on unprotected water sources like open wells (60.1 percent); surface water like rivers, lakes and lagoons (7.2 percent); and other unspecified sources (1.6 percent), according to Census 2007 results (INE, 2007). This reliance on unsafe water sources poses a variety of health risks (eg diarrhoea and cholera) for the local population.

There are limited health facilities in the District, with a high number of people in all Administrative Posts living more than 8km from a health facility. The lack of public transport and poor road infrastructure exacerbate the situation. For instance, the nearest hospital is the Rural Hospital of Mocímboa da Praia, located 80km from Palma town, to which patients from Palma requiring major surgery or more specialised medical assistance are referred.

Access to health services is also poor in the Afungi Project Site and Surroundings (including Senga and Maganja). With the exception of the Maganja health facility, all healthcare facilities are located some walking distance away in the Administrative Post centres. However, vaccination services are available for children through First Responders or APEs (Elementary Polyvalent Agents).

9.2.5 Sanitation, Waste and Power

The lack of sanitation facilities is a significant problem facing the communities in Palma District, including in the Afungi Project Site and Surrounds (including Senga and Maganja). Some 81 percent of the population in the Afungi Project Site and Surrounds (including Senga and Maganja) do not have

access to adequate latrines. This poses significant health problems for people, as urinating and defecating in the bush may affect water sources.

There are no formal waste disposal systems or sites in the District, and most people burn or dispose of waste outside their houses or on unoccupied land.

Firewood is used as the main energy source for cooking, followed by palm leaves and coconut fibre. Households mainly use petroleum products and battery-operated flashlights/lamps for lighting.

9.2.6 Heritage and Culture

A notable cultural ceremony in the Afungi Project Site and Surrounds are the initiation rites (for girls and boys) that mark the entry of children into adulthood. These initiation rites are conducted from December to January. Male children are taken to specific locations (usually near a river or lagoon) where they are taught for approximately one month about the activities that await them in their adult lives. Girls are initiated at home. Areas where these ceremonies are undertaken are important to the community, and are used for many generations.

Sacred sites include cemeteries, churches and mosques (where different types of worship services are conducted), as well as sites where initiation rites are performed. Ten archaeological sites were recorded in the area of Afungi Peninsula, as well as one abandoned sacred place and several burial sites. Most of these sites have been affected by extensive cultivation, and those closer to the coast have been influenced by sea erosion. The archaeological finds included beads, shells (including pearl oysters), fish bones and potsherds.

9.3 SOURCES OF INFORMATION

9.3.1 Literature Sources

The information provided in this baseline chapter has been gathered from a wide range of sources. It draws upon a review and analysis of existing information, including data collected for EIAs from the exploration phase of the Project (2008) and from other available sources, including statistical reports and data from the main sectors (tourism, fishing, agriculture) of the Province of Cabo Delgado and the District of Palma. These are referenced where applicable throughout the text.

9.3.2 Baseline Surveys

Location-specific information and data for the area is sparse and, therefore, intensive primary data was also collected through household questionnaires, focus group discussions (FGDs) and interviews for this baseline. The Household Survey findings are described throughout this chapter. The

survey methodologies applied by the socio-economic specialists are presented in *Annex C* and baseline support material are presented in *Annex G*

9.4 SOCIO-ECONOMIC STUDY AREA

9.4.1 Area of Influence

The area of influence is based on the Project's potential direct and indirect impacts associated with the social, health, economic and cultural components that describe the social baseline on which the Project is to be implemented. Two areas of influence have been defined:

- the Area of Indirect Influence; and
- the Area of Direct Influence.

These are further described in the following subsections.

Area of Indirect Influence

From a socio-economic perspective, the Area of Indirect Influence (AII) is broadly defined as the Province of Cabo Delgado (*Figure 9.1*) and, to some extent to Mozambique as a whole, when the economic benefits are considered. As noted previously in *Chapters 1* and *5,* this is due to the socio-economic effects that the Project may have in terms of potential synergies between the Project, public and private sectors on local, regional and national levels, as well as the macro-economic effects on exports, balance of payments and Gross Domestic Product (GDP).

Area of Direct Influence

As described in *Chapter 4*, the main components of the Project are grouped together and discussed as Onshore, Near Shore and Offshore components of the overall Project. The scope of the socio-economic baseline includes physical, social and economic infrastructure, social networks and access to services and economic activities (eg agriculture, fishing, near shore transportation of products and people, collection of natural resources, and other activities carried out by the residents in the Study Area). The scope used to determine the Area of Direct Influence (ADI) are outlined below:

- the large portion of the population residing in the Afungi Project Site, practising subsistence agriculture within its boundaries; and the many households residing outside the Afungi Project Site (within Palma District ie from Palma town, as well as Senga and Maganja villages) also engaged in agricultural activities within the Site;

- the population of Palma town and other villages and areas adjacent to the Afungi Project Site, using the coast and the near shore areas within the

Afungi Project Site for fishing and other activities (ie both primary and secondary livelihood activities);

- the population of Palma town and fishing centres located in Palma District, to the north and south of the Afungi Project Site, also using coastal waters adjacent to the Site for fishing and the transportation of passengers and merchandise along the coast; and

- the broader social considerations, such as access to employment, absorption of local labour, in-migration and settlement by people in search of employment, and increased dynamics of the local economy among others, will have direct effects on the Palma District, recognising that there will be population movements and activities in the surrounding towns and villages and along the Project's primary access routes.

Using the criteria outlined above, the ADI can be described as including:

- Palma District;
- Palma-Sede Administrative Post and Mute Locality; and
- Afungi Project Site.

As stated above and in the methodology, the Household Survey assessed the Afungi Project Site and two main villages located in the vicinity of the Site, namely Senga and Maganja. For the purpose of presenting the Household Survey results, this is described as Afungi Project Site and Surrounds (including Senga and Maganja).

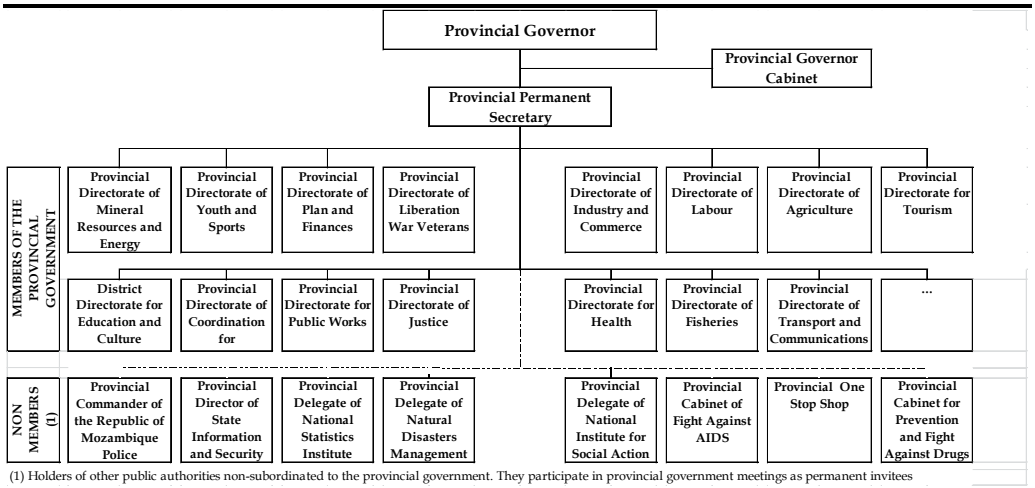
9.5 CABO DELGADO PROVINCE: ADMINISTRATIVE AND POLITICAL OVERVIEW

Cabo Delgado Province is located in northern Mozambique, bordered by Tanzania to the north (by the Rovuma River), Niassa Province to the west, Nampula Province to the south and the Indian Ocean to the east, as shown in *Figure 9.1*.

Cabo Delgado Province is subdivided into 15 districts, with Palma District being the most relevant to this Project, as this is where the Project is to be located. *Figure 9.1* shows the location of Palma District in relation to Cabo Delgado Province.

The governance structure in Cabo Delgado Province (*Figure 9.3*) follows a hierarchical organisational structure headed by a political figure, the Provincial Governor, who is appointed by the President of Mozambique. The Governor's Office is aided by a Permanent Secretary. Several sector institutions, such as environment, agriculture, fisheries, tourism, health, education, mineral resources and energy, to name those most relevant to this study, are represented at a provincial level by Provincial Directorates headed by the respective Provincial Director, which provide the necessary technical support to the Governor's Office.

Figure 9.3 Governance Structure in Cabo Delgado Province



Source: Impacto, 2012.

9.6 CABO DELGADO PROVINCE: SOCIO-DEMOGRAPHIC INDICATORS

9.6.1 Population Distribution

Based on a projected annual growth rate of 2 percent, the population of Cabo Delgado Province in 2012 was estimated to be 1,797,335, representing 6.5 percent of the population of Mozambique (*Table 9.1*). With a growth rate of 1.9 percent, Cabo Delgado has the second-lowest growth rate in the country after Gaza and Inhambane provinces, which have a growth rate of 1.7 percent per annum (INE, 2010b). The low population growth rate in the province is primarily attributed to four factors:

- low birth rate (41 born/1,000 people);
- high infant mortality (88 deaths/1,000 people);
- gross mortality rate (16 deaths/1,000 people); and
- low life expectancy, equivalent to 49 years old.

Table 9.1 Population of Cabo Delgado Province (1997–2012)

Year	Provincial Population	Percentage of National Population	Growth Rate per annum	Men %	Women %	Urban %	Rural %
1997	1,380,202	8.6	1.9	48.4	51.6	16.8	83.2
2007	1,634,162	7.9	1.9	48.4	51.6	20.8	79.2
2012*	1,797,335	6.5	1.9	48.4	51.6	22.9	77.1

Key:
* The 2012 figures represent a forecast based on the projected growth rate of 2%.

Source: INE, 2010b.

9.6.2 *Employment*

Nearly 88 percent of the economically active population of the province is engaged in agriculture, forestry, fishing and extractive activities (*Table 9.2*), while 9 percent work in the tertiary sector (ie trading and finances, administrative services) and 3 percent are engaged in secondary sector activities (industry) (INE, 2010b).

The majority of Mozambique's rural inhabitants are self-employed (1). Waged employment occupies only a small part of the economically active population. In Cabo Delgado Province, 85 percent of the population are self-employed, followed by non-remunerated household workers (9 percent) (2). Less than 5 percent of the population are employed in the public and private sectors.

Table 9.2 Economically Active Population (15 Years and Older) in Cabo Delgado Province by Sector and Employer, 2007

	Total Residents	Sector of Activity (%)	State Employee	Private Company Employee	Self-employed Worker	Non-remunerated Family Worker	Other Dependent Worker
Total residents	664,742		16,288	14,323	563,609	59,523	10,999
Employment position (%)		100.0	2.5	2.2	84.8	9.0	1.7
Agriculture, forestry, fishing and extractive	581,447	87.5	1,064	2,604	517,903	55,563	4,313
Industry and energy	14,337	2.2	557	2,415	10,091	651	623
Construction	6,790	1.0	613	2,253	3,243	248	433
Transport and communications	2,589	0.4	582	1,219	590	45	153
Services	57,987	8.7	13,340	5,742	30,893	2,632	5,380
Unknown	1,592	0.2	132	90	889	384	97

Source: INE, 2010b.

9.6.3 *Education*

The education sector in Mozambique comprises four main subsystems (general, technical and professional, training of teachers and education of adults) and four main levels (primary, basic, intermediate and higher education).

General education constitutes the backbone of the education system, with the primary level divided in two degrees (EP1 and EP2) and the secondary level also subdivided in two cycles (ESG1 and ESG2), as shown in *Table 9.3*.

(1) See *Section* 9.2.1 for the definition of self-employment.
(2) Non-remunerated household workers is a category used by the INE to categorise people aged 15 or older who work for an household without receiving remuneration, eg farming and domestic activities. Generally, they live as a member of the household, receiving food and board. In some cases, they are indirect relatives (nephews or nieces, for example) who live under the protection of the household.

In 2007, there were 1,064 schools in Cabo Delgado Province, of which:

- 78 percent offered the First Degree of Primary Education (EP1);
- 18.7 percent offered the Second Degree of Primary Education (EP2);
- 2.6 percent offered the First Cycle of Secondary Education (ESG1); and
- 0.7 percent offered the Second Cycle of Secondary Education (ESG2).

In Cabo Delgado Province, the illiteracy level was 66.6 percent in 2007, the highest in the country, where the average was 50.3 percent (INE, 2010b) (1). *Table 9.3* compares the level of education completed by the population aged 15 years and older in 1997 and 2007 (INE, 2010d). Among the adult population, 81.3 percent had not completed any level of educational attainment, 10.9 percent completed EP1 and 2.53 percent completed EP2. The proportion of people who completed ESG1 and ESG2 was 3.3 percent and 1.28 percent respectively in 2007 (INE, 2010d).

The determinants that have contributed to these low levels of educational attainment include insufficient education facilities for the population, limited schools offering all levels of primary and secondary education, and insufficient education sector budgets to provide resources such as well-trained teachers. These determinants have led to a high number of people entering adulthood either without attending school, not finishing at least the first level of education (primary school) or not completing higher levels of education.

Table 9.3 Levels of Education Completed by the Population of Cabo Delgado Province (15 Years and Older)

Completed Level of Education	1997 Census		2007 Census	
	Inhabitants	%	Inhabitants	%
Total	742,163	100.00	667,488	100.00
No level	642,180	86.53	542,516	81.28
Literacy (read and write in one language)	1,555	0.21	2,119	0.32
EP1	65,612	8.84	72,757	10.90
EP2	22,866	3.08	16,888	2.53
ESG1	5,759	0.78	22,004	3.30
ESG2	1,622	0.22	8,540	1.28
Elementary Technical Education (ETE)	144	0.02	81	0.01
Basic Technical Education (ETB)	484	0.07	679	0.10
Intermediate Technical Education (ETM)	426	0.,06	535	0.08
Teacher training	708	0.10	897	0.13
Higher education	212	0.03	672	0.10
Unknown	595	0.08	2,762	0.43

Source: INE, 2010b.

(1) The illiteracy level refers to the percentage of the population within the group of 15 years of age or older who do not know how to read and write in any language.

9.6.4 Road Infrastructure

The road network across the province is relatively poor. Of the total roads, 15 percent are classified as primary and 14 percent as secondary roads, while the majority (57 percent) are classified as tertiary roads and the remainder are feeder roads. *Figure 9.4* below and *Table 1.3* in *Annex G* show the road network in Cabo Delgado Province, according to the official road classification. The two primary roads linking the province with the remainder of the country are the N1 and N14.

The N1 links Cabo Delgado Province with the southern and central parts of the country and also connects the province with Nampula Province (cities of Nacala and Nampula) via the Erati and Nacaroa districts. The N14 links Cabo Delgado Province to Niassa Province. It intersects with the N1 at Miéze, then continues to link the Marrupa and Majune districts in Niassa Province.

The main secondary road in Cabo Delgado Province is the N380, which extends some 259km. Some sections of the road are paved, whereas other sections are unpaved and in a poor condition. The road links the city of Pemba with the north and north-western districts in the province, and terminates in Mocímboa da Praia.

The main tertiary road is the R762, which extends some 291km. It is a compacted-earth road that runs in a northerly direction along the coast to Palma, and passes through Mocímboa da Praia. This road, along with the R775 and R1260 (1) is currently (2) being paved between Mocímboa da Praia and the Tanzania border in Namoto. Linking with the N380, these roads connect the provinces in the north, south and centre of the country, as well as extend to Tanzania.

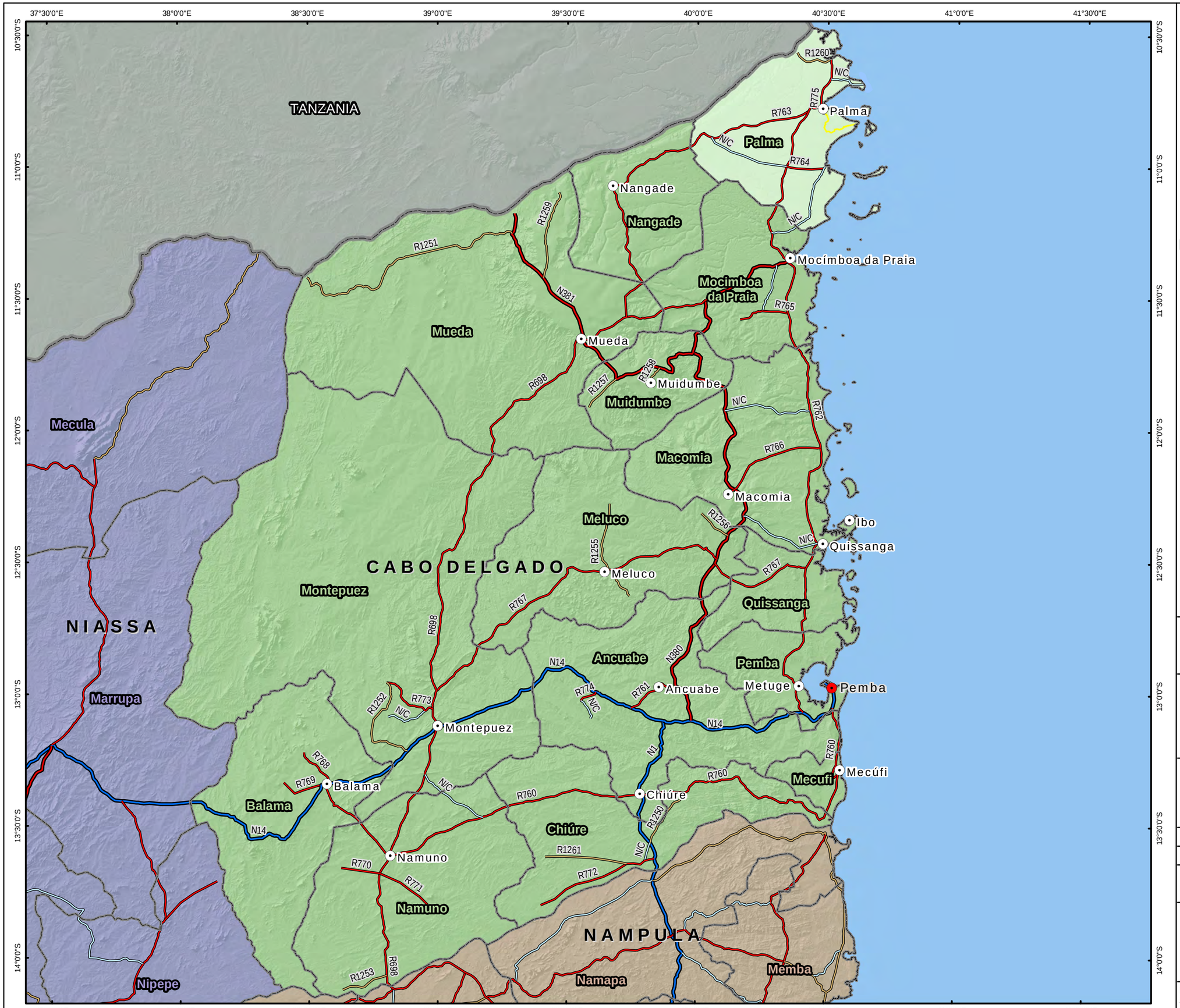
9.6.5 Water Supply

There are three main types of water supply in Cabo Delgado Province. In the urban areas, water is mainly supplied by FIPAG (the Water Supply Investment and Asset Fund) via a centralised/piped water supply system that sources water from boreholes nearly 40km from Pemba (Pemba Metuge District). In the District and some Administrative Post centres, water is sourced from small piped systems managed by the District Administration or private operators. Water from these small piped systems is abstracted from varying sources, including boreholes and surface waters. In rural areas (most villages), water is sourced from springs, wells and boreholes (with handpumps), and these are managed by the local communities that, according to the Water Law, must organise themselves in Water Committees and Maintenance and Repair Groups. In 2010, approximately 13 percent of

(1) The R762, R775 and R1260 connect Mocímboa da Praia with Palma, Palma with Quionga, and Quionga with Namoto (on the Rovuma River border established with Tanzania) respectively.
(2) February 2013.

boreholes with handpumps in the province were not operational (Government of the Province of Cabo Delgado, 2010a) (1).

(1) Boreholes with handpumps are generally non-operational due to breakdowns of the pumps, lack of water because of defects in construction or an insufficient water table or low quality of the water (brackish water).



Legend

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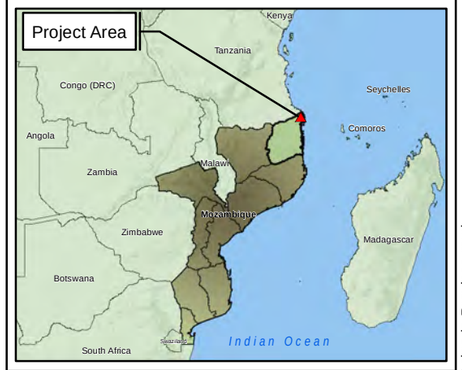
- District Boundary
- Palma District



MAIN MAP SCALE:

0 20 40 60 80

Kilometers

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TITLE:

Figure 9.4: Road Network in Cabo Delgado Province

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 1 500 000

DRAWING: Road Network in Cabo Delgado Province.mxd

REV: A

ERM
Great Westerford Building
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Rondebosch, 7725
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Fax +27 21 686 073

Impacto Projectos e Estudos Ambientais

ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS, Impacto, 2012.
Inset Map: Esri Data & Maps

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9.6.6 *Poverty Levels*

Table 9.4 shows the results of the poverty assessments of Cabo Delgado Province over three periods, extending from 1996 to 2009. The assessments are based on consumption and expenditure patterns for a basic basket of food items (Mozambican Ministry of Planning and Development, 2010). In the period 2002 to 2003, the province had the third-highest levels of poverty in the country (63.2 percent). Inhambane Province and Maputo Province had the highest (80.7 percent) and second-highest (69.3 percent) poverty levels countrywide.

Poverty levels in Cabo Delgado Province decreased to 37.4 percent in the period 2008 to 2009. This was lower than the national average (54.7 percent) and the average level for northern Mozambique (46.5 percent) for the same period. The 25.8 percent decrease in provincial poverty levels can, in part, be attributed to a better 2008–2009 agriculture campaign aimed at improving household consumption patterns, as well as improvements in access to public services and infrastructures – especially transportation infrastructure, which increased access to trading networks (1).

Table 9.4 Poverty Levels in Cabo Delgado Province, Northern Mozambique and the Country

Location	Poverty Levels (%)		
	1996–1997	2002–2003	2008–2009
Cabo Delgado Province	57.4	63.2	37.4
Northern Mozambique	66.3	55.3	46.5
National	69.4	54.1	54.7

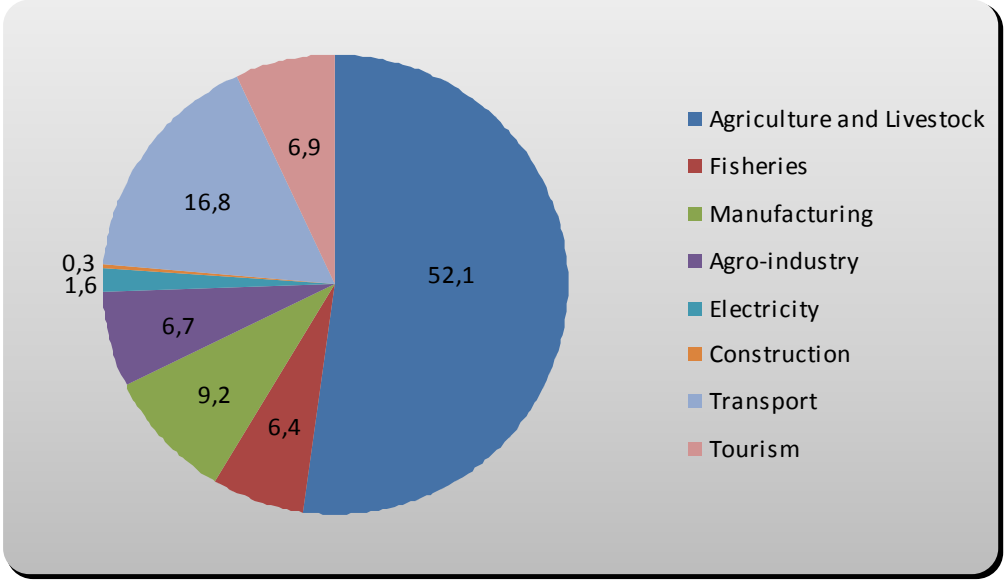
Source: Mozambican Ministry of Planning and Development, 2010.

9.7 *CABO DELGADO PROVINCE: ECONOMIC ACTIVITIES*

A range of economic activities are undertaken in Cabo Delgado Province, with agriculture (52 percent), transportation (16.8 percent) and the manufacturing industry (9.2 percent) sectors being the dominant contributors (Government of the Province of Cabo Delgado, 2010a). *Figure 9.5* below and *Table 1.2* in *Annex G* provide an overview of the economic sectors and their contribution to the province's global production in 2010. Each activity is described further below.

(1) The report titled *Poverty and Well-being in Mozambique: Third National Evaluation* does not analyse in detail the factors that influenced the decrease of poverty at provincial level.

Figure 9.5 ***Contributors to Global Production in Cabo Delgado Province (Percentage in Meticais)***



Source: Government of the Province of Cabo Delgado, 2010a.

9.7.1 Agriculture

The economy of Cabo Delgado Province is dominated by subsistence agriculture. Agricultural activities comprise crop and livestock farming, and most farming activities are undertaken for subsistence purposes. The main food crops grown are maize, sorghum, rice, pearl millet, beans, groundnuts, cassava and sweet potato. Households only sell produce at the local markets when there is a surplus. Cash crops include cashew, sesame and cotton (see *Table 9.5*). Cotton production has, however, declined in the past years due to decreasing prices in the international markets. In the coastal areas, coconut is grown for household consumption and for sale on the local and regional market (Government of the Province of Cabo Delgado, 2010a). Most farming is undertaken by households using slash-and-burn practice in a rain-fed regime. The majority of farmers use manual labour as there are no irrigation systems to water the crops.

Table 9.5 ***Agricultural Production in Cabo Delgado Province, 2010***

Crops	Cultivated Area in 2010 (ha)	Production (t)
Food Crops		
Maize	260,959	369,199
Sorghum	129,487	109,307
Rice	67,869	80,428
Pearl millet	9,169	6,418
Beans	112,399	141,588
Groundnuts	77,795	63,705
Cassava	326,432	1,281,316
Sweet potato	11,061	24,752
Horticultural products	6,820	6,584
Cash Crops		

Crops	Cultivated Area in 2010 (ha)	Production (t)
Cashew	1,305,385*	10,846**
Cotton	35,589	16,453
Sesame	35,019	18,895

Source: Government of the Province of Cabo Delgado, 2010a.

9.7.2 Transport

The provincial transportation sector is primarily driven by Pemba port and airport operations, including the transport of cargo and passengers by several medium and small private operators within the province. From a regional perspective, the transportation sector involves linkages mainly with the northern provinces of Nampula and Niassa as well as the Tanzanian border, utilising the natural border provided by the Rovuma River.

The port facilities in Pemba are one of the main points of entry for merchandise in the province and the main point of exports, although some cargo is taken to the province or exported via the port of Nacala in Nampula Province, south of Cabo Delgado. Domestic and international passengers (mostly tourists) arrive daily at Pemba International Airport.

The port and airport are also important logistics points for vessels and aircrafts supporting petroleum and hydrocarbon development activities. The importance of the transport sector in the province's economy (the second-largest contributor) is influenced by the petroleum and hydrocarbon development activities undertaken by international companies operating in Cabo Delgado Province. This is further discussed in *Section 9.7.7*.

9.7.3 Manufacturing Industry

The manufacturing sector in Cabo Delgado Province is underdeveloped and concentrated in the city of Pemba and the Montepuez and Mueda districts, which together account for 58 percent of all manufacturing ventures in the province. The majority of manufacturing industries are small-scale operations intended for domestic markets. Industries include maize processing, salt production, bread-making and furniture manufacturing. Industries that are export-oriented include the processing of cashew nuts and cotton (see *Table 9.6*).

In 2007/2008, several industrial enterprises discontinued their activities; in particular, the marble factory of Montepuez, along with some industrial units oriented for the production of furniture, processing of juices and dry fruit, and the processing of cashew, textiles and sisal (1) (Government of the Province of Cabo Delgado, 2010c).

(1) The main factors that negatively influence the development of industry in Cabo Delgado Province are the lack of skilled labour, a not-enabling business environment for private operators, lack of supply of goods and associated services and the malfunction of infrastructure, such as the port, and water and energy distribution (Government of the Province of Cabo Delgado, 2010c).

Table 9.6 Industrial Production in Cabo Delgado Province, 2010

Product	Unit	Production
Corn flour	Tonnes	251,752
Salt	Tonnes	13,150
Bread	MZN	72,530,000
Cashew nuts	Tonnes	332
Furniture	MZN	10,250

Key:
MZN: New Mozambican Metical.

Source: Government of the Province of Cabo Delgado, 2010b.

9.7.4 Trade and Exports

Trade in Cabo Delgado Province is not well developed. In 2010, there were 1,466 urban shops and 292 wholesalers, primarily located in Pemba, in the three other municipalities of Montepuez, Mueda and Mocímboa da Praia and in the District centres. In the rural areas, trade and commerce is supported by 960 rural shops and 4,269 rural informal traders and street vendors (Government of the Province of Cabo Delgado, 2010c).

The province is one of Mozambique's main exporters of cotton (raw and seed) and timber (logs and milled timber). In 2009, timber and cotton seed exports yielded 599,722,724 New Mozambican Metical (MZN) (Government of the Province of Cabo Delgado, 2010a). In 2010, the value of the provincial exports increased by 18 percent to 710,829,756 MZN, due to exports of raw cotton and timber. *Table 9.7* shows the volumes of products exported in 2009.

Table 9.7 Provincial Exports in Cabo Delgado Province, 2009

Product	Unit	Quantity Exported
Timber (sawed wood)	m^3	32,908
Timber (wood in logs)	m^3	5,742
Precious stones	kg	17.73
Sea cucumbers	Tonnes	11.88
Cotton seed	Tonnes	10,425
Raw cotton	Tonnes	7,437
Shells (1)	Tonnes	36
Cashew nuts	Tonnes	5.5
Lobster	Tonnes	2

Source: Government of the Province of Cabo Delgado, 2010b.

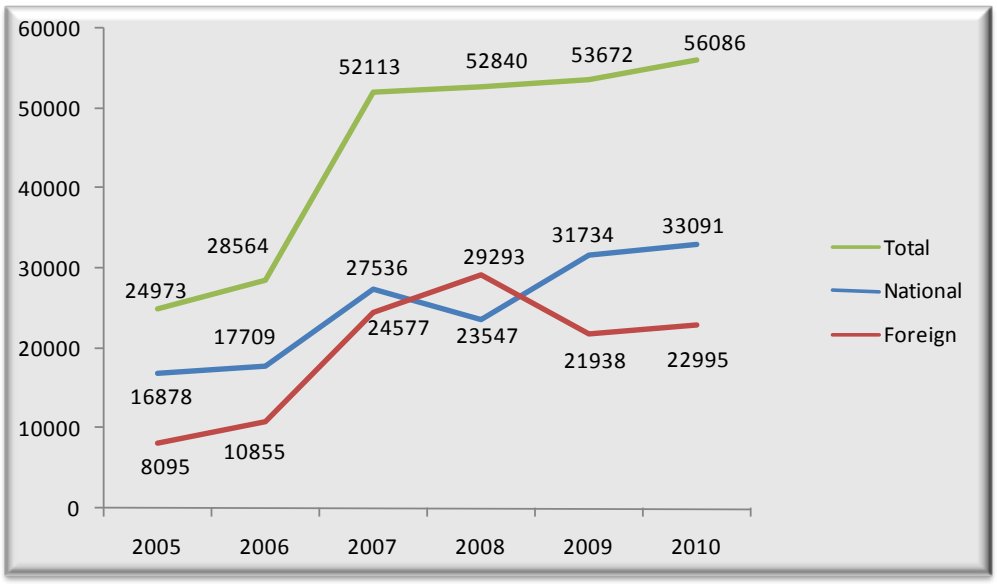
(1) Some shells exported are for ornamental objects, and others as raw material for the construction and garment-related industries.

9.7.5 *Tourism*

Tourism is an important contributor to the provincial economy and has potential for expansion. In 2010, this sector contributed 7 percent to the provincial economy, as well as generating 10 percent in tax revenue. Between 2005 and 2010, the number of national and foreign guests in local hotels and guest houses grew by 125 percent (from 24,973 guests in 2005 to 56,086 guests in 2010) (Government of the Province of Cabo Delgado, 2010a; 2010d). *Figure 9.6* shows that the number of national tourists dropped between 2007 and 2008, but has experienced steady growth until 2010. The number of foreign tourists grew by 269 percent between 2006 and 2008, but decreased between 2008 and 2009 due to the global financial crisis. The sector started showing signs of recovery again in 2010, as shown in *Figure 9.6*.

The tourism sector's growth potential is limited by the lack of high-quality accommodation facilities. An estimated 74 percent of accommodation in the province is of low quality (rated one to two stars). Domestic and international business travellers generally make use of three to five-star establishments, in particular those based in Pemba. The four and five-star facilities are mostly located on the islands of the Quirimbas Archipelago and Pemba City (1). These facilities are used by high-income international tourists seeking a remote and pristine environment. The four and five-star facilities represent 12.5 percent of all hotel and lodgings in the province, but they account for 27 percent of all beds in the province (see *Table 9.8*).

Figure 9.6 National and Foreign Tourists in the Province, 2005–2010



Source: Government of the Province of Cabo Delgado, 2010a; 2010d.

(1) Out of the nine tourist establishments in the province classified with four and five stars, two are in the city of Pemba and seven in the Quirimbas Archipelago (two in Palma District).

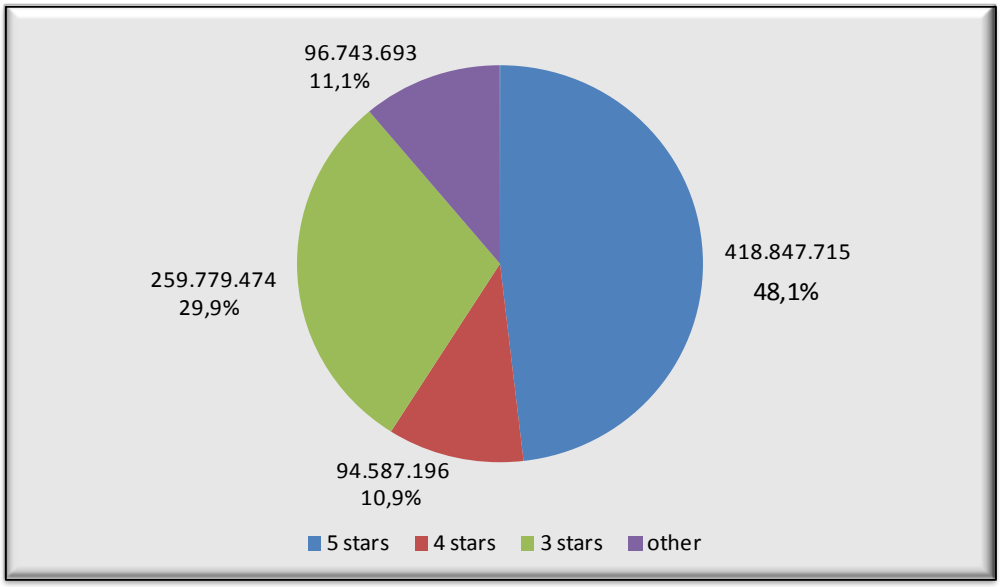
Table 9.8 Tourism Accommodation in Cabo Delgado Province, 2008–2010

Classification	Establishments/ Beds	2008	2009	2010	
				No.	%
Five stars	Establishments	2	2	4	5.6
	Beds	234	234	288	20.1
Four stars	Establishments	4	4	5	6.9
	Beds	74	74	97	6.8
Three stars	Establishments	8	9	10	13.9
	Beds	298	304	338	23.6
Less than three stars	Establishments	47	51	53	73.6
	Beds	602	630	709	49.5
Total	Establishments	61	66	72	100.0
	Beds	1,208	1,242	1,432	100.0

Source: Government of the Province of Cabo Delgado, 2010a; 2010d.

Until 2010, investment in tourism facilities accounted for 869,958,078 MZN, of which 59 percent were made by four and five-star establishments (*Figure 9.7*). Between 2008 and 2010, employment in the sector grew 47 percent as a result of the increased number of establishments during this period.

Figure 9.7 Structure of Investment in Tourism in Cabo Delgado Province, 2010



Source: Provincial Directorate of Tourism of Cabo Delgado, 2011.

In order to grow the tourism sector further, the Government developed the Strategic Plan for Tourism Development in Mozambique (2004–2013). The aim of the plan is to prioritise tourism activities, define products and markets, identify Priority Areas for Tourism Investment (PATIs) and evaluate the tourism resource base and the potential role of conservation for tourism. In Cabo Delgado Province, two PATIs were identified:

- PATI Type A/B of Pemba–Quirimbas; and
- PATI Type B of the Northern Coast of Cabo Delgado (1).

These areas are illustrated in *Figure 9.8*. The Northern Coast of Cabo Delgado PATI includes the Palma District, and has the following key interests that can be developed into tourist attractions:

- culture (art and crafts, dance and other cultural expressions);
- ecology (fauna, flora and forest diversity);
- landscape beauty [Rovuma Bay, Quionga lighthouse, Palma Bay, islands (see *Section 9.3*, Footnote 3), lagoons of Nangade and Lidede, and lowland areas of Palma District];
- water sports (recreational fishing and diving); and
- land-based sports (photo safaris, hunting, fresh-water fishing and canoeing).

(1) The Strategic Plan for Tourism Development in Mozambique (2004-2013) defines PATI A/B as *"destinations with a limited level of tourism development"* and PATI B as *"destinations with a high tourist potential, although undeveloped"*.

37°0'0"E 37°30'0"E 38°0'0"E 38°30'0"E 39°0'0"E 39°30'0"E 40°0'0"E 40°30'0"E 41°0'0"E

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TANZANIA

NIASSA

CABO DELGADO

NAMPULA

Mecula
Mavago
Marrupa
Majune
Maúa
Nipepe
Mueda
Montepuez
Balama
Namuno
Meluco
Ancuabe
Chiúre
Macomia
Muidumbe
Quissanga
Mocimboa da Praia
Nangade
Palma
Pemba
Metuge
Mecufi
Memba
Namapa

Palma
Nangade
Mocímboa da Praia
Mueda
Muidumbe
Macomia
Ibo
Quissanga
Meluco
Ancuabe
Pemba
Metuge
Montepuez
Balama
Chiúre
Mecúfi
Namuno

Legend

- District Centre

Roads

- Primary
- Secondary
- Tertiary

- Afungi Project Site
- Boundary with Tanzania

Province

- Cabo Delgado
- Niassa
- Nampula

- District Boundary
- Palma District

- Quirimbas National Park

- Provincial Government Plan - 2009 - 2013
- Priority Areas for Tourism Investment 2004 - 2013 Plan
- Priority Areas for Tourism Investment - Arco Norte Project - 2006 - 2010

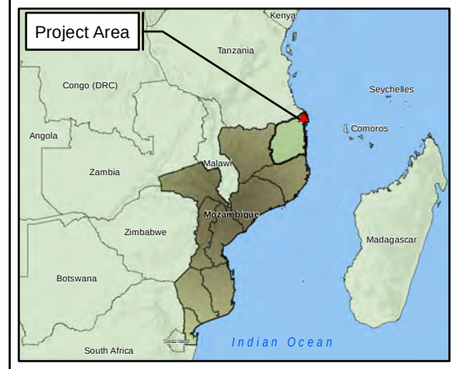

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Figure 9.8: Priority Areas for Tourism Investment in Cabo Delgado Province

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 1 600 000

DRAWING: Priority Areas for Tourism.mxd

REV: A

ERM
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Impacto Projectos e Estudos Ambientais

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Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

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9.7.6 *Fisheries*

Small-scale Fisheries

Small-scale fisheries is the only subsector of fisheries industry activities contributing to the economy of the province. Other fisheries subsectors are active south of the province and, in terms of commercial activities, industrial tuna fishing takes place beyond 12 nautical miles with no direct contributions to the provincial economy (1).

Small-scale fisheries and fishing industry-related activities are an important part of the provincial population's livelihood activities, especially for those living on the coastal areas – even though its contribution to the provincial economy is low at 6.4 percent. The majority of small-scale fisheries participants are artisanal subsistence fishermen who fish for household consumption (thereby playing an important role in food security for those involved) and sell the surplus locally. Only a small number of artisanal fishermen are more market-oriented, using more appropriate boats, technology and labour.

As shown in *Table 9.9,* small-scale fisheries involve 32,392 fishers, with a gender breakdown of 76 percent male and 24 percent female participants (National Survey of Small-Scale Fisheries, 2007). Of the artisanal fishers, 44 percent fish use boats, 29 percent fish without boats, 22 percent are collectors (eg of shellfish) and five percent are diverse (2). As previously mentioned, most of the small-scale fishing is undertaken for the purpose of household consumption, and surplus is usually sold to neighbours and at local markets. Some of the major challenges facing artisanal fishers seeking to be more market-oriented are a poor road network for marketing the fish, and a lack of refrigeration for the transportation of fresh produce. Accordingly, most fish is dried or smoked as a means of preservation.

The traded fish catches recorded in 2010 were 2,598t – a growth of 17 percent compared with 2009 (see *Table 9.10*) (Portal of the Government of Cabo Delgado a/b/d). According to the Fisheries Research Institute (3), catches in Cabo Delgado have grown from 11,558t in 2009 to 18,059t in 2011, partially because two additional fishing gears (4) were monitored in 2011. Thus, catch levels by artisanal fishers that use fishing gear in the province seem to be relatively stable during this period, despite more steady growth in the use of beach seine nets (from 5,909t in 2009 to 7,033t in 2011) and surface gill nets (from 2,582t in 2009 to 3,586t in 2011). Statistically, handline fishing remains the fishing gear with a higher fish effort and lower catch rate (13kg/day),

(1) *Section G2* of *Annex G* provides an overview of the legal framework and government legal approach and strategy for the fisheries sector, focusing specifically on the Small-Scale Fisheries Subsector.
(2) These are the four main categories of fishermen identified by the Small-Scale Fisheries Subsector (National Survey of Artisanal Fisheries, 2007).
(3) The Fisheries Research Institute (IIP) is the national institution responsible for estimating catches, fish effort and capture rates for each fishing gear.
(4) Fishing gear refers to the fishing equipment used (eg seine net, handline).

while encircling gill nets/surrounding pursing nets present a higher catch rate (144kg/day).

Table 9.9 Number of Small-scale Fishers in Cabo Delgado Province

	Men	Women	Men/Women
Total	**24,609**	**7,783**	**32,392**
Fishers with boats	**14,209**	**52**	**14,261**
Permanent	12,666	34	12,700
Occasional	1,543	18	1,561
Fishers without boats	**5,660**	**3,801**	**9,461**
Handline	2,479	16	2,495
Harpoon	1,796	1,082	2,878
Quinias/double stick net (1)	725	2,232	2,957
Gamboas/barrier (2)	470	448	918
Chicocota/stow net (3)	26	23	49
Tarrafa/handcast	164		164
Divers	**1,404**	**6**	**1,410**
Collectors	**3,336**	**3,924**	**7,260**

Source: National Survey of Small-Scale Fisheries, 2007.

Legend:
(1) Small-size net pushed by two persons.
(2) Vertical barrier fixed in the intertidal zone.
(3) Conic net/trap fixed in areas with current.

Table 9.10 Volume of Fish Sold Commercially in Cabo Delgado Province (2008–2010)

	2008 (t)	2009 (t)	2010 (t)
Total	**1,646**	**2,219**	**2,598**
Fish	1,124	1,452	1,507
Shrimp	87	111	131
Lobster	84	142	153
Crab	18	19	26
Sea cucumber	48	83	99
Oyster		79	91
Octopus and squid	195	219	425
Other	91	113	166

Source: Portal of the Government of Cabo Delgado a/b/d.

Industrial and Semi-industrial Fisheries

Cabo Delgado Province and the area where the Project is undertaking its activities in Area 1 and Area 4 has no nationally registered industrial and semi-industrial fishing activities. Nationally, industrial and semi-industrial fishers focus on shallow-water shrimp, deepwater shrimp and line fishing. These types of fishing are mainly confined to the south of latitude 16˚S, more than 440km from the southern limit of Area 1 and Area 4.

According to a report from the fisheries sector (Fenessy et al., 2011), in 2010 there were two industrial and 27 semi-industrial line fishing vessels targeting demersal fish (bottom fish) along the Mozambican coast. All these were national vessels, which reported a total catch of 626t in 2010. The catch comprised of slinger (*Chrysoblephus puniceus*), the seabreams (*Polysteganus coeruleopunctatus*, *Cheimerius nufar*), king mackerel (*Scomberomorus commerson*), groupers (*Epinephelus* sp. and others) and grunters (*Pomadasys kaakan*), among other demersal and pelagic fish species. The industrial and semi-industrial sector supplies both the domestic and southern African (mainly South African) markets. These fishers are based mainly in southern Mozambique, a considerable distance from Cabo Delgado Province and Palma District. However, some of these fishers occasionally operate in Area 1 or adjacent to it (in areas such as Beira and Quelimane, and occasionally Angoche in Nampula Province). In addition, there may be some sporadic line fishing north of latitude 16˚S, but this is normally limited to water depths of 25 to 200m (Almeida, 2005; Impacto, 2008).

Commercial Tuna Fisheries

The Indian Ocean accounts for 24% of the annual production of tuna in the world, and is considered as the second most important fishing zone worldwide, after west and central Pacific Ocean (ADNAP, 2013). The western region of the Indian Ocean (including Mozambique) is responsible for approximately 80% of all tuna catches in the Indian Ocean (ADNAP, 2013).

The Indian Ocean Tuna Commission (IOTC) (1) is an intergovernmental organisation created within the context of Article XIV of the Food and Agriculture Organisation constitution, of which Mozambique has recently become a member. Its mandate consists of managing tuna population units and others of the tuna family *(Thunnidae)* of the Indian Ocean and adjacent zones (Impacto, 2009). There are over 8,000 tuna fishing boats authorized and registered under IOTC (ADNAP, 2013).

Industrial tuna fishing is permitted along the coast east of Cabo Delgado where Area 1 is located, under the framework of the fisheries partnership agreement between the European Union (EU) and the Republic of Mozambique. Under the agreement, 75 EU vessels are allowed to fish off the coast of Mozambique within the EEZ but beyond the 12 nautical mile limit (approximately 21.6km) (*Figure 9.9*). This commercial activity has little impact on the Cabo Delgado economy, as the licences are issued by the Ministry of Fisheries at central government level and the catches remain offshore. The countries covered under the terms of the protocol include Spain, Portugal, France, Italy and Greece, and the main species caught by the EU vessels is tuna. The agreement sets a quota for catches by EU boats of 10,000t of fish per

(1) Contracting parties to the IOTC: European Union, Australia, China, Comoros, Eritrea, Philippines, France(*), India, Iran, Japan, Madagascar, Malaysia, Mauritius, Oman, Pakistan, Kenya, United Kingdom(*), Republic of Korea, Seychelles, Sri Lanka, Sudan, Thailand and Vanuatu.
(*) Representing their overseas territories that exist in the region.

annum. Additionally, two other contracts have been signed with tuna associations from Europe and Japan, benefiting 50 vessels (ADNAP, 2013). Commercial fishing therefore takes place under this agreement within the eastern portion of the Area 1. Historically, however, commercial fishing efforts in Area 1 are low compared to the fishing activities in deeper waters further east (Impacto, 2010). Half of the EU fleet comprises longliners and the other half are purse-seiners. Logbook data provided by the EU fleet to the Fisheries Administration of Mozambique show that vessels operate in Mozambique's EEZ four months per year on average. During the remainder of the year, vessels operating in the EEZ are from countries in the West Indian Ocean region, including Mauritius, Madagascar, Seychelles and Comoros. This is due to the fact that tuna is a migratory fish species and fleets pursue stocks through several EEZs.

In 2012 the Mozambican government granted tuna fishing rights in the 12 miles of its territorial waters and the 200 miles of its exclusive economic zone to the Oceanfresh Seafood Division, a subsidiary of British group Lonrho. The concession has been granted for a period of five years, during which Oceanfresh Seafood Division is authorised to catch 12,000 tons of tuna per year.

According to a report (Impacto, 2008), when the vessels are present in the EEZ, their location depends on the position of the concentrations of target species. This is influenced primarily by the location and abundance of food resources such as small pelagic fish, cephalopods and pelagic crustaceans (Potier et al., 2004). In Mozambique, there is evidence to suggest that the location and abundance of target food resources changes dramatically from year to year. *Figure 9.10* shows the distribution of fishing by the tuna fleet in the Mozambique EEZ, including areas adjacent to Area's 1 and 4.

36°0'0"E 37°30'0"E 39°0'0"E 40°30'0"E 42°0'0"E

10°30'0"S 12°0'0"S 13°30'0"S 15°0'0"S

TANZANIA

CABO DELGADO

NIASSA

NAMPULA

ZAMBEZIA

Legend

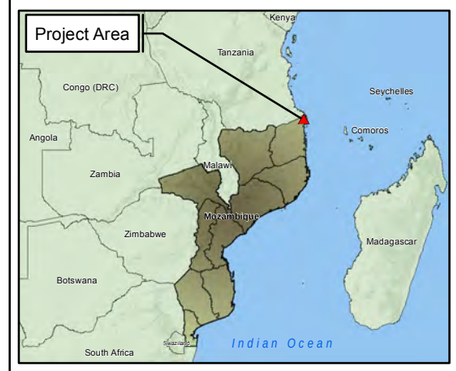
- Afungi Project Site
- Boundary with Tanzania

Province

- Cabo Delgado
- Niassa
- Nampula
- Zambezia

- Area 1
- Area 4

- Permitted Fishing Areas for EU Vessels
- Exclusion Zone



MAIN MAP SCALE:

0 20 40 60 80 100

Kilometers

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Figure 9.9: Industrial Fishery Zone where EU have rights to fish in Mozambique

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 2 500 000

DRAWING: European Union's Industrial Fishery Zone.mxd

REV: A

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Tel: +27 21 681 5400
Fax +27 21 686 073

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Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS, Impacto, 2012.
Inset Map: Esri Data & Maps

SIZE: A3

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39°30'0"E
40°0'0"E
40°30'0"E
41°0'0"E
41°30'0"E
10°30'0"S
11°0'0"S
11°30'0"S
12°0'0"S

TANZANIA

ROVUMA ONSHORE
(AMA1)

AREA 1
(AMA1)

AREA 4
(Eni)

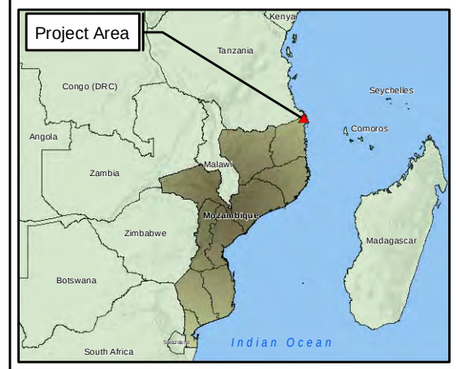
CABO DELGADO

Legend

- Artisanal Fishing Grounds
- Tuna Fishing Grounds (industrial purse-seiners and longliners)
- Concession Areas
- Afungi Project Site
- Boundary with Tanzania

Province

- Cabo Delgado



MAIN MAP SCALE:

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Figure 9.10:
Distribution of Tuna Fishing Vessels in relation to the Project Area

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 800 000

DRAWING: Distribution of Tuna Fishing Vessels.mxd

REV: A

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Rondebosch, 7725
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Impacto Projectos e Estudos Ambientais

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Projection: UTM Zone 37 S Datum: WGS84
Source: DIV-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

SIZE: A3

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Catches in 2009 and 2010 were estimated at 3,000t per year (*Table 9.11*), which represents a decrease of 54 percent in comparison to 2008 catches (6,549t). The bulk of the tuna catch (60 to 80 percent) comprises yellow fin (*Thunnus albacares*) and skipjack (*Katsuwonus pelamis*), similar to global statistics. The remainder of the catch includes other tuna species, shark and marlin. All tuna caught in Mozambican waters is sent to export markets through transhipment operations carried out at sea or in ports of the Seychelles and Mauritius, and therefore do not enter Mozambique.

Table 9.11 Tuna Catch Estimates for the International Fleet Operating in Mozambique in 2009 and 2010

Species	Catch 2009 (t)	2009 (%)	Catch 2010 (t)	2010 (%)
Albacore	100.4	3	86	3
Bigeye	168.8	5	134	5
Yellowfin	805.4	26	1,024	35
Skipjack	1,844.1	60	764	26
Others	168.3	5	933	32
Total	3,087.0	100	2,941	100

Source: Compiled from National Fisheries Administration database (ADNAP).

Other Industrial Fisheries

Deepwater shrimp fisheries are located approximately 600km from Area 1and Area 4, in the Sofala Bank, which begins on the coast near Angoche in Nampula Province, and extends to the Save River south of the city of Beira, on the border between Sofala and Inhambane provinces. These fishers catch between 800 and 1,000t of shrimp per annum, while the shallow-water shrimp fishers catch an average of 5,000 to 8,000t per annum.

At the moment, there is no tuna processing industry in the country and all benefits only come from fishing licenses taxes. Recognizing the importance of tuna fishing for Mozambique and aiming at maximizing the benefits for the country, the Council of Ministers approved The *Plano Estratégico de Desenvolvimento da Pescaria de Atum em Moçambique* (PEDPA) (Strategic Development Plan for Tuna Fisheries), on July 2013 in their 22nd Ordinary Session (See *Annex G, Section G1.3*). Some of the key actions of this strategic plan include:

For the small-scale fisheries:

- Directing semi-industrial and artisanal fisheries to the catching of tuna and similar species.
- Establishment of fishing gear appropriate for tuna.
- Promotion of the consumption of fresh tuna and its by-catch.
- Development of tuna storage and processing infrastructures.

For industrial fisheries:

- Establishment of a local industry to process tuna, in the main ports of Mozambique (such as Nacala for the purse seiners and Maputo for the longliners), which would also contribute with taxes from exportation.
- Promotion of the use of local ports for transhipment and off-load , using part of the catch for local consumption.
- Promotion of the consumption of fresh tuna and its by-catch.
- Promotion of a national industrial tuna fleet or international fleet based in Mozambique.
- Make it compulsory to off-load part of the tuna by-catch in the national ports.

9.7.7 Exploration and Production of Hydrocarbons

Between 2005 and 2006, the Government of Mozambique started creating concession blocks for onshore and offshore hydrocarbon exploration in the Bacia do Rovuma (Rovuma Bay). Since then, several international companies have conducted seismic surveys in many of the blocks (see *Figure 9.11*), which have identified significant natural gas reserves.

To date, the positive effects of hydrocarbon exploration and production in the country, on the economy, have been mostly observed at a central government level where applications for permitting for various activities and for payments are directed. *Table 9.12* below summarises the types of fees required by companies undertaking reconnaissance and exploration activities in the minerals, petroleum and natural gas sectors in different development phases of a project. These include the breakdown of licence fees, production fees (royalties) and other taxations (EITI – the Extractive Industry Transparency Initiative, 2008).

Table 9.12 Relevant Taxes and Fees Required for Mineral and Hydrocarbon Exploration and Production Company Activities to the Government of Mozambique

Payments	Mineral Sector	Oil and Gas Sector
Licence fee	Reconnaissance	Reconnaissance
	Prospecting and surveying	Exploration
	Mining concession	Oil and gas pipelines
	Mining certificate	
Surface tax	Depending on area	N/A
Royalty	3–10%	Gas: 6%
		Oil: 10%
Taxation on profit (IRPC)	-	32%
Taxation on contracted labour (IRPS)	Variable	Variable
Dividends	If government is a shareholder	If government is a shareholder

Source: EITI, 2008.

Table 9.13 below presents the contribution of large-scale mineral, petroleum and hydrocarbon development projects to the total revenue in Mozambique. Between 2008 and 2011, the revenue generated from exploration and other resource development-related activities increased from 2,144.3 to 2,803.3 million MZN (Bank of Mozambique, 2009; 2010; 2011). Most important to note is that contribution of the oil and gas sector within the megaprojects contribution has increased substantially, from 8.2 percent in 2008 to nearly 30 percent in 2011.

Table 9.13 Contribution of Megaprojects to National Revenue 2008–2011

	2008		2009		2010		2011	
	Million MZN	**%**	**Million MZN**	**%**	**Million MZN**	**%**	**Million MZN**	**%**
Energy production	455.4	21.2	786.0	50.5	1,374.5	45.4	778.4	27.8
Oil and gas exploration	176.6	8.2	133.6	8.6	833.8	27.6	836.1	29.8
Mineral resources exploration	965.2	45.0	233.7	15.0	341.4	11.3	746.1	26.6
Other	547.2	25.5	404.5	26.0	476.4	15.7	442.7	15.8
Total megaprojects	**2,144.3**		**1,557.8**		**3,026.1**		**2,803.3**	
Total country	**39,190.1**		**47,565.0**		**63,566.1**		**81,119.2**	
Megaprojects contribution (%)	**5.5**		**3.3**		**4.8**		**3.5**	

Source: Bank of Mozambique.

This data is not separated according to the relevant contributors (eg licences, royalties, taxation) through all period reported, or to the revenue distribution that took place at provincial government level.

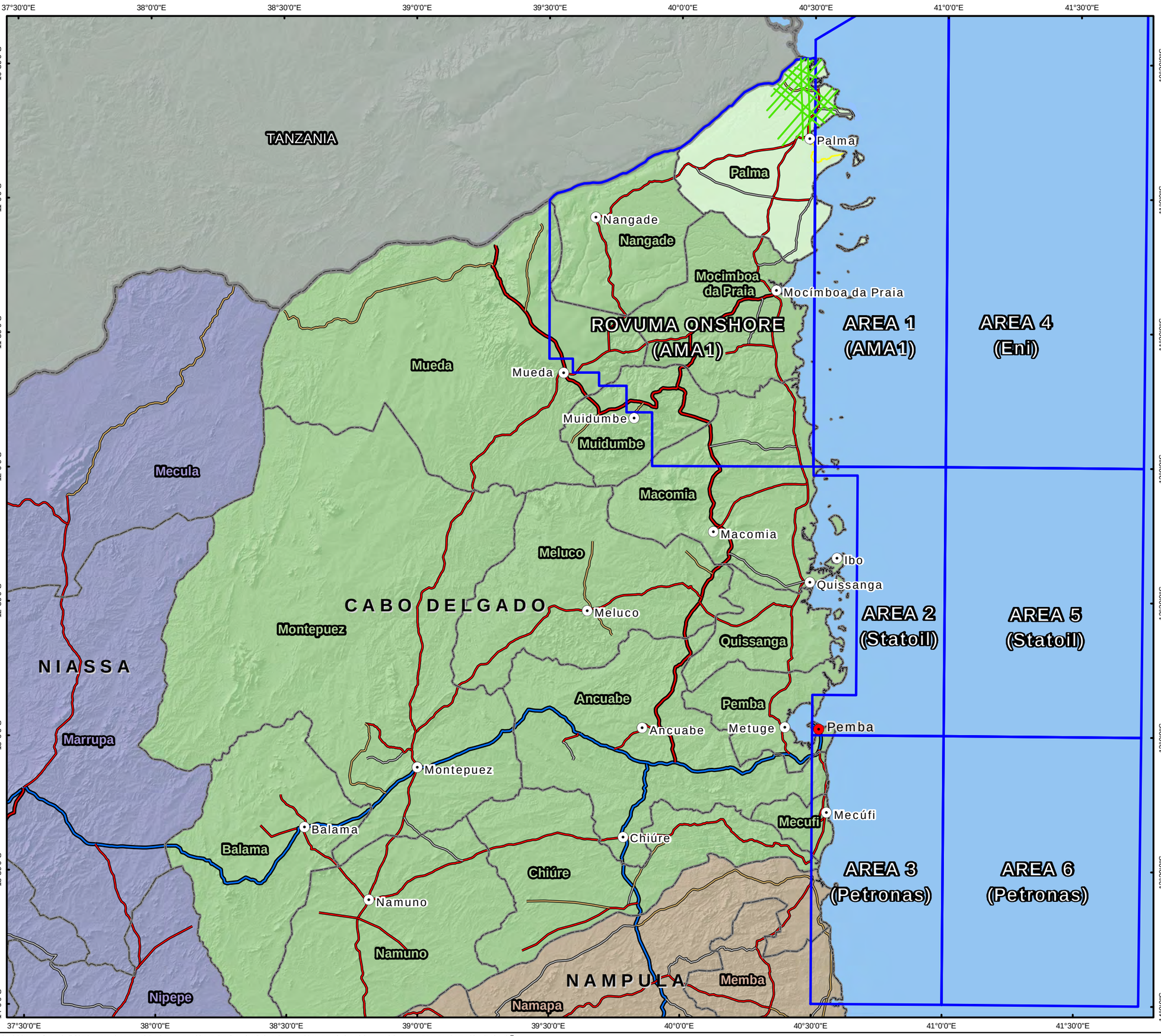
At provincial level, the effects are felt in some sectors providing services to ongoing petroleum and hydrocarbon exploration activities, such as the port and airport of Pemba, cargo transporters, wholesaler suppliers (food, fuel and other) and tourism operators (accommodation and restaurants) (1).

According to the International Monetary Fund (IMF), the contribution of the megaprojects to the growth of the national added value (2) between 2003 and 2010 was 4 percentage points (IMF, 2011). It is estimated that between 2013 and 2015, the growth will range from 8 to 11 percent, a 3 percent increase due to megaprojects (3).

At a District level, the positive effects of hydrocarbon and petroleum exploration and development activities occur primarily through the procurement of local goods and services in both the Palma District and the northern Cabo Delgado region. Employment opportunities to date have

(1) In its 2010 annual report, the Government of Cabo Delgado identifies a growth of 253% in the movement of ships in the Port of Pemba, due to oil and gas activities (Portal of the Government of Cabo Delgado).
(2) National added value is defined as the difference between the gross product of a sector of activity and the cost of its intermediate factors.
(3) Megaprojects considered by IMF analysis were the production and distribution of electricity, aluminum production, natural gas extraction, coal extraction, and other mining projects.

largely been focused on unskilled casual labour for onshore exploration activities and some activities supporting Afungi Project Site activities. The Project has been careful to ensure that employment opportunities have specifically targeted men and women from communities directly impacted by Project activities.



Legend

- District Centre
- Capital City of Cabo Delgado
- Seismic Line

Roads

- Primary
- Secondary
- Tertiary
- Local
- Non Classified

- Concession Areas
- Afungi Project Site
- Boundary with Tanzania

- District Boundary
- Palma District

Province

- Cabo Delgado
- Nassa
- Nampula

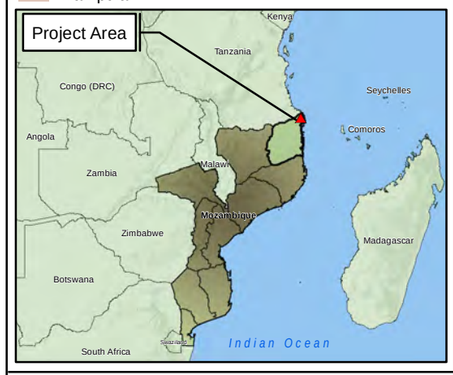


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Figure 9.11:
Blocks in Rovuma Basin established for Hydrocarbon Exploration & Production

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 1 500 000

DRAWING: Blocks in Rovuma Bay.mxd

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Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

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9.8 PALMA DISTRICT POLITICAL AND ADMINISTRATIVE ORGANISATION

9.8.1 Palma District

Mozambique is politically and administratively divided in 11 provinces, and each province into districts. The Government of Mozambique follows this geographical division with a central government based in Maputo comprising different sector ministries, as well as a provincial government based in each province capital, which also comprises different sector provincial directorates.

Palma District is located in the north-east of Cabo Delgado Province, as shown in *Figure 9.1*. The District is bordered by the Rovuma River to the north (which also forms the border with Tanzania), Nangade District to the west, Mocímboa da Praia District to the south, and the Indian Ocean to the east.

Palma District is comprised of four Administrative Posts, six Localities and several villages, as outlined in *Table 9.14* and illustrated in *Figure 9.2*. The Afungi Project Site falls within the Palma Administrative Post and Mute Locality (1). The District's administrative area extends to the nine islands (2) off the coast of the District, each of them belonging to an Administrative Post (depending the island's geographical position).

Table 9.14 District of Palma Administrative Posts and Localities

Administrative Posts	Localities
Palma	Palma-Sede, Mute
Olumbe	Olumbe-Sede, Quissengue
Pundanhar	Nhica do Rovuma
Quionga	Quirinde

The Palma District's present political and administrative structure is a result of the decentralisation process started by the Government of Mozambique in 2000, which reorganised the State at local level (3) and began the integration of community authorities in the local political organisation. *Annex G* provides some historical context and background information about this political and administrative organisation; in particular, the community organisation and the legal framework.

Figure 9.12 illustrates the political and administrative organisation structure of Palma District, considering the levels of the territory (from the District down to the village level) and the different structures and representatives involved

(1) The mapped boundaries of the Administrative Posts of Palma and Olumbe do not match the actual boundaries. The database used for preparing maps comes from an official source (CENACARTA) but, in the case of these two Administrative Posts, there are discrepancies when compared to the actual boundaries, as observed during the Social Assessment and confirmed by District authorities. There are no signs that these discrepancies correspond to disputes between the two Administrative Posts.
(2) Four are considered to be 'big islands' (Tecomaji, Rongui, Vamizi and Metundo), and five are 'small islands' (Quifuqui, Queramimbi, Quissingula, Vumba and Suavo).
(3) Law No. 8/2003 of the Local State Bodies – LOLE, Decree No. 11/2005, Regulation of the LOLE, and Decree No. 11/2012, which revises Law No. 8/2003 dated 19 May. Also note that except for the Mayors of the Municipalities, who are elected, the other bodies of local government are appointed in accordance with the rules of the State apparatus.

in district-level government administration (government/state bodies/community and consultative authorities) (1).

Figure 9.12 Political and Administrative Organisation of Palma District

Level of Territory	Government	State Apparatus	Community Authority	Civil Society Community Management	Consulting Structure
District	Administrator Permanent Secretary District Services Directors	Administrator Office District Secretariat District Services			District Consulting Council
Administrative Post	Chief of Administrative Post	Administrative Secretariat		Local Forums	Administrative Post Consulting Council
Locality	Chief of the Locality	Administrative Secretariat		Community Comitees	
Village	Chief of Village	Administrative Council	Village Leader (3rd level). Assistant to Village Leader Chiefs of Zones	Comunity Comittees	

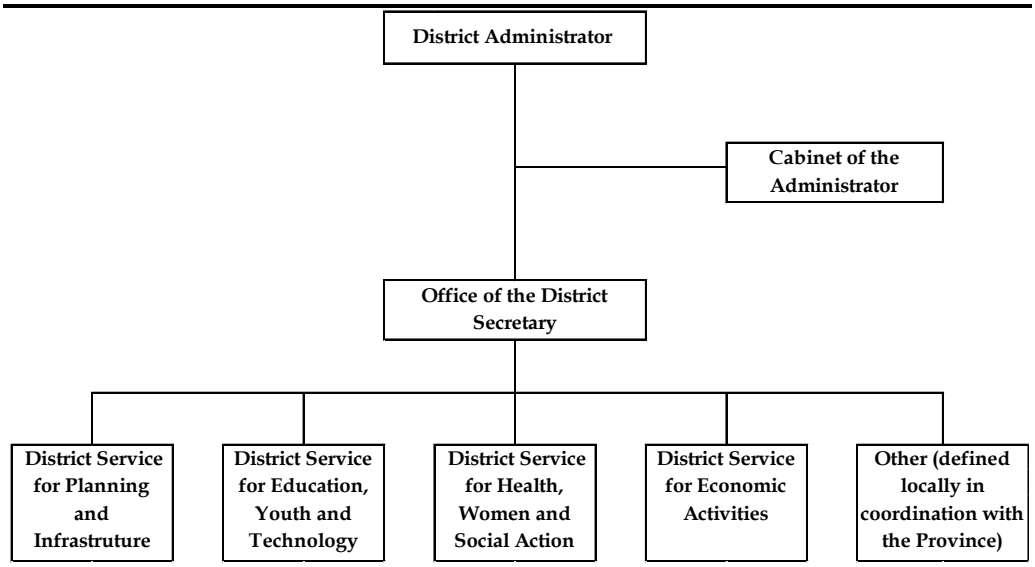
Source: Impacto, 2012.

The District is headed by the District Administrator and supported by a Permanent Secretary and Directors of the District Services (*Figure 9.13*). The minimum number of directors assisting the District Administrator is four, including the Director of Planning and Infrastructure; Director of Economic Activities; Director of Education, Youth and Technology; and Director of Health, Women and Social Affairs. The organisation structure of the services that compose the District's administrative system is illustrated in *Table 1.4* in *Annex G*.

Until the publication of the Decree No. 11/2012, formal state authority at district level ended at the locality level, but it has since been extended to the village level through the appointment of Village Chiefs by the District Administrator. Mute Locality is currently managed by the Locality President, a position that existed prior to the approval of Decree No. 8/2003 and Decree No. 11/2005. Some of these positions are considered to be political and, therefore, there is a strong link (formal but not defined in legal terms) between the party in power and the four levels of local state government.

(1) Blank cells in the community authority structure mean that they apply in the case of Palma District, while in the case of the consulting structure they are not foreseen.

Figure 9.13 Structure of Governance in Palma District



Source: Impacto, 2012 (based on Decree No. 6/2006 approved by the Council of Ministers).

Below the district government level, formal governing structures comprise, in hierarchical order, Chiefs of Administrative Posts, Chiefs of Localities and Chiefs of Villages, each of which supersedes the administrative levels below them, as shown in *Figure 9.12*.

9.8.2 The Afungi Project Site and Surrounds (including Senga and Maganja)

At the time of the baseline surveys, there was no state authority based in the villages within the Afungi Project Site and Surrounds. Community authorities were represented by a Village Leader and assistant, as observed in Quitupo, Senga and Maganja villages. Each of these villages has some scattered settlements headed by a Chief of Zone, who reports to the related Village Leader.

9.9 PALMA DISTRICT AND AFUNGI PROJECT SITE: SOCIO-DEMOGRAPHIC INDICATORS OF THE AREA OF DIRECT INFLUENCE

9.9.1 Demographic Profile

Palma District

With a surface area of 3,576km^2 and a population density of 13.5 inhabitants/km^2, Palma District had a population of 48,318 inhabitants in 2007, representing 3 percent of the total population of Cabo Delgado Province. *Table 9.15* provides an overview of social indicators for Palma District. The most recent census data available is from the 2007 Census, published in 2010 by the INE.

Table 9.15 Socio-demographic Indicators of Palma District in 2007

	Palma District (%)	Cabo Delgado Province (%)
Number of persons per household	3.71	4.1
Women	50.1	51.6
Urban population	0.0	20.8
Rural population	100	77.6
Demographic density	13.5	19.4
Population growth 1997–2007	1.37	1.9
People aged 15+ not completing any education level	88.13	81.28
With electricity	0.6	3.3
Piped water	0.2	5.0
With a borehole, well or pump	27.6	24.8
With a septic tank with improved latrine	1.2	3.05

Source: Government of the Province of Cabo Delgado, 2010e.

In Palma District in 2007, women accounted for 50.1 percent of the population (INE, 2010e). The District is rural; the villages are small and subject to an insignificant degree of urbanisation, the only exception being Palma town, the District centre that in the past years has experienced some growth in the upper town along the national road (1). The average number of people per household was 3.71, which was lower than the average size of households throughout the province. This difference may be related to the rural character of the District; in rural areas, early marriage is common causing people to leave home at a young age (2) (*Sections 9.2.1* and *9.13.1* present more discussions on this matter).

Afungi Project Area and Surrounds (Including Senga and Maganja)

Based on the Household Survey undertaken in January 2012 as part of the Social Assessment, the average household size in the Afungi Project Site and Surrounds (including Senga and Maganja) is 4.1 persons. There are more women than men in the area (52.2 percent and 47.8 percent respectively). Wives are typically an average of 10 years younger than their husbands, reflecting early marriages among women. Approximately 91 percent of households have a male head of household, and only 9 percent have a female head of household. This is a low level of female representation when compared to the provincial level, where a female head of household accounts for 29 percent of households.

Table 9.16 presents a summary of some demographic indicators considered for the Afungi Project Site and Surrounds (including Senga and Maganja) and compares them with Palma District data from the 1997 Census.

(1) Nevertheless, in the 2007 Census, the INE considered Palma town as rural and classified the District as 100 percent rural.

(2) Throughout the fieldwork conducted in November 2011 and January 2012, the socio-economic team noted a number of initiation rites of young females, which mark their passage into adulthood.

Table 9.16 Socio-demographic Indicators of Surveyed Households in the Afungi Project Site and Surrounds (Including Senga and Maganja)

Indicator	Afungi Project Site and Surrounds (2012 Household Survey)	Palma District (1997 Census)
Average number of people in the household	4.14	3.71
Average number of men	1.98	1.85
Average number of women	2.16	1.86
Women (%)	52.20	49.90
Rural population (%)	100.00	100.00
Demographic density	38.30	13.50
Average age of head of household	47	-
Average age of wives	37	-
With electricity (%)		
With piped water (%)	0.00	0.00
With borehole, well or pump (%)	62.10	27.60
With septic tank with improved latrine (%)	0.00	3.05

Source: Impacto, 2012; INE (Palma District Census Data), 2010.

The population of the Afungi Project Site and Surrounds (including Senga and Maganja) is relatively young, with 39 percent of the population being under the age of 14 years. The remainder of the population (15+ years of age) accounts for 61 percent (*Figure 1.1* in *Annex G*).

9.9.2 Population Distribution

Palma District

The population of the District tends to be concentrated in the coastal areas (*Table 9.17* and *Figure 9.14*). Palma and Olumbe (south of Palma town), located on the coast, are the most populated Administrative Posts: 54 percent of the District population is located in Palma Administrative Post, with Olumbe the second-most populated at 26 percent.

In 2007, the Administrative Post of Palma had a higher population density than the District, with 28.6 residents/km^2 versus 13.51 residents/km^2 in the District in 2007, followed by Quionga with 10.4 residents/km^2, and Olumbe with 10 residents/km^2. The inland Administrative Post of Pundanhar had the lowest population density (4.2 residents/km^2) within Palma District. The larger concentrations of people occur in Palma town and the villages of Olumbe, Maganja, Quiwia and Quionga.

Table 9.17 Population Density by Administrative Post (2007)

District/ Administrative Post	Total Population	Surface Area (km²)	Population Density
District	48,318	3,576	13.5
Palma	26,073	921.6	28.6
Olumbe	12,549	1,251.3	10.0
Pundanhar	3,349	795.9	4.2
Quionga	6,347	609.3	10.4

Source: INE, 2010f.

The population of Palma District grew by 1.37 percent per year between 1997 and 2007, as shown in *Table 9.18*. This is lower than the 1.9 percent reported for the province. The growth rate of Cabo Delgado Province is impacted by the growth rates of urban areas, such as the City of Pemba and other municipalities within the province. According to the forecasts for 2012, the population is 41,438 inhabitants, corresponding to a growth of 1.26 percent between 2007 and 2012 – a slight decrease compared with the preceding period (INE, 2009g; 2010h) (1).

As illustrated in *Table 9.18*, population growth fluctuated in the Administrative Posts and in the respective Localities between 1997 and 2007 (2). In the Administrative Posts of Palma and Pundanhar, the growth was above the provincial average, at a rate of 2.4 and 3 percent respectively. For the Mute Locality, population growth was higher, at 3.5 percent. In the Administrative Posts of Olumbe and Quionga, growth was below average and even negative in the case of Olumbe (-0.4 percent). In the Locality of Quissengue, there was negative growth of 2.1 percent.

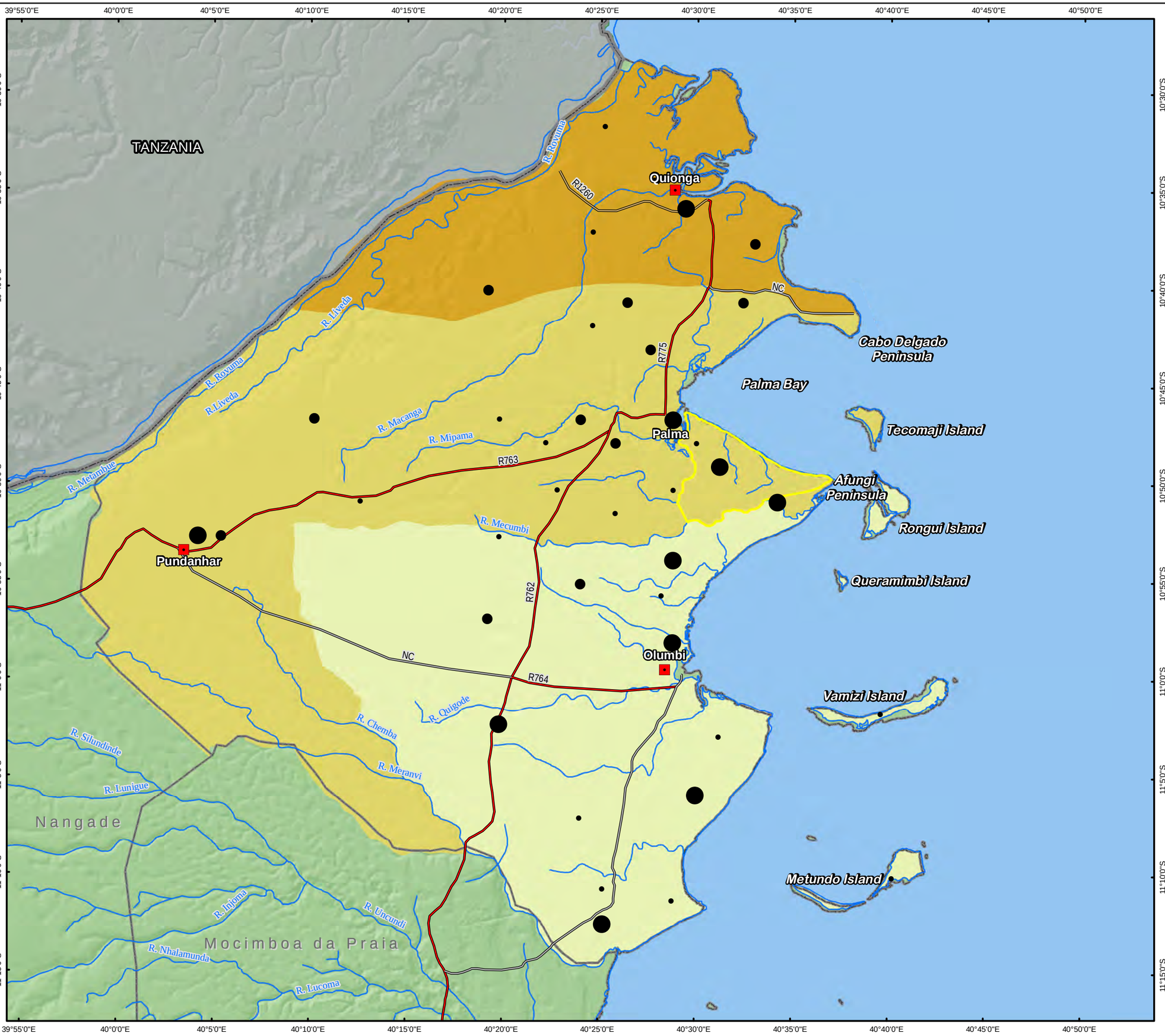
(1) The INE only provided the rate of growth projected for the period 2007 to 2012 for the District level. The population numbers projected for the year 2012 by Administrative Post and town were calculated by applying, in a linear manner, the rate of growth of 1.26 percent projected by the INE for the District.

(2) The existing information does not allow any analysis of the reasons explaining the variations between the Administrative Posts and towns. There are several factors that could explain the different growth rates.

Table 9.18 Population of Palma District (1997–2012)

Administrative Post	Locality	1997 Census			2007 Census				2012 Projection			
		Total	Men	Woman	Total	Men	Women	Growth Rate	Total	Men	Women	Growth Rate
Palma	Palma-Sede	13,131	6,635	6,496	15,673	7,664	8,009	1,8	16,685	8,308	8,377	
	Mute	7,395	3,651	3,744	10,400	5,133	5,267	3,5	11,072	5,513	5,558	
	Total PA	20,526	10,286	10,240	26,073	12,797	13,276	2,4	27,757	13,822	13,935	
Olumbe	Olumbe-Sede	7,315	3,543	3,772	7,598	3,691	3,907	0,4	8,089	4,028	4,061	
	Quissengue	6,140	3,259	2,881	4,951	2,784	2,167	-2,1	5,271	2,625	2,646	
	Total PA	13,455	6,802	6,653	12,549	6,475	6,074	-0,7	13,359	6,652	6,707	
Pundanhar	Nhica do Rovuma	2,489	1,277	1,212	3,349	1,631	1,718	3,0	3,565	1,775	1,790	
	Total PA	2,489	1,277	1,212	3,349	1,631	1,718	3,0	3,565	1,775	1,790	
Quionga	Quirinde	5,712	2,860	2,852	6,347	3,192	3,155	1,1	6,757	3,365	3,392	
	Total PA	5,712	2,860	2,852	6,347	3,192	3,155	1,1	6,757	3,365	3,392	
DISTRICT TOTAL		**42.182**	**21.225**	**20,957**	**48,318**	**24,095**	**24,223**	**1,37**	**51,438**	**25,614**	**25,824**	**1,26**

Source: INE, 2009g; 2010h.



Legend

- District Centre
- Administrative Post Centre
- Rivers

Roads

- Tertiary
- Local
- Non Classified

- Afungi Project Site
- Boundary with Tanzania
- District Boundary

Province

- Cabo Delgado

Population Density

- < 500
- 501 - 1000
- 1000 - 5000

Population Density (Hab/km²)

- 1 - 2
- 3 - 4
- 5 - 11

MAIN MAP SCALE:

0 5 10 15 20
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Figure 9.14: Population Distribution in Palma District

CLIENT: Anadarko Moçambique Área 1, Lda / eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
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DRAWING: Population Distribution in Palma District.mxd

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Locality of Mute

The Afungi Project Site is located in Palma Administrative Post in the Locality of Mute (1), south-east of Palma town (*Figure 9.2*). Mute Locality is composed of several villages, most of which are located along the R762 road (running from Mocímboa da Praia to Palma town). Other villages are located along the non-classified road, starting at the intersection of the R762 road and running in an easterly direction towards the village of Maganja, located on the coast, south-east of the Afungi Project Site (*Figure 9.15*).

Figure 9.2 shows the more important villages that are part of Mute Locality, although physical boundaries are not already mapped, as explained.

According to local authorities, in 2012 the population (2) of Mute Locality was approximately 16,473, representing roughly 32 percent of the District, as shown in *Table 9.19* below.

Mute Locality has the second-highest population in the District after the Palma-Sede Locality. The high growth of the population is attributed to migrants who started to settle in the Locality in the period 1997 to 2007, and continued thereafter. According to the local authorities, this in-migration is due to the agricultural and fishing potential in the area (3). At the time of the field baseline surveys, there were seven production zones (agricultural areas) that were home to a population of 3,447 people, including both permanent and seasonal residents (see *Table 9.19*).

Table 9.19 Population of Mute Locality

Mute Locality	**Census 1997**				**Mute Locality 2012**				**Main Languages Spoken**
	Total	**Men**	**Women**	**Households**	**Total**	**Men**	**Women**	**Households**	
Total	**6,906**	**3,405**	**3,501**	**1,847**	**16,473**	**7,937**	**6,536**	**4,607**	
Mute-Sede	927	453	474	240	3,681	1,597	2,084	657	Chimakonde
Quitupo	1,770	882	888	473	1,510	791	719	891	Makue, Kimwani
Senga	460	237	223	119	360	170	190	210	Chimakonde
Maganja	1,442	677	765	388	1,900	1,066	834	526	Kimwani, Makue
Macala	435	224	211	115	213	109	104		Makue
Muangaza	554	269	285	143	660	340	320	350	Chimakonde
Manguna	673	334	339	182	3,625	1,725	1,900	725	Makue
Matapata	355	191	164	102	945	470	475	144	Makonde
Nkalanga	290	138	152	85	132	60	72	77	Makue
Settlements in agriculture areas (production areas)					**3,447**	**1,609**	**1,838**	**974**	

(1) The administrative boundaries of Mute Locality (or any other Localities in the country) have not been mapped.
(2) For the purpose of this report, data provided by local authorities are used as they provide disaggregated data. However, it should be noted that the data are based on best estimates.
(3) Note that even people resident in villages and settlements relatively far from the coast (sometime up to 10km) can go to the coast to fish and come back after some time. This was evident during interviews held in Mute Locality, Quitupo and Senga.

Mute Locality	Census 1997				Mute Locality 2012				Main Languages Spoken
	Total	Men	Women	Households	Total	Men	Women	Households	
Total	**6,906**	**3,405**	**3,501**	**1,847**	**16,473**	**7,937**	**6,536**	**4,607**	
Zambia					35	16	19	19	No information
Nguco					1,420	700	720	172	No information
Nacache					42	21	21	20	Chimakonde
Namalala 2					400	190	210	237	Chimakonde
Patacua					223	111	112	70	Makue
Mapalangan ha					185	80	105	105	Chimakonde
Nkumbi					1,142	491	651	351	Chimakonde

Source: Data gathered at Mute Locality, as the 2007 Census does not have village level population data.

The Afungi Project Site and Surrounds

The Afungi Project Site is geographically located on the Afungi Peninsula and covers an area of 7,000ha. *Figure 9.15* shows the Afungi Project Site and Surrounds, which includes three villages – Quitupo within the Afungi Project Site, and Senga and Maganja in close proximity to the Afungi Project Site (at distances of 0.88 and 1.88km respectively) – included in the Household Survey carried out for the socio-economic baseline (see *Section 9.4.1*).

There are other smaller settlements, generally considered as belonging to the main villages, which were consulted and included during the village mapping and Household Survey activities (see *Figure 9.15)*. These settlements or areas comprise:

- **small scattered settlements located near agricultural areas** (1 where some households live on a permanent and/or a seasonal basis. Most of them are located around Quitupo Village, occupying highland areas located near lowland areas;

- **coastal settlements with fishing centres** (located on the coast), such as Milamba 1 and N´semo/Quibundju. In these settlements, some households reside on a permanent basis, engaging in agriculture and other activities such as informal trade and handicraft production, in some cases combining these activities with fishing. These settlements also happen to include a fishing centre (with permanent and seasonal fishermen and fish traders); and

- **fishing centres,** such as Milamba 2 and Ngodje. These specific fishing centres are mainly settlements of fishers, where fishers and fish traders live on a permanent or seasonal basis.

(1) As stated previously when describing the Mute Locality, those settlements are locally called production zones.

Table 9.20 below shows the main settlements and population distribution within the Afungi Project Site boundaries in 2012, estimated at 2,733 individuals who make up 743 households (1) - that is an estimated 38.3 persons/km^2 representing 5.3 percent of Palma District.

The population residing in the fishing centre of Ngodje, in the settlement with a fishing centre of Milamba and in the settlements near agricultural areas (production zones) belong administratively to the Village of Quitupo, while the population in the settlement with a fishing centre of N´semo/Quibundju and Patacua (production zone) are accounted for separately.

Table 9.20 Population Distribution in the Afungi Project Site

Residential Zone	No. of Permanent Residents	No. of Households
Village of Quitupo and scattered settlements (production zones)	1,022	273
Settlement with fishing centre of Milamba	488	130
Scattered settlement of Patacua (production zone)	223	70
Settlement with fishing centre of N´semo	1,000	269
Total	2,733	743

Source: Impacto, 2012, from village leaders.

(1) The number of households was recalculated using the average number of households observed in Quitupo, according to Census 1997 data, as the figure presented by the Mute Locality authorities for the number of households did not seem consistent. However, when cross-checking figures from Mute Locality with those provided by Quitupo Leaders, the number of total inhabitants matched the number provided by the Quitupo Village Leader.

40°30'0"E

40°35'0"E

10°50'0"S

Porto de Palma

Palma

Ngodje

Ngodje

Palma Bay

Milamba 2

Milamba1

Barabarane

Ntaunadje

Quitupo

Nambuimbui

Nacabande

Nsemo/Kibundju

Nfunzi

Afungi Peninsula

Quidjeri

Quitunda

Nsenga

Namacande

Maganja

Patacua

bing

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Legend

- Villages
- Settlement (production zone)
- Settlement with Fishing Centre
- Fishing Centre
- Local Roads
- Regional Roads
- Afungi Project Site

MAIN MAP SCALE:

0 1 2 3

Kilometers

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TITLE:

Figure 9.15:
Settlements in the Afungi Project Site and Surrounds (including Senga and Maganja)

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 52 000

DRAWING: Settlements in the Afungi Project Site and Surrounds.mxd

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Impacto Projectos e Estudos Ambientais

ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: Bing Maps ©2010 Microsoft Corporation.
Impacto, 2012. Inset Map: Esri Data & Maps

SIZE: A3

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9.9.3 Ethnolinguistic Groups

Palma District

Current INE/Census, Provincial or District-level data was unable to provide details on the languages spoken across the Palma District. However, the Social Assessment was able to identify the main languages spoken in villages that form part of Mute Locality (see *Table 9.21* above), and include Kiswahili, Kimwani, Cimakwe and Shimakonde (1).

Afungi Project Site and Surrounds (Including Senga and Maganja)

During the Household Surveys, ethnolinguistics in the Afungi Project Site and Surrounds were analysed based on the main languages spoken by heads of the household, and are presented in *Table 9.21.* The most dominant languages spoken are Cimakwé (54.3 percent), followed by Kimwani (20 percent) and Shimakonde (12.9 percent). A small portion of the population speaks Kiswahili (7.1 percent) and Emakhua (4.3 percent).

Table 9.21 Native Language of the Heads of Surveyed Households

Native Language	Quitupo (%)	Quitupo Settlements (Production Zones) (%)	Coastal Zone (%)	Senga (%)	Maganja (%)	Total (%)
Kiswahili	5.8	25.0	-	-	10.0	7.1
Kimwani	3.8	25.0	4.5	5.0	66.7	20.0
Cimakwé	86.5	37.5	86.4	10.0	13.3	54.3
Shimakonde	1.9	-		85.0	-	12.9
Emakhua	1.9	6.3	9.1	-	6.7	4.3
Other	-	6.3	-	-	3.3	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Impacto, 2012.

Each of the villages and settlements in the area can be characterised by their various ethnolinguistic groups, and are described below.

- **Quitupo Village and the Coastal Zone**: Cimakwé is the most dominant language (87 percent), followed by Kiswahili (5.8 percent) and Kimwani (3.8 percent). In the Coastal Zone approximately 9 percent of the households speak Emakhua, due to the migration of people into the area (permanently and seasonally).

- **In Quitupo Settlements (production zones):** 37.5 percent of the heads of households speak Cimakwé, but there are other groups found in large numbers, such as the Kiswahili and Kimwani (25 percent each).

(1) Note that the spelling of the name of the ethnic group and the language spoken is slightly different. Generally, the name of the language holds a prefix that corresponds to the article 'the' ('ki' for 'mwani' or 'Ci' for 'makwé', for example).

- **Senga Village**: the dominant language is Shimakonde (85 percent), followed by the Cimakwé (10 percent) and Kimwani (5 percent). This indicates in-migration of the Makonde group to the coast from the Mueda highlands, where this group is predominant (1).

- **Maganja Village**: the dominant language is Kimwani (66.7 percent), followed by Cimakwé (13 percent) and Kiswahili (10 percent). The latter are migrants from the northern coastal parts of Cabo Delgado Province (Palma and Mocímboa da Praia districts).

9.9.4 Migration Patterns

Palma District

There is no available documented data regarding migration patterns of the population within the District in terms of domestic and cross-border migration. The differential in growth between Administrative Posts and Localities between 1997 and 2007 discussed previously (*Section 9.8.2*) suggests movements of population within the District and with neighbouring districts.

There are historical and economic links between Palma District (and other northern districts of Cabo Delgado) and Tanzania, north of the Rovuma River. These links can be seen through some Tanzanian traders established in Palma town and the flow of traders and goods between the two borders, using the road from the Namoto Border Post and the sea between the northern districts of Cabo Delgado and Tanzania.

However, the District also serves as an entry point for immigrants, specifically for people entering the country via the Namoto Border Post, near the Rovuma River bordering with Tanzania. Once in Mozambique, immigrants destined for Mozambique typically stay inCabo Delgado Province or travel to Nampula and Zambézia provinces, where they participate in artisanal mining, or undertake onward travel to South Africa in search of work. There is evidence of irregular trade of goods and circulation of people by land and by sea, as not all movement is made through the Namoto Border Post and main roads, or from boat landings in or near Palma town, respectively.

The Rovuma River is the physical border between Mozambique and Tanzania, and the Namoto Border Post provides the only customs and immigration services in Palma District where authorities can control and document the migration of people and transportation goods (2).

(1) The Makonde group has a history of migration to the coast, both in past centuries and recent migrations, after independence. However, this Social Assessment did not study the migrations of the Makonde group. In the concrete case of Senga, results from the Household Survey and discussions from the focus group indicated that most of its inhabitants arrived after independence (1975) to work in the 'cooperatives of production' that the socialist-oriented Mozambican Government constituted in the Ngodje palm tree plantations abandoned by Portuguese owners, while a smaller group came after the peace agreement in 1992.
(2) The Unity Bridge, located in the north of Mueda District, is another point of entry from Tanzania, using the road network of Mueda District and giving access to the central region of Cabo Delgado Province and to some areas of Niassa Province.

Between the end of 2010 and July 2011, there was an unusual wave of political asylum seekers (approximately 18,000 individuals) who entered the Palma District. The asylum seekers originated from Ethiopia, Somalia, the Democratic Republic of the Congo and Burundi. In response, the central government (specifically the Ministry of Foreign Affairs) established an office in the Palma District to attend to and process these cases and forward them to the Refugee Centre of Marretane in Nampula Province (1). Information obtained from the Mozambican National Institute for the Support of Refugees (INAR) in Palma showed that, in most of the cases, the motivation for immigration to the region was economic and was only in some cases political asylum.

Afungi Project Site and Surrounds (Including Senga and Maganja)

Table 9.22 summarises the approximate duration the surveyed households have lived in the Afungi Project Site and Surrounds, showing that the majority are native to the area (approximately 60 percent) or long-term migrants (13.6 percent) who settled in the area over 20 years ago (between 1975 and 1992). The remaining 25 percent are more recent migrants who settled in the Afungi Project Site and Surrounds after the Peace Agreement in 1992.

The Household Survey revealed that there are some differences within the areas surveyed. The higher proportion of households that are native and long-term migrants to the area reside mainly in the villages of Quitupo and Maganja (82.7 and 90 percent respectively). The higher proportion of more recent migrants was observed in areas around Quitupo Village and in the Coastal Zone (41 percent and 50 percent respectively), identifying that these people moved into the specific area after the 1992 Peace Agreement. In Senga Village, 60 percent of the residents have lived in the area for more than 20 years, while the remaining 40 percent settled in the village after the 1992 Peace Agreement.

Of those who migrated to the area, nearly 53 percent of households originated from other areas of Palma District (2), while 15 percent came from other districts within the province. The proportion of surveyed households that are seasonal migrants was relatively small at 4.3 percent, most of whom came from Palma town.

(1) The Mozambican National Institute for the Support of Refugees (INAR), under the supervision of the Mozambican Ministry of Foreign Affairs.
(2) Of this 53 percent, approximately 28 percent came from Palma, 18 percent from other zones/villages of the Palma Administrative Post, and 7 percent from another Administrative Post in the Palma District.

Table 9.22 Duration Surveyed Households have Lived in the Afungi Project Site and Surrounds

	Quitupo (%)	Quitupo Settlements (Production Zones) (%)	Coastal Zone (%)	Senga (%)	Maganja (%)	Total (%)
Always lived there	71.2	37.5	40.9	50.0	73.3	60.0
From independence to the war (1975–1980)	9.6	12.5	-	10.0	10.0	8.6
During the war (1980–1992)	1.9	-	9.1	10.0	6.7	5.0
After the Peace Agreement (1992–2011)	17.3	50.0	40.9	30.0	10.0	25.0
Unknown	-	-	9.1	-	-	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Impacto, 2012.

9.10 PALMA DISTRICT AND AFUNGI PROJECT SITE AND SURROUNDS: USE OF NATURAL RESOURCES

9.10.1 Use of Natural Resources in the Afungi Project Site and Surrounds (Including Senga and Maganja)

Forest Resources

The villagers communally use forested areas, and *Table 9.23* shows the type of timber and non-timber forest products collected including firewood, wild fruits and medicinal plants. Hunting is also widely practised by the communities in these areas (97.9 percent) (1). The main forest resources supporting communities and their livelihoods are further discussed below.

Table 9.23 Availability and Use of Natural Resources by the Surveyed Households

	Availability (%)	% who collect	% who consume	% who sell
Grass for roofing	99.3	25.9	78.6	2.4
Coconut or palm tree leaves for the construction of houses	100	96.4	87.6	20.9
Grass/reeds to produce mats, baskets (crafts)	96.7	59.6	77.4	26.2
Coconut or palm tree leaves to produce mats, baskets (crafts)	99.3	87.1	84.7	26.6
Poles for the construction of houses	98.6	97.8	89.6	12.7
Tree trunks (kiaat tree, panga-panga)	59.3	6.0	50	-
Trees to produce charcoal	97.1	7.4	64.3	28.6

(1) These questions were constructed to understand if the resource is available and if the household collects or uses this same resource. Those who consume and/or sell are subgroups of those responding 'yes' to collection or use of the resource.

	Availability (%)	% who collect	% who consume	% who sell
Trees to produce firewood	98.6	94.9	87.8	13.1
Medicinal plants	97.9	73.0	89.3	13.7
Trees to host bees	82.1	30.4	89.7	15.4
Hunting animals	97.9	35.0	90.6	34.6
Fish	99.3	93,5	92,2	59,7

Source: Impacto, 2012.

Coconut, palm tree leaves and grasses are used for the construction of housing structures and for making mats and baskets. Coconut, palm tree leaves and grasses are collected by 96.4 percent of the surveyed households for use in housing construction and, to a lesser extent, for crafts. Although widely available, grasses for thatching are used for roofing by only 25.9 percent of the surveyed households, and by 59.6 percent of the households for crafts. Most households prefer to use palm/coconut leaves for roofing material, as it is more traditional.

Forest wood is used by approximately 94.9 percent of the households for firewood and by 97.8 percent of households for housing construction/framing. The majority of households use firewood for fuel as their main source of energy, specifically for cooking purposes. The majority of the wood collected is used by the collectors themselves, while 13.1 percent surveyed sell firewood for income.

Of the wood collected for construction, 89.6 percent is used by the collectors themselves and 10.4 percent sold. Firewood and timber for construction are generally sold in the fishing centres to migrant fishermen or fish traders, who are dedicated full time to their fishing activities and unable to gather the resources themselves, sold to wood traders, or transported by sea or foot to sell in marketplaces such as Palma town, where there is demand.

Medicinal plants are collected by approximately 73 percent of the surveyed households. Of this group, 89.3 percent collect these plants for their own use and 13.7 percent sell the plants to others.

The **production of charcoal** is not commonly practised in the area, and only 7.4 percent of the surveyed households reported that they use forest wood for the production of charcoal.

Hunting is undertaken, mainly for subsistence purposes, by 90 percent of the surveyed households, of which 34.6 percent reportedly sell the meat. Hunting is undertaken using traditional traps, and the most commonly hunted animals in the forest areas are gazelle and the helmeted guinea fowl.

Water

Households use surface water and groundwater for drinking and other domestic uses (this will be further addressed in *Section 9.13.3*). There is no known collection of rainwater for drinking, using systems such as cisterns. Use of surface water to irrigate farming plots is limited to some cases of manual watering by households growing vegetables in lowland areas.

Other Areas of Collective Use

Grazing fields, lakes, rivers and lagoons are communally shared resources. Livestock keeping is uncommon in the area; keeping cattle is rare due to the high incidence of tsetse fly. As such, grazing areas are hardly used, even though they are available. Many households will, however, keep chickens and goats.

Fisheries

Fish was also reported by 99.3 percent of households as a natural resource that was widely available. Of those who use fish, 92.2 percent do so for household consumption and 59.7 percent sell fish (small-scale fisheries in Palma District and Afungi Project Site and Surrounds will be addressed in *Section 9.14.3*).

9.11 PALMA DISTRICT AND AFUNGI PROJECT SITE AND SURROUNDS: LAND USE AND OCCUPATION PATTERNS

9.11.1 Existing and Applications for DUATs in Palma District

Land permits issued (or with applications pending) in the Palma District include land use activities such as game farms, forest concessions, agricultural land, campsites, residential and tourism areas. *Table 9.24* and *Figure 9.18* provide a summary of the status of current and pending DUATs in Palma District (Provincial Services of Geography and Land Registry (1), 2011) (2). Game farms and reserves, as well as forest concessions, represent the majority of the areas already with a DUAT or in the process of obtaining a permit.

Table 9.24 DUAT Applications and Permits by Activity, 2011

DUATs in 2011	DUAT Area (ha)	No.
Forestry Concessions	**35,799**	**1**
DUATs Issued	**57,301**	**17**
Tourism (different classes)	7	
Agriculture	1	
Game farms	3	
Residential/other purposes	2	
Construction contractors' campsites	4	

(1) Serviços Provinciais de Geografia e Cadastro.

(2) In Palma District, land use assessment resumed to the occupation of land through DUATs already issued or required to the relevant authorities (provincial or central, according to the area required, to have an understanding of the other major development in initiatives using large areas in the district.

DUATs in 2011	DUAT Area (ha)	No.
DUATs Applied for /Planned Areas	**83,426**	**9**
Game farms	8	
Industry (LNG Project)	1	

Source: Provincial Services of Geography and Land Registry, 2011.

9.11.2 Afungi Project Site (1)

The areas closely related to land use and occupation patterns in the area are based on settlements and livelihood activities, and include settlement areas (2 percent), highland agriculture areas (7 percent) and coconut plantations (2 percent).

The land use and occupation in the Afungi Project Site by its inhabitants is briefly described below, and illustrated in *Figure 9.19*. Most inhabitants of the Afungi Project Site are permanent residents, but there are also cases of seasonal residents coming from Palma town and neighbouring villages (see *Section 9.9.4* and *Table 9.22*).

Settlement Areas

Settlement areas occupy only 2 percent of land in the Afungi Project Site (137ha) and correspond to areas occupied by the concentrated settlements of Quitupo Village, Milamba 2 and N´semo, as well as scattered and low-populated settlements such as the production zones and fishing centre of Ngodje.

Highland Agricultural Areas

Highland agricultural areas account for 7 percent of the Afungi Project Site (478ha). These areas are located in the grassland zones, usually adjacent to riverbanks in the high/plateau areas, where sandy soils are dominant. These areas are usually used for crop farming (cassava, sorghum, maize, beans and peanuts, as well as cashew trees, mango trees and coconut trees), as shown in *Figure 9.16*. Quitupo Village and the scattered settlements surrounding Quitupo (production zones) are located in these highland areas. These farming areas are critical for the villagers' livelihoods of subsistence-based agriculture and income generation, when surplus can be traded.

Lowland Farming Areas

Lowland farming areas are located in the floodplain areas – mosaics that occupy approximately 15 percent of the Afungi Project Site. These areas have the most productive soils and are mainly used to grow food crops such as rice, sweet potatoes, bananas and sugar cane (*Figure 9.17*). Rice is an important food crop for the local population, and income when surplus is sold.

(1) In this particular case of assessing the land use, only the Afungi Project Site was considered.

Households generally settle in the highland areas located close to the floodplains, so as to have easy access to the rich agricultural lowland areas.

Figure 9.16 Huts and Crops in the Highlands within the Afungi Project Site

Cassava field with mango trees

Cassava field with farm huts

Permanent residence in the area near Quitupo with coconut, cashew and mango trees

Field near Quitupo with coconut and cashew trees (some recently planted)

Source: Impacto, 2012.

Figure 9.17 Cultivated Land in the Lowlands, Ntaunadge Production Zone

Lowlands with rice, banana and sugar cane crops

Rice field in the lowlands

Source: Impacto, 2012.

Coconut Plantations

Coconut plantations occupy 2 percent of the Afungi Project Site, and include coconut plantation areas and settled coconut plantation areas, each occupying 1 percent of the Site as described below.

- The **coconut plantation areas** are sparsely or not populated, and mostly located along the coast of Ngodje. They consist of deteriorated or semi-abandoned coconut trees owned by the State (1) and other small landowners. There are also coconut plantations located in small patches near residential areas such as the Quitupo and Quitupo Settlements (production zones).

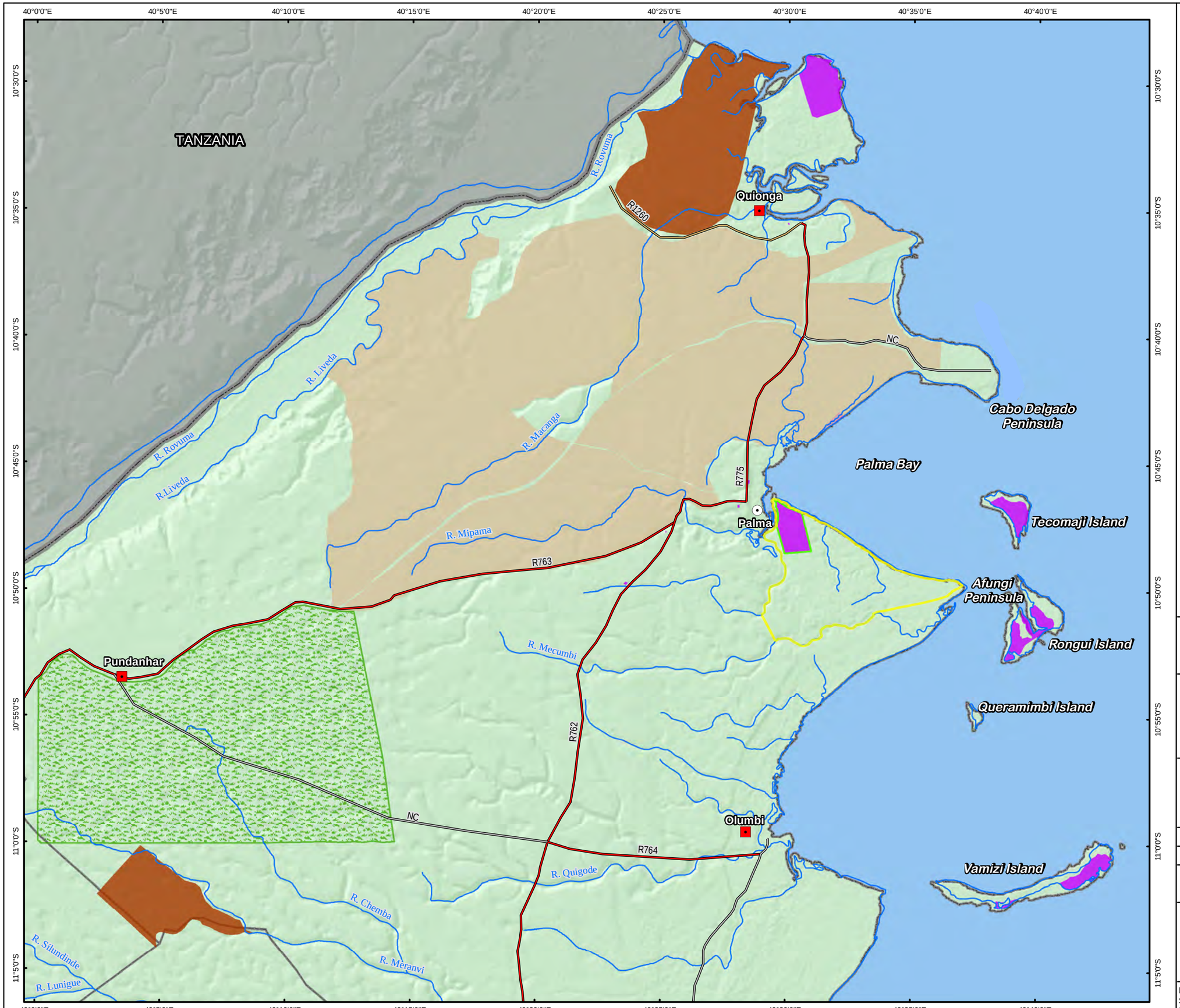
- **Settled coconut plantation areas** consist of coconut plantations also located along the coast. In the north-west part of Ngodje Zone, the coconut plantations belong to a private operator under a DUAT. While in the Milamba (1 and 2) and N´semo Zones, the coconut plantations belong to local residents. Other coconut plantation areas are located in small patches dispersed within the territory of the Afungi Project Site, generally near residential areas.

DUAT Area Assigned to a Private Operator

In the north-west of the Afungi Project Site, there is an area of approximately 667ha that belongs to a company called Kilaguni Lda, which was bought for tourism development (see *Figure 9.18*). The area is not developed and has a small number of huts on the coast that were intended for tourism occupation, a conventional house on the sea shore near Ngodje, and a plantation of deteriorated and semi-abandoned coconut trees with some settlements, also along the coast of Ngodje (2).

(1) According to information collected from the District Administration and during the Social Assessment, the Ngodje palm plantations originated from palm trees planted during colonial times, were abandoned after Mozambique became independent, and have since become the property of the State. Parts of these palm plantations were ceded to private operators.

(2) The consultant was informed that this private operator has some guards residing along the coast to control the coconut tree plantations.



Legend

- District Centre
- Administrative Post Centre
- Rivers

Roads

- Tertiary
- Local
- Non Classified

- Afungi Project Site
- Existing DUAT Area, not held by AMA1

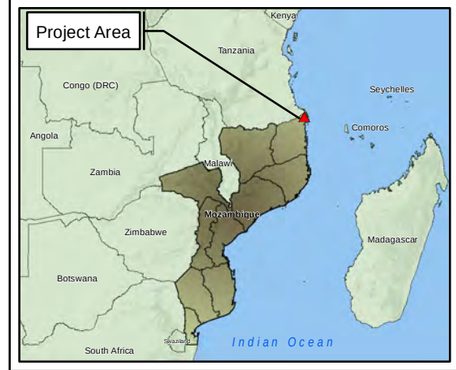
- District Boundary

Area with DUATs

- Tourism
- Game Reserve

Requested Areas

- Game Farm
- Forest Concessions



MAIN MAP SCALE:

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Kilometers

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TITLE:

Figure 9.18: Existing and Requested DUATs (2011)

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
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DRAWING: Existing and Requested DUATs (2011).mxd

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Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

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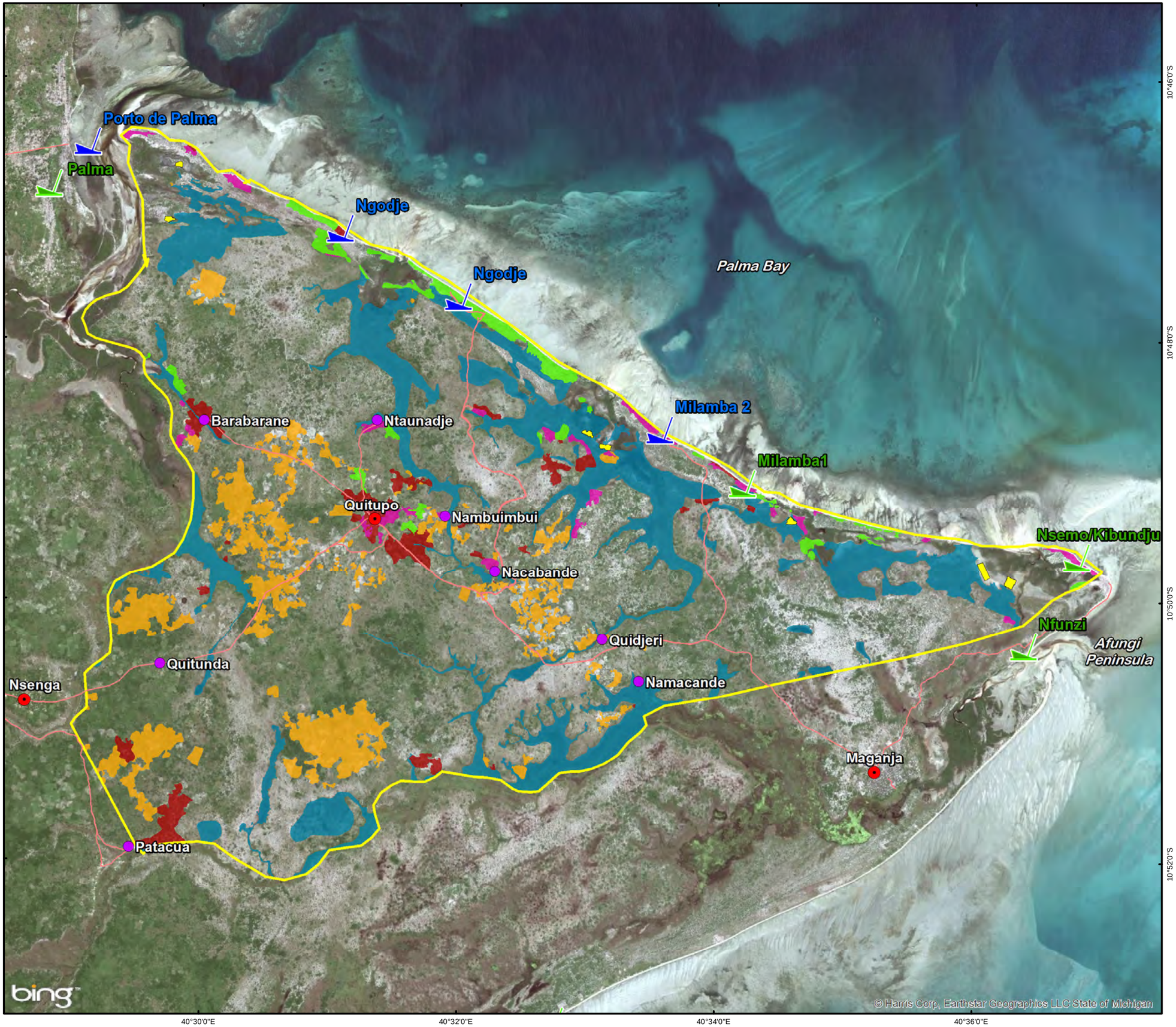

Legend

- Administrative Post Centre
- Villages
- Settlement (production zone)
- Settlement with Fishing Centre
- Fishing Centre
- Local Roads
- Afungi Project Site

Land Cover and Land Use

- Farming Areas
- Coconut Plantation
- Coconut Plantation with Human Occupation
- Human Occupation
- Mosaic of Floodplain and Farming Areas
- Salt Pans

MAIN MAP SCALE:

0 1 2 3 Kilometers

N

TITLE:

Figure 9.19:
Land use in Afungi Project Site

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
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DRAWING: Land use in the DUAT Area.mxd

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Impacto Projectos e Estudos Ambientais

ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: Bing Maps ©2010 Microsoft Corporation.
Impacto, 2012. Inset Map: Esri Data & Maps

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9.11.3 Land Tenure

Based on the 2011 Household Survey done as part of the Social Assessment (140 households surveyed in November 2011), the majority of land occupied by households in the Afungi Project Site and Surrounds (including Senga and Maganja) was acquired through occupation (about 42 percent) or inheritance (about 31 percent) [(1)](*Table 9.25*). Only 1.4 percent mentioned that the land was assigned to them by the Government, and 12 percent reportedly acquired the land through the community authority [(2)]. The latter probably corresponds to households that have come from other areas of the District, or from outside the District.

Table 9.25 Access to Agricultural Land by Surveyed Households

	Plot 1 (%)	**Plot 2 (%)**	**Plot 3 (%)**
Assigned by the community authority	12.1	1.4	0.7
Assigned by the Government	1.4	0.7	-
Rented/borrowed	4.3	2.9	1.4
Occupation	42.1	23.6	7.1
Inheritance	30.7	20.7	2.6
Purchase/other type of acquisition	7.8	5.7	2.1

Source: Impacto, 2012.

In FGDs, villagers reported that in-migrants usually acquired land in the area through community channels. A new person to the area will request land from the Community Leader who, in turn, identifies available/unoccupied land. Before land is assigned, the Leader calls a meeting with all the residents of the village to present the person to the community. The individual has to produce documents regarding his origin (a letter from the local state or community authority from where he/she comes is generally well accepted). If the majority of the residents approve the person, the leader will then make land available to that person. Local Leaders suggest that this process eliminates conflict related to land, as all residents are made aware of the new person moving into the area and the land that the person is to be allocated. All residents (new and old) enjoy the same rights to village land.

According to the Household Survey, people are allowed to lease land to others, and at least 4.3 percent of the households interviewed reported that they were using leased/borrowed land. This is, however, a new trend, and it is believed that it is not controlled by the authorities or local Leaders.

(1) According to Land Law No. 19/97, local community members hold right s over land based in customary norms and practices, or through good faith occupation for more than 10 years. This right does not need to be documented through a land title. Inheritance and occupation of land result in land rights not needing permits or assignments by authorities.
(2) The Social Assessment identified the Village Leader, the Village Leaders Assistant and Chiefs of Zones as the relevant community authorities. However, community organisation has to be deeper assessed.

The main donors involved in funding activities in Palma District are the United States Agency for International Development (USAID), the Centre for Disease Control and Prevention (US Government), the Millennium Challenge Account (MCA) (1) and the Spanish Cooperation. The activities are implemented directly by the Government, non-governmental organisations (NGOs) or private companies involved in development.

At the time of this assessment, four implementing agencies were identified as relevant and active organisations operating in Palma District, and are described below (*Table 1.5* in *Annex G* provides more information about these organisations).

The Elizabeth Glaser Paediatric AIDS Foundation (EGPAF) is an NGO dedicated to preventing paediatric HIV infection and eliminating paediatric AIDS through research, advocacy and prevention, care and treatment programmes. In 2004, the EGPAF initiated activities in Mozambique with a prevention of mother-to-child transmission (PMTCT) programme in Nampula and Gaza provinces. EGPAF now works in four provinces, supporting the Ministry of Health to strengthen the implementation of PMTCT services at 254 sites across the country, as well as HIV care and treatment services at 67 sites. The EGPAF's work includes:

- increasing and expanding access to HIV-related services;
- strengthening existing PMTCT and HIV care and treatment services;
- improving the capacity of governmental departments;
- increasing the capacity of health facilities and communities to respond to the needs of people living with HIV;
- contributing to the development and implementation of national policies and guidelines; and
- improving monitoring and evaluation systems.

The Provincial Directorate of Health and the District Service for Health, Women and Social Affairs are the EGPAF's partners at provincial and district level respectively. The main assistance provided to Palma District is technical assistance, the training of District personnel and health professionals and the funding of related activities.

Food for the Hungry (FH) is an international humanitarian organisation with a focus on ending world hunger. Its Multi Year Assistance Program is funded by USAID and operates in Sofala and Cabo Delgado provinces, in areas of

(1) The MCA is an entity with the Millenium Challenge Corporation that is legally registered to operate in Mozambique.

intervention that include nutrition and health, water and sanitation, and food security. FH has a head office in Pemba and a District office in Palma. Its activities in Palma District are focused on three main lines of action:

- capacity building in the community through working with community leaders;

- agriculture, with the goals of guaranteeing food security and promoting cash crops, connecting farmers with the market. FH also promotes the creation of savings groups comprising 15 to 20 persons, and provides technical assistance to these groups with a view to their consolidation; and

- health and nutrition, with the main target group being pregnant women and children less than five years of age. In this line of work, the organisation also promotes access to drinking water and basic sanitation in the communities where it operates, assisting the communities to improve their access to safe water through the construction and management of new water sources.

Joint Aid Management (JAM) performs relief and sustainable development work throughout Africa. Its programmes, which are based on a Complete Community Development Approach (CCDA), include nutritional school feeding and interventions; orphan and vulnerable child care; water and sanitation; and food development, which includes agricultural development and the production of food.

Cowater International is a Canadian international consulting company working in Mozambique in development activities, mostly in the northern provinces of Nampula, Cabo Delgado and Niassa, and in the water sector.

In Palma District, JAM and Cowater operate in communities, contracted by FH and MCA as implementing consultants organising communities for the receipt and management of water sources, within the scope of the implementation of the Política Nacional de Águas (Mozambican National Water Policy) (1). Their work includes the preparation of communities for the opening of water boreholes and the installation of manual pumps. FH and MCA provide a substantial part of the funds for purchasing equipment, hiring the contractor and consultant support (JAM and Cowater). As beneficiaries, the communities themselves also contribute funding and their time to support these initiatives. Cowater and JAM facilitate all community organisation work, train the Water Committee (comprising 12 community members), and create conditions for the contractor to train the maintenance and repair group.

(1) Generally, the intervention of donors in the water sector is providing funds for communities that don't have access to safe water and are willing to organise themselves and contribute to have a water source. The repair of broken pumps is generally the responsibility of the community and of the local government, using funds raised by the community and Government budget.

9.13 PALMA DISTRICT AND AFUNGI PROJECT SITE SOCIAL SERVICES

9.13.1 Education Profile and Network

Palma District

In 2007, the level of educational attainment was quite low amongst the population of Palma District, with 88 percent of the population not completing any level of education. This is 7 percent higher than that of Cabo Delgado Province (at 81 percent) as a whole (see *Table 1.6* in *Annex G*). The percentage of those who complete EP2, ESG1 and Basic Technical Education (BTE) is also very low in the District (2.4 percent, 1.2 percent and 0.04 percent respectively). This is attributed to a lack of available schools teaching these levels and a limited numbers of teachers (INE, 1997d).

Table 9.26 shows that, in 2012, there were a high number of students attending EP1 (90 percent), compared with EP2 (6 percent) and ESG (4 percent) schooling levels, showing a large discrepancy between the two levels and that a large number students do not enter the second degree of primary education and therefore do not finish the Primary Education Level (EP1 + EP2) (1).

In Palma town, the First Cycle ESG School doesn't have proper facilities and is working inside the EP2 facilities. There are more males than females enrolled in all schooling levels, as well as a high number of male teachers compared to female teachers. In addition, there is a high attrition in female attendance between EP1 and EP2 (from 43 to 31 percent), which is attributed to early marriages (2) (a local custom that is deeply rooted among the residents of the District and in the Afungi Project Site and Surrounds, in particular). The education curriculum in schools is delivered in Portuguese (3).

Table 9.26 Schools in Palma District (2012)

Location	No. of Schools	No. of Students			No. of Teachers			
	Traditional Construction	Conventional Construction	Male	Female	Total	Male	Female	Total
EPI PRIMARY EDUCATION FIRST DEGREE								
Locality Palma Capital	7	4	2.289	1.770	4.061	41	30	71
Mute Locality	7	2	1.510	1.113	2.623	32	9	41
Olumbe AP	7	2	1.697	1.343	3.040	28	6	34
Pundanhar AP	3	1	498	409	907	13	1	14
Quionga AP	4	2	995	666	1.661	18	2	20
Total EP1	28	11	6.989	5.303	12.292	132	48	180
EP2 PRIMARY SECOND DEGREE								
Locality Palma Capital	0	2	315	162	477	15	3	18
Mute Locality	0	2	59	22	81	7	0	7
Olumbe AP	2	1	144	41	185	8	0	8

(1) The reasons for this discrepancy are complex and inter-related. Any intervention to develop education in the District needs to understand these factors in order to design a systemic approach and a consistent and long-term action plan.
(2) Young girls are expected to get married immediately after reaching puberty.
(3) According to the District education authorities, there is no bilingual education in primary schools in the Palma District.

Location	No. of Schools	No. of Students			No. of Teachers			
	Traditional Construction	Conventional Construction	Male	Female	Total	Male	Female	Total
Pundanhar AP	1	1	61	38	99	7	0	7
Quionga AP		1	30	12	42	4	0	4
Total EP2	3	7	609	275	884	41	3	44
GENERAL SECONDARY EDUCATION FIRST CYCLE								
Locality Palma Capital			400	180	580	18	1	19
Total ESG1			400	180	580	18	1	19
Total of District	**31**	**18**	**7.998**	**5.758**	**13.756**	**191**	**52**	**243**

Key:
A.P. = Administrative Post.

Source: Palma District Services of Education, Youth and Technology, 2012.

Afungi Project Site and Surrounds (Including Senga and Maganja)

Literacy levels in the Afungi Project Site and Surrounds are generally very low (see *Table 9.27*). Women, in particular, have very low levels of education, and 92 percent are illiterate. Adult Literacy and Education (ALE) programmes are aimed at people who are not of school age, and these are available throughout the country. In the Afungi Project Site and Surrounds, however, only one village (Senga) still has an ALE programme. In Quitupo and Maganja villages, the programmes have been discontinued due to a lack of available teachers. Some of those who attended the ALE classes have dropped out, due to subsistence activities such as farming that seasonally takes priority during the preparation of land or harvesting.

Table 9.27 Education Level of the Head of the Surveyed Household and Spouse

Education Level	Head of Household (1) (%)	Spouse or Wife of Head of Household (2) (%)
Illiterate	58.6	92.1
Basic level reading and/or writing	30.7	4.7
Primary school level 1	7.1	0.8
Primary school level 2	2.2	-
Middle school	0.7	-
Does not know/did not respond	0.7	2.4
Total	100.0	100.0

Note:
(1) 140 heads of households were surveyed.
(2) 127 wives of heads of households were surveyed.

Source: Impacto, 2012.

School Network and Access

There are three schools in the Afungi Project Area and Surrounds, two of which are EP1 level facilities (Senga and Quitupo) and one is an EP2 level facility (Maganja), as shown in *Table 9.28*. Since Maganja Village and Palma

town are relatively far from the villages of Quitupo and Senga and other settlements in the Afungi Project Site and Surrounds, many children who reside in these areas only complete EP1 level education and do not continue on to EP2, to complete a full primary school education.

The schools in the area are usually constructed from locally sourced materials such as mud bricks, poles and fronds, with the exception of Maganja School, which was built of modern materials (blocks, corrugated iron, etc). Schools are often built and maintained by the communities (see *Figure 9.20*). In some communities, there are no classrooms, and learning occurs outdoors under trees (such as the case in N´semo, a settlement with fishing centre that is part of Maganja Village) and Quitupo.

Table 9.28 School Facilities in the Afungi Project Site and Surrounds

Village	Type		No. of Students		No. of Teachers	
	EP1	EP2	Men	Women	Men	Women
Quitupo	1	-	205	123	3	1
Senga	1	-	110	94	3	1
Maganja	-	1	291	218	6	1
Total	2	1	606	435	12	3

Source: Palma District Services of Education, Youth and Technology, 2012.

Figure 9.20 Schools in the Afungi Project Site and Surrounds

EP1 in Senga

EP1 in Quitupo

First classroom, N´semo

Second classroom, N´semo

EP1 room in Senga

Source: Impacto, 2012.

Challenges facing the education system in the Afungi Project Site and Surrounds include:

- a lack of teachers;
- a lack of materials as well as desks, books, classrooms and school uniforms;
- a lack of EP2 level schools;
- the long travel distances to the nearest school (*Table 9.29*);
- high dropout rates due to food security issues (children are expected to assist with the harvest); and
- high dropout rates among young girls, due to early marriage and teenage pregnancy.

Table 9.29 Average Travel Time to Schools by Surveyed Household Members

	Average Travel Time Required (Minutes/One Way)		
	EP1	**EPC**	**ESG**
Quitupo	6	87	87
Quitupo Settlements (production zones)	27	40	40
Coastal Zone	81	141	151
Senga	8	82	82
Maganja	24	21	187

Source: Impacto: 2012

9.13.2 Health Profile and Network

Palma District

The provincial health data for Cabo Delgado Province generally reports indicators that are well below the national averages. The provincial morbidity and mortality rates are higher than national rates, with the last reported provincial under-five mortality rate and infant mortality rates reported in 2003, at 241 and 178 per 1,000 live births respectively (World Bank, 2003).

The main notified diseases and the trend between 2010 and 2011 with the morbidity profile, number of deaths, incidence rate and mortality rate is summarised in *Table 9.30*. This highlights the burden of disease from malaria, and also notes that this has fallen by nearly 21 percent from the 2010 figures. It is noted that the health baseline presented in this chapter has limitations, due to the nature of data management and the health-seeking behaviours of the community.

Table 9.30 Main Illnesses Reported in Palma District, 2008–2011

Diseases	Notified Cases			Notified Deaths			Incidence Rate (%)		Mortality Rate (%)	
	2011	2010	Change (%)	2011	2010	Change (%)	2011	2010	2011	2010
Measles	4	3	33.3	0	0	0	0.01	0.01	0	0
Neonatal tetanus	0	0	0.0	0	0	0	0.00	0.00	0	0
Pertussis	0	0	0.0	0	0	0	0.00	0.00	0	0
Malaria	10,622	13,418	-20.8	18	18	0	20.15	26.03	0.2	0.1
Acute flaccid paralysis	3	1	200	0	0	0	0.01	0.00	0	0
Animal bite	1	0	0.0	0	0	0	0.00	0.00	0	0
Diarrhoea	1,214	1,509	-19.5	1	3	-66.7	2.30	2.93	0.1	0.2
Dysentery	406	444	-8.6	0	0	0	0.77	0.86	0	0
Cholera	0	0	0.0	0	0	0	0.00	0.00	0	0
Plague	0	0	0.0	0	0	0	0.00	0.00	0	0
Meningitis	0	0	0.0	0	0	0	0.00	0.00	0	0

Source: Austral COWI, 2012.

This remainder of this section provides the health baseline for the Project Area (1). To align with the IFC performance standards, the methodology outlined in the Good Practice Notes for Health Impact Assessment (HIA) from the IFC was followed. The IFC methodology uses 13 environmental health areas (EHAs) to support the systematic analysis of health considerations. The set of EHAs provides a linkage between Project-related activities and potential positive or negative community-level impacts.

Stakeholders Opinions and Comments

Various stakeholders (ranging from national, provincial and district representatives of MISAU to members of the Afungi communities) were consulted during the completion of the health baseline. Stakeholder opinion and comments related to any development are vitally important, as people who have experience/insight in the area often understand the context and particular health challenges better. They will understand vulnerabilities of the communities and the ability of the communities and authorities to deal with any changes in the area, as well as the ability to cope with potential health impacts.

The comments and concerns of key stakeholders who were consulted as part of the health data collection exercise are summarised in *Table 9.35*.

(1) The health baseline study forms part of a Rapid Health Impact Assessment (RHIA) undertaken for the EIA Report. The baseline is required as part of the RHIA to identify and estimate the lasting or significant changes of different actions on the health status of a defined population, thereby assisting the Project in understanding the existing health needs of the community and considering the future consequences of different Project options on human health.

Environmental Health Areas

The baseline health description will be further summarised based on an EHA framework. This EHA framework covers a broad view of environmental health and encompasses a wide spectrum of health determinants, including social and institutional issues. The 13 EHAs and their specific area of focus are detailed in *Table 9.31* below. These baseline health descriptions are discussed for each relevant EHA, and include a summary description of the prevailing health conditions in the Study Area and the institutional capacity of the local authorities and the communities to manage or adjust to any potential health impacts or changes in the area that may affect health.

Table 9.31 Environmental Health Areas (EHAs)

	EHAs
1	Communicable diseases linked to overcrowding and poor environmental/socio-economic conditions
2	Vector-related diseases
3	Soil, water, hygiene and waste-related diseases
4	HIV/AIDS and sexually transmitted infections (STIs)
5	Food and nutrition-related issues
6	Non-communicable diseases
7	Accidents and injuries
8	Veterinary medicine and zoonotic diseases
9	Environmental health determinants/exposure to hazardous materials
10	Social determinants of health
11	Cultural health practices
12	Healthcare services and infrastructure
13	Health programmes and systems

EHA #1: Communicable Diseases Linked to Overcrowding and Poor Environmental/Socio-economic Conditions

Housing is rudimentary in the Study Area, with natural materials used for construction. Overcrowding did not appear to occur. Cooking was mainly performed in separate structures outdoors, but as biomass fuels were generally used, there is the possibility of exposure to poor air quality that can increase the risk of respiratory disease. Electricity is not available.

Community Health Needs/Vulnerabilities

- Tuberculosis (TB) is one of the leading causes of morbidity and mortality in Mozambique. This burden is increasing as a result of the co-morbid link with HIV/AIDS.

- At the local level, TB case detection was limited due to poor health-seeking behaviour and limited access to health services. Awareness and knowledge related to TB was also limited.

- Acute respiratory diseases are ranked as the third leading health challenge in the province, and the high rates of morbidity are compounded by co-

morbid factors such as anaemia, diarrhoea, malaria and chronic malnutrition.

- As the rural communities are relatively isolated, they can be considered vulnerable to influenza outbreaks.

Institutional Capacity

There is no data on standard TB indicators and, with the poor access to healthcare and limited health-seeking behaviour, it is challenging to understand what the burden of disease related to TB actually is.

- Treatment success rates are likely to be good, as there is a functional Directly Observed Treatment Short Course (DOTS) programme. However, access may limit follow-up, and the community health agents (CHA) programmes are not strong.

- With regards to ARI, the diagnostic capabilities in Palma District are limited with no radiological service, limited laboratory services and no nucleic acid amplification.

- There is a functional Routine Health Information Management System (RHMIS) in the District, but this is limited by the lack of diagnostics and skilled staff. Monitoring of specific health indicators is thus limited.

- There is minimal institutional capacity to manage any large-scale influx into the area.

EHA #2: Vector-related Diseases

Community Health Needs/Vulnerabilities

- There is no verifiable data on the burden of disease from malaria in the Project area but, due to recent interventions, there is an indication that malaria transmission is reducing. The lack of reliable diagnostics means that malaria is often overdiagnosed (Palma District Health Profile, 2011).

- Studies at the national level have estimated an annual incidence of malaria at 50 to 100 cases/1,000 population. In the 2007 MIS study, 71 percent of children aged six to 59 months tested positive on malaria rapid diagnostic tests (RDT) and 36.5 percent on slides (National Malaria Control Programme, 2007).

- Diagnosis is made by RDT and microscopy in Palma, but there is a reliance on RDT in the rural health centres. Stockouts of both RDTs and medication were reported to occur commonly in the rural areas.

- Knowledge related to malaria and prevention activities was limited, with a national study highlighting that only 28 percent of respondents reporting that mosquito nets offer some protection against malaria. This was

supported in the FGDs conducted in the Study Area. Control measures are limited in the Study Area. Insecticide-treated nets (ITN) have been distributed through the District, but utilisation is reported to be poor, which is related to the poor knowledge in the communities. In the FGDs, most households admitted to owning ITNs and children generally slept under them.

- There is a risk that dengue fever and chikungunya fever may occur along the coastal areas, especially where there are ports served by ships from regional and especially international destinations. The environment is suitable for the transmission of arboviral infections, and the vector is likely to be widely distributed.

- Lymphatic filariasis (LF) is an important local vector-borne disease that is subject to an eradication campaign. Human African trypanosomiasis (HAT) has not been reported locally, despite the reported presence in the disease vector (tsetse fly).

Institutional Capacity

- There is a functional National Malaria Control Programme (NMCP), but there is limited capacity to extend all elements of the programme to the rural areas in the far north of the country.

- There is also limited ability to understand malaria's true burden of disease due to the erratic supply chain, inability to report cases accurately, poor access to health services and the communities health-seeking behaviour. The same applies to arboviral diseases, LF and HAT.

- The ability to monitor changes effectively in malaria transmission and prevalence at the local level is also limited, due to inadequate surveillance mechanisms.

- The existing environmental health challenges may worsen if there are large-scale developments with resultant unplanned developments, resulting in an increased risk of transmission of malaria.

EHA #3: Soil, Water, Hygiene and Waste-related Diseases

Community Health Needs/Vulnerabilities

- Access to improved water sources is a major national challenge. Only 36 percent of the population of Cabo Delgado Province have access to these improved sources (UNICEF, 2010).

- Access to water was a major issue in the Study Area. In general, the community makes use of unprotected wells and streams as the required payment for water from protected standpipes prohibits their use. The 2007 Census reported that the majority of the households in the District

are supplied by unimproved water sources (68.8 percent), while the socio-economic baseline reported that 58 percent of the communities sampled obtained their water from protected sources (Impacto, 2012). Sanitation services were practically non-existent, with most communities practising open defecation in the sea or bush. There was a challenge to constrict latrines, due to the sandy soil and high water table. Latrines were generally only used for urination.

- Diarrhoeal diseases are the second-most common cause of morbidity in Palma District. The District had cholera outbreaks in 2009 and 2010.

- Skin (jiggers or tungiasis and fungal infections) and eye infections (conjunctivitis) related to poor hygiene are reported to be common.

- Soil-transmitted helminths (STHs) are common and, while there are quarterly school-based programmes to reduce the burden of disease, it was reported that roundworm and hookworm were especially common. Based on models, it is anticipated that the prevalence of STHs is over 50 percent in the District (Augusto et al., 2009).

- Symptoms suggestive of urogenital schistosomiasis were reported to be common, from men interviewed in the Study Area. The health authorities reported that they have no accurate data, but that they are more common around Pundahar and localised wetlands. Based on models, it is anticipated that the prevalence of urogenital schistosomiasis was between 50 and 100 percent in the District (Augusto et al., 2009).

- There is limited local knowledge regarding basic sanitation and hygiene practices.

Institutional Capacity

- There is minimal institutional capacity to provide basic services. The local District authorities may find it difficult to plan or support any increased demand on the required infrastructure or services.

- Outbreak response would require external support as diagnostics, human resources and logistical capacity are limited. The health services in the District have limited capacity to support information, education and communication (IEC) programmes that promote water use, hygiene and sanitation programmes.

EHA #4: HIV/AIDS and Sexually Transmitted Infections

Community Health Needs/Vulnerabilities

- In 2009, the estimated national prevalence of HIV/ AIDS and sexually transmitted infections in women and men was 13.1 percent and 9.2 percent respectively. The prevalence in Cabo Delgado was 9.5 percent and 9.2

percent in women and men respectively (INE, Ministério da Saúde and MEASURE DHS+/ORC Macro, 2009). The highest prevalence was in the age group from 20 to 24 years of age, with a significant gender difference that ranges from 1.2 to 4.2 percent in males and 5.9 to 11.1 percent in females (USAID, 2010; UNAIDS and WHO, 2008).

- The prevalence of HIV in Palma District is not known but, using statistics from the health centres, this was estimated at 3 percent based on provider initiated counselling and testing (PICT) in 2011. It is, however, likely to be closer to 9 percent, based on provincial statistics. As part of the fight against HIV/AIDS, the Government and NGOs have increased their awareness-raising campaigns, HIV testing and distribution of condoms.

- The uptake of HIV testing in antenatal care (ANC) is very good, as it is more or less mandatory. While the prevalence in this group was not known, it can potentially be used as a very good indicator for the current HIV prevalence. However, the uptake is limited by stockouts of HIV RDT and limited access to health services, limiting attendance of ANC.

- STIs are reported to be common and increasing in the Study Area.

- Polygamy and infidelity is common, and complex sexual networks occur in the area. It is not uncommon for a man to have four wives.

- It was reported that the general community has poor knowledge on HIV/STI transmission and prevention practices, and thus behaviours are poor. This was confirmed in the FGDs. This is related to limited access to information on health-related topics, and poor education.

- Teenage pregnancy is a significant social and health issue, with a reported increasing trend. There is an associated increase in STIs/HIV in this young age group, with alcohol abuse being a major cause of high-risk sexual activity.

- Condom usage is reported to be low, despite general availability. This has a cultural/ religious basis and relates back to limited consistent knowledge.

- Commercial sex workers (CSW) were reported to occue in the area according to both the FGDs, Key informant interviews (KIIs) with health authorities and discussions with local bar owners. It was reported that these women are generally outsiders.

- Although it was not possible to determine the incidence of HIV/AIDS in the Afungi Project Site, an attempt was made to assess the levels of knowledge and awareness in that regard through the Household Survey. The majority of households in the Afungi Project Site and Surrounds (approximately 95.5 percent) indicated that they had heard of HIV/AIDS. *Table 9.32* provides a summary of the sources of information about the

disease reported by surveyed households. A large portion of the population had heard of HIV/AIDS via radio (85.7 percent), friends (28.6 percent) or at a health facility (25 percent) (see *Table 9.32*).

Table 9.32 Source of Information about HIV/AIDS According to Surveyed Households

Sources of Information	%
Radio	85.7
Friends	28.6
Neighbours	9.3
Household	3.6
Community activists	3.6
At the Health Post/Centre	25.0
Meetings the Government had with the population	11.4
Other	3.6

Source: Impacto, 2012

Institutional Capacity

- There is limited coverage of antiretroviral treatment (ART) in the District, with access to healthcare and adherence to medications being major challenges.

- The District health service has a limited ability to extend outreach services to the general community, due to a lack of capacity and NGO programmes in the area.

The surveillance of HIV and STI prevalence in the District health statistics is limited, although there is the opportunity to use ANC data to monitor trends in HIV and STI (syphilis as an indicator) in the area.

EHA #5: Food and Nutrition-related Issues

Community Health Needs/Vulnerabilities

- Chronic malnutrition was cited as a significant concern among the provincial health programme managers. Acute malnutrition is not a major issue, and is often associated with underlying health conditions (such as HIV).

- A recent study (2011) found that 53 percent of children were moderately stunted (an indicator of chronic malnutrition) and 26.7 percent severely stunted (INE, Ministério da Saúde, and MDI International, 2012).

- Low birthweight associated with poor maternal nutrition, micronutrient deficiencies (anaemia) and infectious diseases such as malaria and HIV was noted. Low birthweight babies have a higher potential to die, as infants and their long-term cognitive development is markedly reduced.

- Anaemia is a major issue that is also a co-morbid factor in other communicable disease profiles. At a provincial level, 76 percent of children under five years were found to be anaemic, with 5.5 percent reported as having severe anaemia (INE, Ministério da Saúde, and MDI International, 2012).

Institutional Capacity

- The District health authorities have the ability to track trends in acute malnutrition, and could respond to nutritional emergencies with external support.

- There is no effective nutritional surveillance programme to determine the needs of the community. Thus, there are inadequate proactive nutritional support programmes at schools or linked to IEC interventions during ANC.

EHA #6: Non-communicable Diseases

Community Health Needs/Vulnerabilities

- Hypertension was reported to be common in Palma District. It was not easy to manage the disease due to the follow-up requirements, but adherence to treatment is reportedly good in those who do follow up.

- Diabetes is not reported as common, but the health centre in Palma has just received equipment and consumables to support the diagnosis of diabetes, so the case notifications may increase in time.

- Cancers are rare in the District, and are usually detected at a late stage. There is poor awareness and knowledge related to non-communicable diseases (NCDs) in the communities in the Study Area.

Institutional Capacity

- The health services in the Study Area are mainly focused on communicable disease management due to the local burden of disease, so NCDs are, in general, not addressed proactively.

- The health services have a limited ability to manage with an increased burden of disease from different NCDs due to a lack of human resources, diagnostics and inadequate supply chain of medications.

EHA #7: Accidents and Injuries

Community Health Needs/Vulnerabilities

- Road traffic accidents (RTAs) associated with speeding and alcohol misuse are the most common form of injury in the area. The roads in the area are

poor and this generally limits overspeeding, but poor driving techniques and unroadworthy vehicles add to the risk. There are no effective speed controls and active policing is limited to the main towns, due to resource constraints.

- The main road north of Palma to Quionga and Tanzania is the road where most accidents occur. Pedestrian vehicle accidents are also reported. The community, and especially children, have a low awareness of road safety. Off these main roads, RTAs are rare, due to the low volumes of traffic.

- Gender-based domestic violence (GBDV) is reported in the area and, based on information from the FGDs, it is tolerated and even accepted, especially in the rural areas. The root cause appears to be related to alcohol. The health services reported that it was rare for cases of GBDV to be reported to the health centres, either highlighting the stigma of GBDV, or that these incidents do not result in serious injuries.

- Assault and other forms of non-accidental injury were not common. Rape was reported to be extremely rare.

Institutional Capacity

- There is minimal capacity in the local health centres to manage trauma cases effectively. There is no effective pre-hospital ambulance system that responds to incidents, and the capacity of the health centres is limited by a lack of availability of skilled staff, diagnostic equipment and surgical capacity. Thus, the current healthcare system cannot cope with any increase in accidents or injuries.

Policing and related law enforcement is limited in the District, because of a lack of capacity and equipment and no proactive policing.

EHA #8: Veterinary Medicine and Zoonotic Diseases

Community Health Needs/Vulnerabilities

- Zoonotic diseases are poorly recognised and described in the Study Area, due to the limited local veterinary public health services available.

- No cases of rabies were reported from the KIIs.

Institutional Capacity

- There is limited institutional capacity from both the public health and veterinary health perspective to manage zoonotic diseases.

EHA #9: Environmental Health Determinants/Exposure to Hazardous Materials

Community Health Needs/Vulnerabilities

- There is no domestic refuse removal system and, thus, litter is common in most areas, concurring with the socio-economic baseline that the majority of the community are not managing household garbage appropriately (Impacto, 2012). However, the respondents in Quitupo reported that their village was clean, as people bury or burn their waste.

- There is no major industry in the area that created any potential source of pollution. Subsequently, there is minimal exposure to hazardous materials other than the garbage that the community themselves leave in the environment.

- Other than dust from wind, air quality is good and noise pollution is limited to general community noise.

Institutional Capacity

- There is limited environmental health capacity in the local District authority to monitor or support effective environmental controls.

- There is no formal landfill site in the District.

EHA #10: Social Determinants of Health

Community Health Needs/Vulnerabilities

- Mental health is a major consideration, as it relates to the community's perception of well-being and sense of place. This is difficult to document at baseline, as no detailed studies have been performed.

- It is reported that communities live in harmony and that they assist each other as required. The exception was Bairro Moá, where there was a sense of community discord and quarrels were common. There was also discontent with some local tribal authorities, which affected community cohesion.

- Life was described as challenging due to multiple factors, including alcohol abuse. Palm wine is the most common form of alcoholic beverage consumed locally.

- There are no studies on local alcohol or substance abuse, but a national study has found that 28.9 percent of women and 57.7 percent of men consume alcohol regularly, with the prevalence of drinking increasing with age and education in women and with income in men (INE, Ministério da Saúde, and MDI International, 2012). The number of bars in Palma-Sede is increasing, and it is significant that refrigerated bottled beer is now freely available.

- Substance abuse is limited to marijuana abuse, which is reported to be common. Suicide and depression were not reported at all from FGDs or KIIs with the local health authorities.

- Education is a major limitation in the area and, in the FGDs, all women reported a general low level of education. This was evaluated in the socio-economic baseline, where it was reported that 92 percent of women in the households were illiterate (Impacto, 2012).

- Health-seeking behaviour is reported to be poor. There is no evidence on the causes, but access to healthcare and a cultural preference for traditional medicine are likely factors.

Institutional Capacity

- There is minimal local capacity to cope with the potential social ills related to the potential rapid development of settlements in the Study Area.

EHA #11– Cultural Health Practices

Community Health Needs/Vulnerabilities

- Traditional healers (TH) play an important role in healthcare and the treatment of certain problems. Village-level health staff report significant use of traditional healers as well, which often results in the delay of care.

- In the FGDs, it was reported that the use of traditional medicine was common. There are many healers in the communities.

- The women reported generally using health centres in the first instance, and then TH. Perceptions that many health conditions are related to witchcraft or other forms of supernatural influence are common.

Institutional Capacity

- Gaps exist in understanding specific traditional medicine practices in the Study Area.

EHA #12: Healthcare Services and Infrastructure

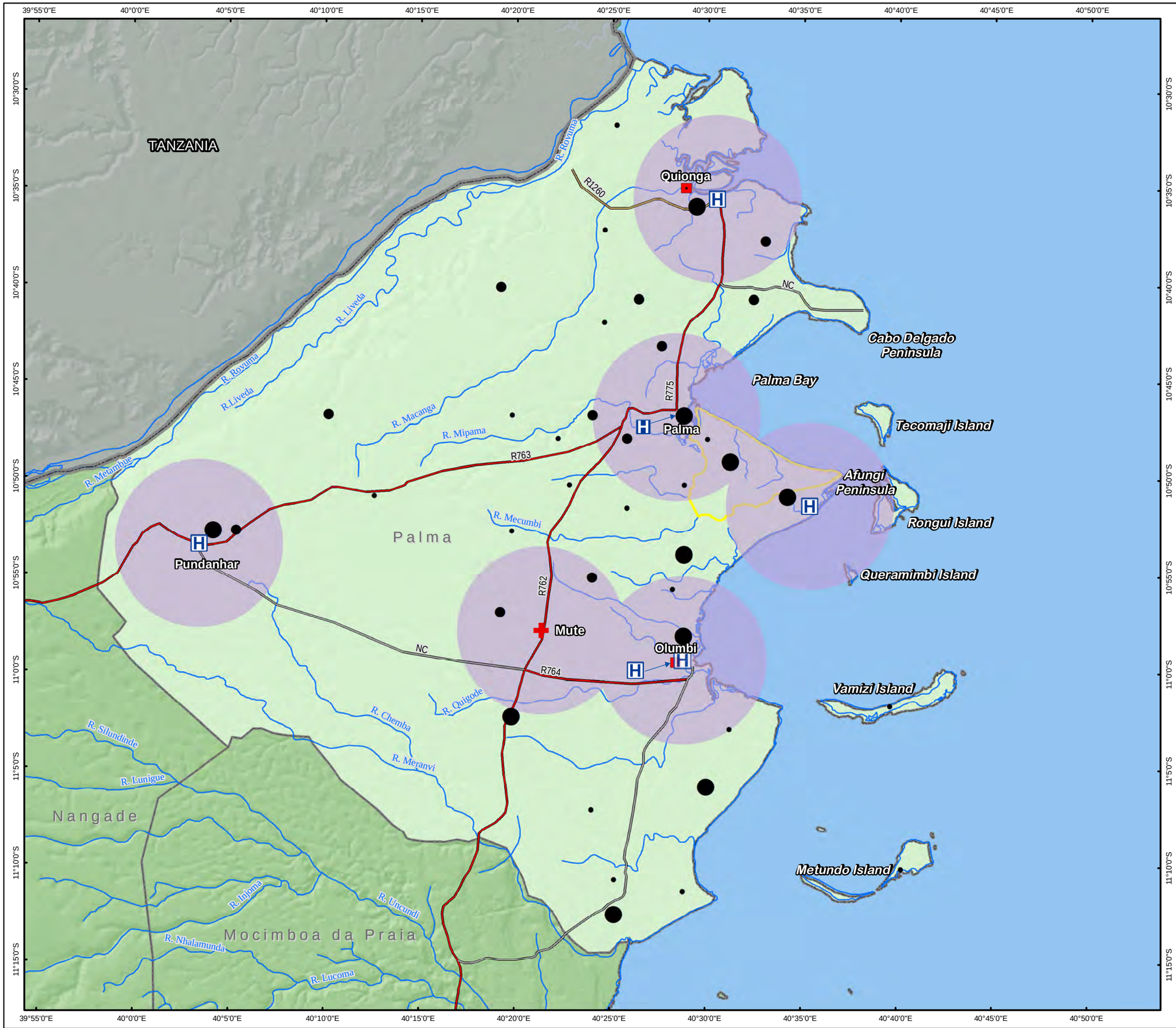
There are six medical facilities in Palma District, including one Rural Health Centre (Type I), four Rural Health Centres (Type II) and one Health Post. The distribution of these facilities is outlined in *Table 9.33* and *Figure 9.21*. The Health Centre of Palma is the only facility with inpatient beds (for children and adults) and services available, such as minor medical procedures and dentistry. All other facilities (with the exception of Maganja Health Centre) are located in the Administrative Post centres and provide outpatient services, have maternity wards and provide mother-child services and vaccinations. Mute Health Post is located in the Locality centre (see *Table 9.33*).

In each Administrative Post, there are many people living more than 8km away from a healthcare facility, and access is further complicated by a lack of public transport and poor road infrastructure (see *Figure 9.21*). The nearest hospital to the population residing in Palma District is the District Hospital of Mocímboa da Praia, located 80km from Palma town, to which patients from the area of Palma requiring major surgery or more specialised medical assistance are referred.

Table 9.33 Health Facilities in Palma District

Name of Centre	Location	Classification	Maternity Ward (No. Beds)	Inpatient Unit (No. Beds)	Consultations		Minor Surgery	X-ray Room
					Outpatient	Dentistry		
Olumbe Health Centre	Administrative Post of Olumbe Headquarters	Rural Type II	9	X	√	X	X	X
Quionga Health Centre	Administrative Post of Quionga Headquarters	Rural Type II	4	X	√	X	X	X
Mute Health Post	Locality of Mute Headquarters	Health Post	X	X	√	X	X	X
Pundanhar Health Centre	Administrative Post of Pundanhar Headquarters	Rural Type II	3	X	√	X	X	X
Palma Health Centre	Palma Town	Rural Type I	16	38	√	√	√	X
Maganja Health Centre	Maganja Village Locality of Mute	Rural Type II	4	X	√	X	X	X

Source: Palma District Services of Health, Women and Social Action, 2012.



Legend

- District Centre
- Administrative Post Centre
- Rivers

Roads

- Tertiary
- Local
- Non Classified
- Afungi Project Site
- Boundary with Tanzania

Province

- Cabo Delgado

- District Boundary
- Palma District

Health Centre

- Health Post
- Rural - Type I
- Rural - Type II

- Coverage Area - 8km

Population Density

- < 500
- 501 - 1000
- 1000 - 5000

MAIN MAP SCALE:

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Kilometers

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Figure 9.21: Distribution of Health Facilities in Palma District (2011)

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 330 000

DRAWING: Distribution of Health facilities in Palma District 2011.mxd

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Impacto Projectos e Estudos Ambientais

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Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

SIZE: A3

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Access to health services in the Afungi Project Site and Surrounds is very poor since (with the exception of Maganja Health Centre) all healthcare facilities are located at Administrative Post centres. There are volunteer health workers in the communities, referred to as First Responders/APEs who receive support from the Department of Health.

Community Health Needs/Vulnerabilities

- The capacity and quality of healthcare services is limited in the Study Area, with the highest level of healthcare being a District health centre (level 1). This building has recently been refurbished, and the level of care appears adequate for the intended scope of service. Access from rural areas is limited, due to poor roads and lack of a public transport system. The referral system to Mocímboa da Praia is lengthy, as there is only one ambulance in the entire District.

- The supply chain for the District health centres, and specifically the rural centres, is erratic, with frequent stockouts reported by healthcare workers.

- Medical waste management is poor, and there is a challenge with water supply, which influences infection control capacity.

- No healthcare facilities are available on the Afungi Peninsula, with the exception of Maganja, although nearly 33 percent of those interviewed in Maganja referred to Palma town as the location of first choice for hospital services. In the other areas, most of the population referred to the Palma Health Centre as the one they use, with the exception of 18 percent of the residents of Quitupo, the production zones and the Coastal Zone inhabitants, who make use of the healthcare facility in Maganja (see *Table 9.34* below).

Table 9.34 Location of Health Facilities Used by the Surveyed Households

District	Quitupo	Quitupo Settlements (Production Zones)	Coastal Zone	Senga	Maganja
Health Post/Centre with Outpatient Services Only (%)					
In the village or neighbourhood	-	-	4.5	25	100
Neighbouring village	18.8	18.8	45.5	-	-
Palma town	75	75	45.5	75	-
Another Administrative Post in the District	6.3	6.3	4.5	-	-
Total	100	100	100	100	100
Health Centre with Maternity Clinic and Hospitalisation Facilities (%)					
In the village or neighbourhood	-		-	-	66.7
Neighbouring village	-		18.2	-	-
Palma town	100		81.8	100	33.3
Another Administrative Post in the District	-		-	-	-
Total	100	0	100	100	100

District	Quitupo	Quitupo Settlements (Production Zones)	Coastal Zone	Senga	Maganja

Source: Impacto, 2012.

The healthcare facilities used by surveyed households are outlined below.

- The Maganja Health Centre is used by the majority of pregnant women in the village of Maganja (93 percent), since it has a maternity clinic.

- According to the social survey, a significant proportion of pregnant women prefer Palma Health Centre as their first choice for perinatal care – Quitupo production zones (88 percent), Quitupo (48 percent), Coastal Zone (59 percent) and Senga (35 percent) – despite the distance of the latter three.

- The First Responder/APE working in the village of Senga is the first point of call for 30 percent of households looking for healthcare for pregnant women, indicating their value in the community.

- For children above the age of five years and adults, the Maganja Health Centre is the first choice for residents of the village of Maganja. Likewise, the Palma Health Centre was the first choice for the residents of Quitupo (54 percent), Quitupo production zones (88 percent), Coastal Zone (36 percent) and Senga (40 percent).

Institutional Capacity

- The health infrastructure network is limited as buildings, equipment and staff appear to be inadequate to serve the healthcare needs of the population.

- There is no ability (in staff, infrastructure and/or supply chain) to cope with a sudden increase in population. This includes emergency services.

EHA #13: Health Programmes and Systems

Community Health Needs/Vulnerabilities

- Although there is extensive NGO activity in Cabo Delgado, there is limited health-related NGO activity in Palma District, with no health interventions reaching the Project area.

Institutional Capacity

- The RHMIS appears to be functional in the District, but it is limited by:

- poor health seeking behaviour (HSB) in the community;
- limited skilled staff;
- limited diagnostic aids; and
- limited recording and reporting.

- The institutional capacity limits the accuracy of reporting and the ability to use the RHMIS as an accurate health monitoring system.

- National disease control programmes (TB, malaria) are inadequately implemented in the District due to a lack of funding, logistics and human resources capacity.

Community Profiling

Potentially Affected Communities

To identify and quantify potential health impacts, an accurate population profile is required. Besides a demographic profile of the at-risk population and the identification of the most vulnerable groups, it is crucial to understand how the Project's activities are likely to impact at both the household and community level.

For the purposes of this baseline, the population who may be affected by the Project are divided into similar exposure groups, or potentially affected communities (PACs). The following seven PACs have been defined:

- Palma District Study Area:
  - PAC 1: Palma-Sede and its different *bairros* (neighbourhoods),
  - PAC 2: populations in the Afungi Project Site who may be potentially resettled,
  - PAC 3: coastal fishing settlements located in the Afungi Project Site and settlements designated as production zones, which may be resettled due to the Project's activities. These are recognised as different to PAC2, due to their use as fishing centres,
  - PAC 4: Senga. This community is located just outside the Afungi Project Site and may be impacted through altered access and influx,
  - PAC 5: Maganja. This community is located just outside the Afungi Project Site and may be impacted through altered access, and
  - PAC 6: communities in the broader Study Area (potential indirect impacts) – Olumbe, Quionga, Mondlane and Mute; and

- Transportation routes:
  - PAC 7: transportation routes and other linear features.

It is recognised that these PACs are a working model, which may evolve and change as the Project progresses, as they may be influenced by various social and biophysical factors. *Figure 9.22* and *Figure 9.23* consider the rough spatial arrangement of the different PACs, as listed above in the broader District and area of Afungi Peninsula.

Vulnerable or Indigenous Groups

Women, young girls, disabled people and the elderly are seen as particularly vulnerable groups in the local setting. Access to and ownership of land also plays a role. There are no self-identifying marginalised ethnic or religious groups in the Study Area. It is anticipated that the social and economic studies that are underway will describe vulnerable and marginalised groups further.

Table 9.35 Stakeholder Comments or Health Concerns in Potentially Affected Communities

Variables	Health Outcomes/ Determinants	Potential Causes or Contributing Factors
What are the main health challenges in the community?	**Malaria** This is the biggest recognised public health challenge, and accounts for around eight out of every 10 children's consultations and half of all consultations in adults in the health centres.	• Breakdown in the supply chain for diagnostic and treatment drugs and supplies is a contributing factor for all health issues. • Limited capacity to diagnose and treat malaria effectively at the village level. • Lack of ability to roll out the full malaria control policy effectively in remote rural areas. However, in spite of limitations, malaria is reducing at the local level. • Poor environmental health conditions in communities promote mosquito breeding and disease transmission. • Poor knowledge in disease prevention and poor health-seeking behaviour increases morbidity and mortality.
	Diarrhoea and associated water and sanitation-related diseases	• These diseases are associated with malnutrition, poor sanitation, poor hygiene and water quality/quantity. • There is a lack of access to potable water and effective sanitation services in most communities. Most communities do not have latrines. The sandy soil in the community and high water table limits the ability to construct even basic pit latrines. • Unprotected wells or surface sources are used for drinking water. This is especially a challenge when the households reside in the fishing areas or production zones. • Cholera outbreaks have occurred in previous years (2009, 2010), which highlights the susceptibility of the communities to outbreaks of severe diarrhoeal disease, linked to poor sanitation. • Urogenital schistosomiasis was raised as a concern, especially in the communities on Afungi Peninsula. The wetland areas in the Study Area are likely high-risk zones where disease transmission may occur. This water-contact disease again highlights the potential poor water use and sanitation practices in the area. • There is limited local knowledge regarding disease prevention, and hygiene practices are inadequate. • Eye and skin diseases are common, and are again linked to poor hygiene practices.
	Increasing rates of STIs and	• Commercial sex work is increasing, especially in Palma. There is currently no real link of

Variables	Health Outcomes/ Determinants	Potential Causes or Contributing Factors
	HIV/AIDS	commercial sex work to Project activities. • There are a number of new bars and guesthouses developing in Palma. The CSWs are increasingly using these as bases to attract clients. • Polygamy and infidelity are reported to be common in the local communities, and complex sexual networks occur. • STIs are reported to be common. However, sexual contact tracing is poor in patients diagnosed with STIs. Use of traditional medicine limits health-seeking behaviour for STIs. • Teenage pregnancy is a major social and health issue, and an increasing trend. There is also an associated increase in STIs/HIV in this young age group. • There is limited local awareness and knowledge related to practices and behaviours to reduce high-risk sexual contact. • Women and young girls are particularly vulnerable to high-risk sexual practices due to local cultural influences, and they have limited negotiating ability for safe sex practices. • Condom availability, knowledge and use is limited, due to a lack of education and cultural/religious preferences.
Stakeholder comments on potential negative impacts of the Project on the community		• Increase in malaria from outsiders moving in – sleeping outside at night while looking for living space, increase in breeding sites, limited local capacity to diagnose and treat an upsurge in cases. • An increase of malaria in the workforce, especially in night-shift workers, may give rise to a larger circulating reservoir of the disease with increased local transmission. • Increases in STIs and HIV/AIDS from an influx of people to the area, movement of CSWs from other geographic locations where there may be higher rates of STIs and HIV, which may promote increased local transmission. • Increases in teenage pregnancy. • Increased water shortages as a result of increased competition. • Increased diarrhoeal diseases from the influx of people into villages, adding to the prevailing poor sanitation situation. This has the potential to increase the risk for epidemics of cholera and dysentery. • Increases in food shortages and malnutrition due to the displacement of people, and also rising costs in the area.

Variables	Health Outcomes/ Determinants	Potential Causes or Contributing Factors
		• The potential for resettlement is unknown at present, but was a highlighted concern due to altered access.
Stakeholder comments on potential positive impacts of the Project on the community		• Improvements in local income. • Enhanced business opportunities. • Potential improvements in health systems and capacity through Project support due to Project impact.

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TANZANIA

Quionga

R1260

Quionga

PAC6

NC

PAC4

Cabo Delgado Peninsula

Palma Bay

R775

Palma

PAC1

Palma

PAC3

Tecomaji Island

R763

PAC2

Afungi Peninsula

Senga

Maganja

PAC8

Pundanhar

Rongui Island

Queramimbi Island

R762

PAC6

PAC5

Mute

Olumbi

Pundanhar

NC

PAC7

R764

Vamizi Island

Olumbe

Nangade

Metundo Island

Mocimboa da Praia

Legend

- Villages
- District Centre
- Locality Centre
- Administrative Post Centre

Roads

- Tertiary
- Local
- Non Classified

Afungi Project Site

Province

Cabo Delgado

District Boundary

Palma District

Administrative Post Boundary

Main Marine Access Routes

- Route for Tourism Operators
- Transportation of passenger and goods

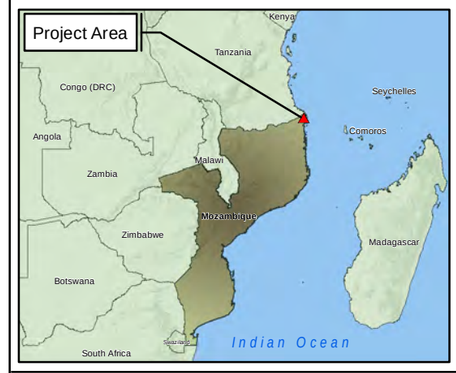

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Figure 9.22:
Potentially Affected Communities (PAC) in Palma District

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 330 000

DRAWING: Potentially Affected Communities in Palma District.mxd

REV: A

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Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

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10°46'0"S 10°48'0"S 10°50'0"S 10°52'0"S

Porto de Palma
Palma
PAC 1
Ngodje
Ngodje
Palma Bay
PAC 3
Barabarane
Ntaunadje
Milamba 2
Milamba1
Quitupo
Nambuimbui
Nacabande
Nsemo/Kibundju
Quidjeri
PAC 2
Nfunzi
Afungi Peninsula
Quitunda
Nsenga
PAC 4
PAC 2
Namacande
Maganja
PAC 5
Patacua

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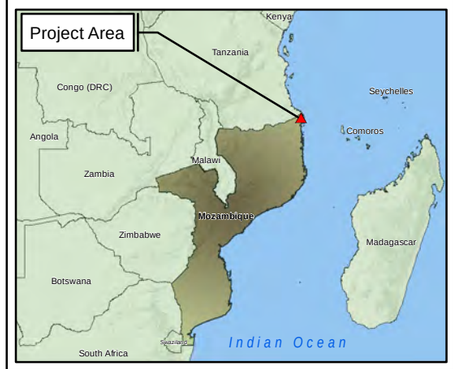
Legend

- Administrative Post Centre
- Villages
- Settlement (production zone)
- Settlement with Fishing Centre
- Fishing Centre
- Local Roads
- Afungi Project Site

Land Cover and Land Use

- Farming Areas
- Coconut Plantation
- Coconut Plantation with Human Occupation
- Human Occupation
- Mosaic of Floodplain and Farming Areas



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Kilometers

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TITLE:

Figure 9.23:
Potentially Affected Commmunities (PAC) in Afungi Peninsula

CLIENT:

Anadarko Moçambique Área 1, Lda
eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 52 000

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9.13.3 Water Supply and Sanitation

Palma District

Palma District has a small water supply system located in Palma town. This is supplemented by a number of other sources such as open wells, rivers, creeks, boreholes with handpumps and other surface water sources such as rivers, streams, lakes, lagoons and pans. The 2007 Census showed that the vast majority of households in the District rely on unprotected water sources such as open wells (60.1 percent); rivers, lakes and lagoons (7.2 percent); and other unspecified sources (1.6 percent). The proportion of households relying on protected water sources is 31.2 percent, out of which 27.6 percent utilise covered wells, 3.4 percent utilise boreholes with a handpump and 0.2 percent depend on water from the main water system in the town. *Table 9.36* shows the sources of water available in the District in 2011 and outlines the availability of these sources.

Table 9.36 Sources of Water in the District by Administrative Post, 2011

Location	Wells		Boreholes with Handpumps		Total		
	Op	Not Op	Op	Not Op	Op	Not Op	Total
Palma District	26	9	53	17	79	26	105
AP Palma Centre	9	5	30	10	39	15	54
AP Olumbe	6	3	17	05	23	8	31
AP Quionga	9	1	2	0	11	1	12
AP Pundanhar	2	0	4	2	6	2	8

Key:
Op: Operational.
Not Op: Non-operational.
AP: Administrative Post.

Source: Palma District Services for Planning and Infrastructures, 2011.

The authorities in Palma District have been actively working with the Spanish Cooperation and the Millennium Challenge Corporation as donors of the water sector, and with FH, JAM and Cowater as implementing organisations, to provide communities with protected water sources. This is achieved through the construction of boreholes with handpumps (1).

Basic sanitation in Palma District is a challenge, as 79 percent of the households reportedly have no access to sanitation facilities. Most of these households use the bush and beaches for sanitation purposes. Even so, of those who own a sanitation facility, only a few had a safe facility (0.3 percent

(1) The National Water Policy (PNA) determines that the source of water must be applied for by the community, which must organise itself to contribute part of the costs and select the group who is going to ensure community management of the source, as well as its maintenance and repair.

who use improved/pit latrine), while 19.7 percent of the District's households had a traditional latrine, which is an unsafe sanitation facility [1] (INE, 2010e).

Afungi Project Site and Surrounds (Including Senga and Maganja)

There is no formal water system in the Afungi Project Site and Surrounds, and households use various water sources including wells with handpumps (45 percent), open wells (25 percent), community boreholes (17.1 percent) and pools in the lowlands (7.1 percent). These water sources are used for both drinking water and for domestic purposes (*Figure 9.24*). There are two boreholes with pumps in Senga, one borehole with a pump in Quitupo, and four in Maganja. The boreholes in Maganja reportedly produce brackish water. Women using 25 litre plastic containers usually collect water from these water sources. In order to reach their primary water sources, residents travel an average of seven minutes each way, and they wait approximately five minutes at the source to draw water.

Figure 9.24 Water Sources

Borehole in Quitupo Village | Community shallow water well in N´semo

Source: Impacto, 2012.

Sanitary facilities (improved latrines and safe sanitary facilities) are insufficient and almost non-existent in the surveyed households. Approximately 81 percent of the households do not have sanitation facilities and instead use the bush, while 10 percent have traditional pit latrines and 8.6 percent use the beaches. Field observations noted that many households have bathrooms, as shown in *Figure 9.25*. These are built using palm or coconut tree leaves, but are only used for bathing purposes.

As opposed to access to safe water, access to sanitation and good waste disposal practices are not a priority identified by households to improve their welfare and health status. This highlights the importance of raising awareness of household hygiene knowledge, practices and behaviours.

(1) A traditional latrine consists of an open pit closed with some sticks, while an improved latrine consists of a pit covered by a slab with a cover that can be manually removed and closed.

Figure 9.25 Local Traditional Bathroom

Source: Impacto, 2012.

There are no formal waste disposal sites available in the Afungi Project Site and Surrounds, and 49.3 percent of the surveyed households reported that they dispose of their waste in open fields (see *Figure 9.26*). A further 13.6 percent reported that they bury waste, 13.6 percent dump waste in the bush, 11.4 percent burn their waste and 9.3 percent use the informal community waste dumping area. In fishing communities, waste generated from fish processing is usually discarded nearby or just left on the ground. This causes bad odours in the villages and poses a threat to community health.

Figure 9.26 Example of Littering

Source: Impacto, 2012.

9.13.4 Electricity and Main Energy Sources

Palma District

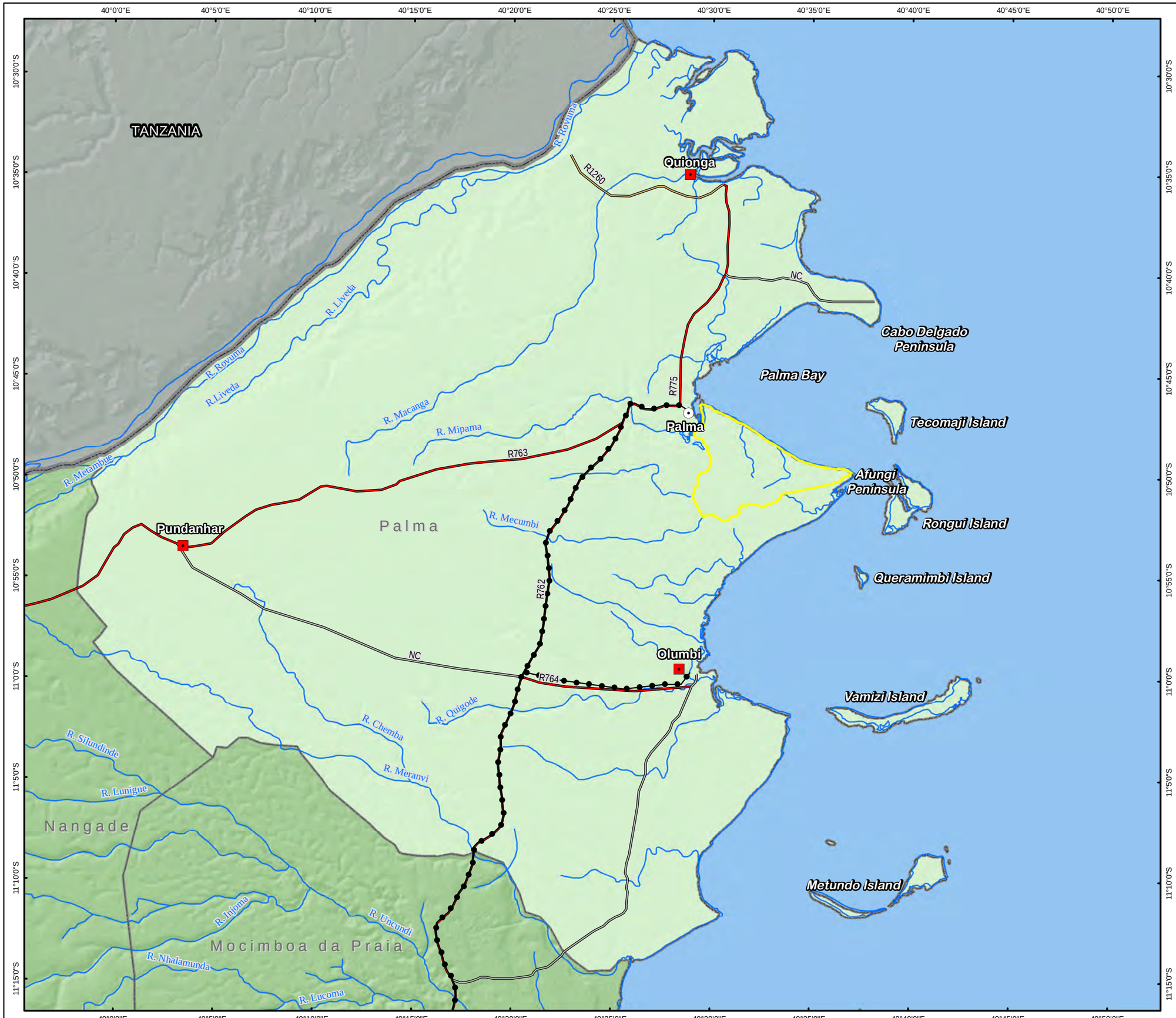
Palma District receives electricity from the national grid via a 33KV line that extends from the Auasse substation in the District of Mocímboa. However, as shown in *Figure 9.27,* only Palma town, Olumbe Administrative Post Centre and some villages located along the power line corridor have access to electricity. There was a plan for the network to be extended to the coastal village of Maganja, as well as to the village centre of Pundanhar, but this project was never completed. According to the 2007 Census, less than 1 percent of households in the District use electricity as their main source of lighting (INE, 2010e).

The majority of the households rely on sources of energy other than electricity, including petroleum, paraffin or kerosene (73 percent); firewood (25 percent); candles or batteries (1 percent); and generators, gas and solar panels (less than 1 percent).

Afungi Project Site and Surrounds (Including Senga and Maganja)

There is no electricity in the Afungi Project Site and Surrounds and, according to the authorities, there are no plans to connect the areas in and around the Site to the national electric grid. Surveyed households mainly use wood fuel for cooking (99.3 percent), which women gather in the surrounding forest areas, while 0.7 percent use coconut palm fronds. For lighting purposes, households mainly use petroleum products (47.9 percent) and battery-operated flashlights/lamps (44.3 percent). Individual solar panels are used in some stores and even in a few residences; however, this source of energy is primarily used to power televisions (1).

(1) An entrance fee is charged and this is another income-generating activity for some individuals.



Legend

- District Centre
- Administrative Post Centre
- Rivers

Roads

- Tertiary
- Local
- Non Classified

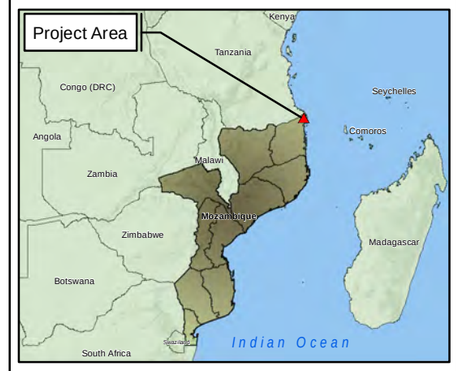
- Afungi Project Site
- Boundary with Tanzania

Province

- Cabo Delgado

- District Boundary
- Palma District

- Power Transmission Line (33kV)



MAIN MAP SCALE:

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Kilometers

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TITLE:

Figure 9.27: Electricity Distribution in Palma District

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 330 000

DRAWING: Electricity Distribution in the District.mxd

REV: A

ERM
Great Westerford Building
240 Main Road
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Tel: +27 21 681 5400
Fax +27 21 686 073

Impacto Projectos e Estudos Ambientais

ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

SIZE: A3

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9.13.5 Roads, Transport and Communications Network

Road Network

The road network of Palma District covers approximately 256km in total, and is poorly developed and in bad condition. It consists of tertiary roads, feeder roads and non-classified roads (typically unpaved) (*Figure 9.29*). The tertiary road network connects Palma with the neighbouring districts, the City of Pemba and the other provinces within the country. There is limited connection between Palma town and other centres in the Administrative Post.

The main roads in the District are:

- R762, connecting Pemba to Palma and continuing to Quionga via the R775 (22km);
- R763, which starts at the intersection with the R698 that comes from Mueda to Nangade (Imbuo) and then runs towards Pundanhar and Palma (160km); and
- R764, which starts at the intersection with the R762 in Palma and runs to Olumbe (15.7km).

Other important roads in the District comprise the following feeder and non-classified roads, which are also of poor quality:

- R1260, which connects Quionga to Namoto and the Rovuma River at the border with Tanzania;
- a non-classified road starting at the intersection with R775, which connects Palma to Quirinde; and
- a non-classified road starting at the intersection with R762, which connects Palma with the villages of Senga, Quitupo, and Maganja.

The improvement of the road network in the District is ongoing and focused on repairing and paving the roads linking Mocímboa da Praia with Palma (R762), Palma with Quionga (R775) and Quionga with Namoto on the Tanzanian border [(1)] (R1260), and will certainly enhance the movement of people and goods between the two countries. In addition eni is investigating upgrading the road between Pemba and Mocimboa da Praia.

Sea Transportation

As previously mentioned, the road network in Afungi Project Site and Surrounds is of poor quality and, as such, there is a general lack of public

[1] The contractor is ZAGOPE, a Brazilian company that will construct a 230km paved road from scratch between Mueda Town (in Moeda District) and the border with Tanzania in Namoto, north of Palma Town. The road is financed by the Portuguese Government (85%) and the Government of Mozambique (15%), and is planned to be concluded in March 2014.

transportation services in the area. As a result, some local people make use of boats to transport goods and people along the coastline and to and from Tanzania. Due to the high costs (about 50 MZN per passenger), only a small percentage of people (6 percent) make use of the boats for transportation. *Figure 9.29* shows the primary boat transportation routes along the coast of Palma District, and *Figure 9.28* below illustrates some examples of goods and modes of transport used.

Figure 9.28 Sea Transportation of Goods and People

Transporting stakes on the Ngodje coast

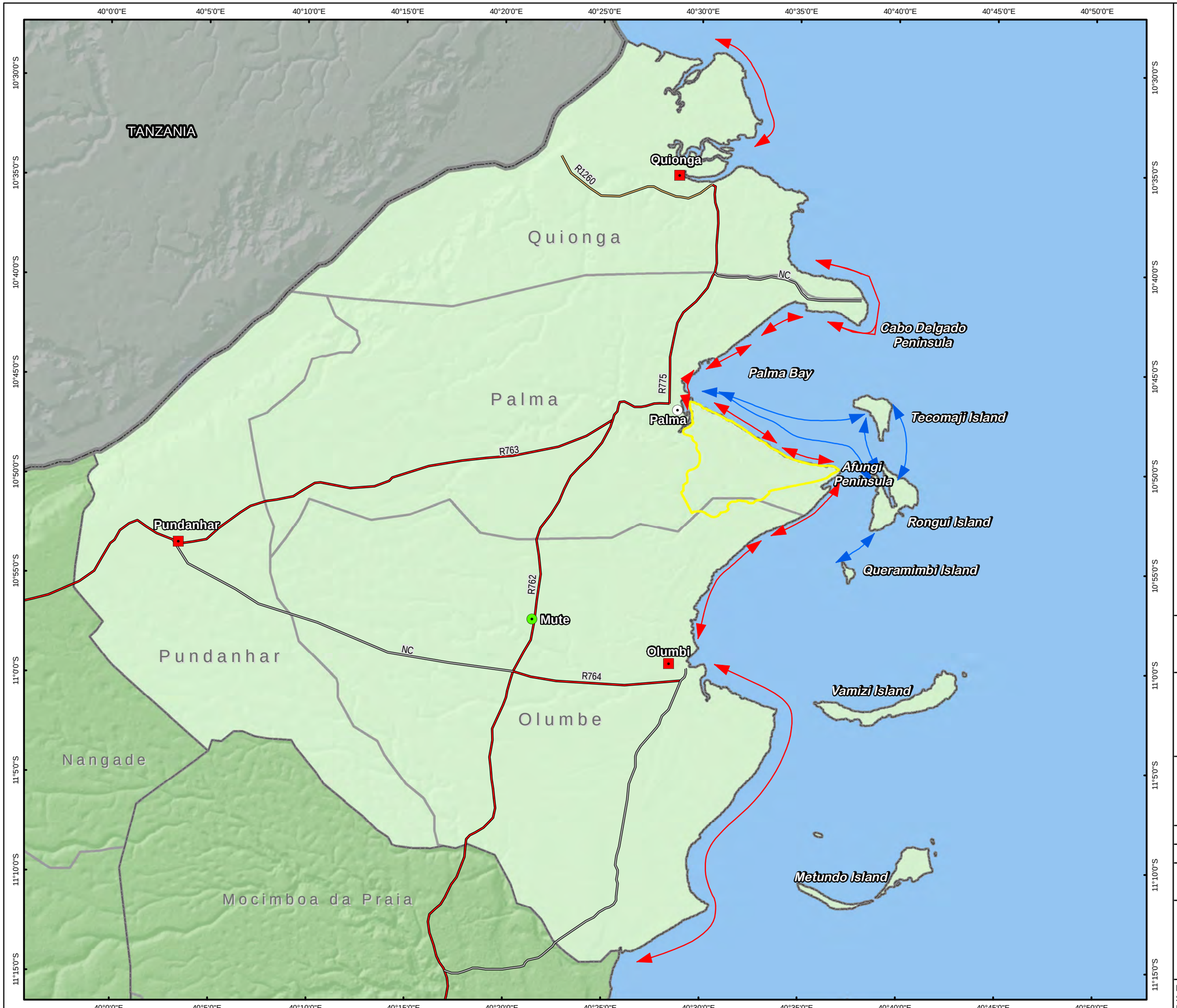
Transportation of farm products to a vessel in the N'gala Fishing Centre

Transport vessel property of a transporter resident in Milamba 2

Vessel transporting construction materials along the coast between Olumbe and Maganja

Woman transporting goods to a boat in Milamba 2, and a boat transporting people near the coast of Ngodje

Source: Impacto, 2012.



Legend

- District Centre
- Locality Centre
- Administrative Post Centre

Roads

- Tertiary
- Local
- Non Classified

- Afungi Project Site

Province

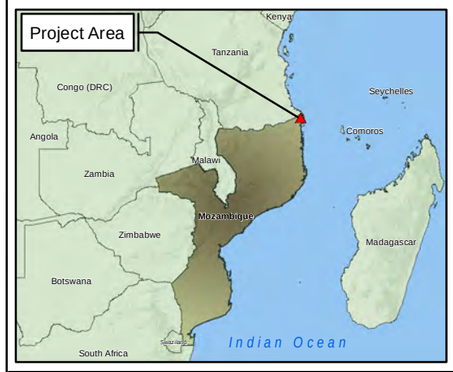
- Cabo Delgado

- District Boundary
- Palma District

- Administrative Post Boundary

Main Marine Access Routes

- Route for Tourism Operators
- Transportation of passenger and goods



MAIN MAP SCALE:

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Figure 9.29
Transport Routes in Palma District

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 330 000

DRAWING: Transport Routes in Palma District.mxd

REV: A

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Impacto Projectos e Estudos Ambientais

ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

SIZE: A3

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Transportation

The main means of transport used in Palma District are semi-public minibuses and pickups owned by private operators, and boats (1) (2). In 2011, the District had seven private transport services, covering the three following road routes:

- Mocímboa da Praia – Palma – Namoto;
- Olumbe – Mocímboa da Praia; and
- Palma town (District Centre) – Pundanhar–Nangade (a neighbouring district).

Given the poor road network and infrastructure, especially for the communities living along the coast, an alternative mode of transportation of people and goods is by sea, along the coast between the districts of Palma and Mocímboa da Praia, Nacala (in Nampula Province) and to Tanzania to the north (*Figure 9.29*). Boats are the main vessels used for sea transportation and, in 2011, there were 15 licensed boats operating along the coast (12 without outboard motors and three with outboard motors). There are also unlicensed boats operating along the coast. There is no further information available to enable a more detailed description of the local transportation baseline.

Communication Network

There are three mobile communication networks operating in Palma District: Mcel, Vodacom and Movitel (3) . Mcel and Vodacom are accessible in a radius of approximately 15km within Palma town and its surrounds. Movitel coverage is expanded to Mute Locality, Quionga and Pundanhar Administrative Posts. No land-based telephone network exists within the District.

9.14 *PALMA DISTRICT AND AFUNGI PROJECT SITE ECONOMIC ACTIVITIES AND LIVELIHOODS*

9.14.1 *Employment Status of the Population*

Palma District

The current level of economic development remains very low, the survival strategies of the population are primarily subsistence-based, and the local economic market is underdeveloped and served by small informal operators.

Table 9.37 summarises the economically active population by employment position and economic sector of activity. Nearly 86.5 percent of the

(1) Interview with District Service for Planning and Infrastructure, January 2012.
(2) Interview with District Service for Planning and Infrastructure, January 2012.
(3) As of February 2013.

economically active population of Palma District work in the primary sector, ie in agriculture, forestry, fishing and extractive activities, while the tertiary sector accounts for 9.3 percent, which includes those involved in commerce, finance and administrative services. Similar to the province, the secondary sector is not well developed in the District (INE, 2010c).

The majority of the population (87.1 percent) are self-employed workers (meaning people who work independently, rather than being formally employed, or working with other people) and non-remunerated household workers (8.6 percent) [1]. The proportion of the population employed in the public and private sector is small, corresponding to 1.6 and 1.3 percent respectively.

The majority of those working in the primary sector are self-employed or non-remunerated household workers, representing 89.6 percent (18,899 out of 21,099 inhabitants) and 8.5 percent (1,786 out of 21,099 inhabitants) of the sector respectively, and this includes the vast majority of subsistence farmers and fishers of Palma District [2]. The majority of those who work in the tertiary sector are also self-employed andinvolved in informal business. These account for 68 percent of the sector (1,554 out of 2,273 inhabitants).

Formal employment is scarce and is mostly provided by the State (roles include public officials of local administration, teachers and health professionals) and the private sector. Waged employment provided by the private sector is limited to those employed by tourism operators and those who gain temporary work offered by ongoing developments.

Table 9.37 Economically Active Population (15 Years or Older) in Palma by Sector and Employer, 2007

	Total Residents	% Sector of Activity	State Employee	Private Company Employee	Self - employed Worker	Non-remunerated Household Worker
Total residents	24,353		399	327	21,203	2,084
% Employment position		100.0	1.5	1.3	87.1	8.6
Agriculture, forestry, fishing and extractive	21,099	86.6	50	151	18,899	1,786
Industry and energy	479	2.0	10	12	432	16
Construction	179	0.7	17	82	70	6
Transport and communications	73	0.3	11	17	42	
Services	2,273	9.3	306	60	1,554	260
Unknown	250	1.0	5	5	215	16

Source: INE, 2010c.

[1] Non-remunerated household workers is a category used by the INE to capture people aged 15 or older who work for a household without remuneration, in most cases in farming and domestic activities. Generally, they live as a member of the household, sleeping and eating under the household's responsibility. In some cases, they are indirect relatives (nephews or nieces, for example) who live under the protection of the household.

(2) The INE data does not allow a more detailed breakdown to determine the number of fishers.

Palma District has a number of economic development opportunities given its available natural resources such as land, forests, wildlife, mineral and fishing resources, as well as beaches and islands surrounded by coral reefs. The potential of these resources remains underdeveloped, and the current patterns of development have not led to substantial improvements in living conditions in the District. Other potential development projects offering potential economic opportunities to offer are still in an early phase, eg exploration for hydrocarbons and various tourism projects.

Afungi Project Site and Surrounds (Including Senga and Maganja)

The Afungi Project Site and Surrounds have typically rural characteristics, and economic activities are essentially within the primary sector (eg agriculture and fishing). Livestock rearing (mainly goats and poultry) is practised on a small scale, and is an activity that families conduct mostly by habit and tradition.

Due to the lack of formal employment opportunities at a local level, men of working age often migrate to the main villages and nearest towns to seek paid temporary work. Informal commerce is also observed in the area, providing cash income to some households.

Table 9.38 contains a summary of the main occupational activities of the heads of households and their wives, confirming that agriculture and fishing are the dominant work activities.

Table 9.38 Main Occupations by the Head and Wife of Surveyed Households

Main Occupations	**Head of Household (%) [1]**	**Wife of Head of Household (%) [2]**
Works for others	4.3	0.8
Self-employed/small industry	4.3	0.8
Self-employed/preparation of food, drink	2.1	0.8
Self-employed/construction materials	4.3	3.1
Self-employed/commerce	8.6	0.8
Agriculture	50.0	85.0
Fishing using boat/net	21.4	2.4
Fishing without boat/net	2.9	2.4
Employed fisherman (paid in cash/in kind)	-	0.8
Other	2.1	0.8
Does not know/Did not answer	-	2.4
Total	100.0	100.0

Note:
[1] 140 heads of households were surveyed.
[2] 127 wives of heads of households were surveyed.

Source: Impacto, 2012

Some key observations are outlined below:

- Subsistence farming is the primary activity for 50 percent of the heads of households, followed by fishing, which is undertaken by about 24 percent of heads of households.

- The type of agriculture practised is subsistence farming, and there is no commercial farming taking place (1).

- Approximately 21 percent of fishermen use boats and/or nets.

- Self-employment activities as a whole are practised by approximately 19 percent of the heads of households, and these consist primarily of informal commerce activities.

- Waged work is not very common, and is only reported by approximately 4 percent of the heads of households.

- Approximately 85 percent of women are involved in subsistence agriculture. In some instances, wives are involved in fishing and self-employment activities, as reported by approximately 5 percent of the wives.

The primary occupations of heads of households in each of the settlement areas can be summarised as follows (see *Annex G, Table 1.7*):

- Most of the surveyed households are involved in agriculture, primarily in areas such as Senga (95 percent), Quitupo Settlements (production zones) (68.8 percent) and Quitupo (50 percent). An exception to this is the Coastal Zone, where the two most significant activities are fishing and commerce, in which approximately 32 and 23 percent of the households respectively are involved.

- Fishing is also an activity undertaken by households living in the interior zones, such as Quitupo Settlements (production zones), where approximately 25 percent and 19 percent respectively of the heads of households fish as their primary activity.

- Fishing activities are also closely related with the tradition of certain ethnolinguistic groups (ie the Makwé and Mwani). In Senga, where the population is primarily Makonde, none of the heads of households reported fishing to be their primary activity.

The following subsections provide a detailed description of the most important economic activities within the Afungi Project Site and Surrounds (including Senga and Maganja).

(1) The analysis of household income, included later in this report, will validate this affirmation.

9.14.2 Agricultural Production and Services

Palma District

Although fishing represents an important income-generating activity for the inhabitants of Palma District, in particular for those residing close to the coast, agriculture continues to be the one activity that involves the majority of the population. Most agricultural activities are of a small scale and are undertaken for subsistence purposes, which is also consistent with trends in the province. Surplus production is sold. Some households are engaged in the production of cash crops such as coconuts, cashews and, more recently, sesame seeds.

The most commonly grown crops are maize, cassava, peanuts and beans, and these are cultivated in the highlands, although soils within the highlands are typically sandy and have low productivity. Rice, sweet potatoes and horticultural products are cultivated in the lowland areas, generally located along the drainage lines and alluvial plains of rivers and streams, where soils are typically rich in nutrients.

Land is cultivated in a rain-fed regime over two seasons; the first season begins from October to November to prepare the plots for food crops as maize, rice and beans, and the second from March to April to prepare for sweet potato and vegetables. Manual watering is practiced on horticultural products cultivated on lowlands. Women are most active in crop farming and generally tend to their crops on a daily basis.

In accordance with the District's 2011 Economic and Social Plan Annual Balance, the 2010–2011 agricultural campaign aimed to cultivate a total of 44,129ha across the District, of which 40,919ha were planned for food crops and 3,210ha for sesame, as shown in *Table 9.39* (Government of Palma District, 2012).

Cassava is the main crop cultivated, occupying the largest area and having the highest volume of production. Rice is the second-most commonly cultivated crop. Out of an anticipated production of 165,847t of crops for the 2010–2011 campaign, the District ended with a total production of 167,232t.

Table 9.39 Agricultural and Cultivated Areas in Palma District (2010–2011)

Crops	Planned Area (ha)	Prepared Area (ha)	Sowed Area (ha)	Anticipated Production (t)	Production Achieved (t)	Average Production (t/ha)
Maize	7,702	7,714	7,714	13,864	13,885	1.8
Rice	8,238	8,254	8,254	14,828	14,857	2
Sorghum	3,910	3,905	3,905	2,737	2,734	1
Beans	3,035	3,029	3,029	2,074	2,090	2
Groundnuts	2,093	2,094	2,094	1,256	1,256	1
Cassava	15,734	16,275	16,275	128,872	130,200	8
Vegetables	39	44	44	156	176	4
Sesame	3,210	3,150	3,150	1,284	1,260	0

Crops	Planned Area (ha)	Prepared Area (ha)	Sowed Area (ha)	Anticipated Production (t)	Production Achieved (t)	Average Production (t/ha)
Sweet potatoes	168	172	172	764	774	5
Total	44,129	44,595	44,595	165,847	167,232	

Source: Government and Palma District Service of Economic Activity, 2012.

The agricultural extension services network is small for the number of households residing in the District, with only four technical stuff available, of whom two are public officials and two are from FH, assisted by 19 farmers working as extension monitors.

In general, agricultural productivity levels are low (1), and the District government and its partners (eg FH) are engaging in activities to foster production, productivity and the diversification of crops. These activities include the distribution of seeds (such as maize, rice, cowpea/nhemba bean, peanut and sesame), the distribution of cashew tree seedlings and the spraying of cashew trees, and the promotion of linkages between farmers and the market.

Afungi Project Site and Surrounds (Including Senga and Maganja)

Agricultural activities are the primary livelihood source for households in the area, and rudimentary farming practices such as slash-and-burn agriculture are still widely practised.

Agricultural Calendar and Division of Labour

Most farming is subsistence in nature and is undertaken by all members of the household (including children). Field tilling and preparation are normally the male's responsibility; however, planting is performed by both men and women in November–December during a season with normal rains (if the rains are delayed, planting may also be delayed to January–February). Women are responsible for the weeding and cultivation of crops, and men provide support during the final harvest period. Weeding occurs between January and April, also depending on the timing of the rains. Harvesting takes place from May to August (see *Table 9.40*).

Table 9.40 Agricultural Calendar

Activity	N	D	J	F	M	A	M	J	J	A	S	O
Field tilling/preparation												
Planting												
Crop cultivation/weeding												
Harvesting												

(1) The main reasons for low productivity in subsistence agriculture in Mozambique are a result of the labour and technology used (manual labour and slash-and-burn practice), deficient storage of harvests, low quality of goods such as seeds, fertilisers and insecticides, and insufficient extension services.

Activity	N	D	J	F	M	A	M	J	J	A	S	O

Source: Impacto, 2012.

Number of Plots per Household

All of the surveyed households have at least one plot of land for farming, with the exception of two households that depended on other activities for subsistence. Analysis indicated that almost half of the surveyed households depend on only one available plot:

- 44.3 percent of the households have one farming plot. In Quitupo, this proportion in much higher, with 87.5 percent of households having one plot;
- 34.3 percent of the households have two plots. In Senga, the proportion is higher, at 45 percent;
- 14.3 percent of the households have three plots. In Senga, the proportion is higher, at 25 percent, and
- 5 percent of the surveyed households have four plots.

Location of Farming Plots

Farming predominantly occurs in the highlands, especially for crops that are rain-fed; those that require more water or humidity are grown in the lowlands. In general, the lowland areas consist of river and stream corridors, where nutrient-rich alluvial plains are formed. The highland areas are generally sandy with lower productivity. The two most important staple food crops, cassavas and rice, are grown in the highlands and lowlands respectively. The other crops produced are peanuts, sweet potatoes, sorghum, maize, beans and vegetables.

Of the households that own two plots (Plot One and Plot Two), more than 60 percent of these are located in the highland areas, and approximately 30 percent in the lowland areas.

In Quitupo and Senga, a greater proportion of Plot One and Plot Two are located in the highland areas, with approximately 79 and 74 percent respectively in Quitupo, and approximately 85 and 71 percent respectively in Senga. This is related to the fact that there is a greater availability of highland plots, which have already been cleared or which could be cleared, in those areas.

In the Quitupo Settlements (production zones) and in the Coastal Zone, where more lowland plots are available and where these are located closer to the settlements, the proportion of Plot One and Plot Two located in the lowland areas is slightly higher. Thus, in the Quitupo production zones, 56 percent of Plot One are located in the lowlands, and 60 and 77 percent of Plot One and Two in the Coastal Zone.

During FGDs, the participants indicated that although the lowland areas are more productive than the highland areas, the latter are more important because they guarantee crops (mainly cassava) for the families for long periods during the year.

Average Size of Farming Plots

Table 9.41 below shows the average usable area owned by each of the households for farming, based on the areas where they live. On average, the surveyed households have 2.4ha of land for farming, and this average is higher in the Coastal Zone and the areas around Quitupo, where the plot sizes average 2.8 and 2.6ha respectively.

Table 9.41 Average Crop Sizes by Area of Residence, in the Afungi Project Site and Surrounds (in Hectares)

	Quitupo	Quitupo Settlements (Production Zones)	Coastal Zone [3]	Senga	Maganja	Total
Average area owned	2.4	2.6	2.8	2.2	2.0	2.4

Source: Impacto, 2012.

Access to Agriculture Extension Services

The agricultural extension services in the Afungi Project Site and Surrounds are weak. No direct and continuous agricultural extension service programmes are provided by the District Services for Economic Activities (DEAS), with the exception of some support provided to cashew nut producers. None of the villages in the Afungi Project Site and Surrounds are involved with the work undertaken by FH.

The availability of seeds and crop-spraying services for cashew plantations in the Afungi Project Site and Surrounds are primarily limited to Palma town. The vast majority of the surveyed households reported that to access these services they must travel to Palma, with some exceptions related to availability of crop-spraying services for cashew trees in Quitupo and Senga (see *Table 9.42*).

Table 9.42 Location of the Seed Supply and Spraying Services as Reported by Surveyed Households

Location	Quitupo	Quitupo Settlements (Production Zones)	Coastal Zone	Senga	Maganja
Seed Supplier (% of Household)					
In the village	22.1	-	4.5	-	3.3
Palma	78.8	93.8	90.9	100.0	96.7
Nearby village	-	6.3	4.5	-	-
Other AP	-	-	-	-	-

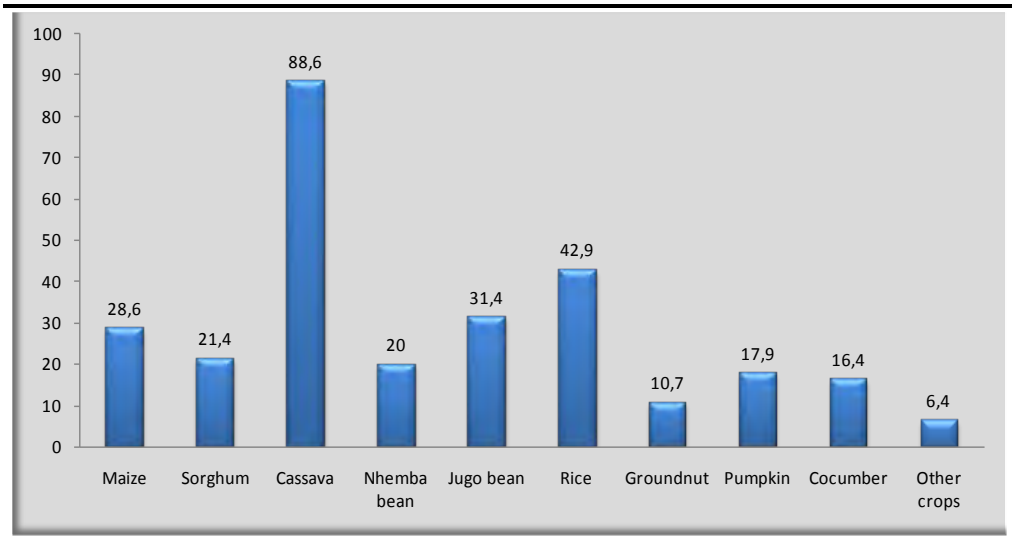
Location	Quitupo	Quitupo Settlements (Production Zones)	Coastal Zone	Senga	Maganja
Other district	-	-	-	-	-
Spraying (% of Household)					
In the village	63.5	-	9.1	25	3.3
Palma	36.5	75.0	72.7	55.0	63.3
Nearby Village	-	25.0	18.2	20.0	33.3
Other AP	-	-	-	-	-
Other District	-	-	-	-	-

Source: Impacto, 2012.

Main Crops and the Sale of Crop Produce

Cassava is the primary crop, grown by 88.6 percent of households, and is cultivated in the highland areas (including Nacabande, Patacua and Senga). The second-most produced crop is rice, grown by 42.9 percent of households, and cultivated in the lowland areas (including Nambuimbui, Ntaunadje and Namacande). Other important crops are the jugo bean, reported by 31.4 percent of the households; maize (28.6 percent); and sorghum (only 21.4 percent) (see *Figure 9.30*). Crops are grown under an intercropping production system, with maize being grown together with beans, cassava and groundnuts. *Table 1.8* in *Annex G* shows crops produced according to the area of residence.

Figure 9.30 Percent of Surveyed Households by Main Crops Produced



Source: Impacto, 2012.

Although found in the Afungi Project Site and Surrounds, vegetables are not widely cultivated. For example, pumpkin and cucumber are reported as being produced by 17.9 percent and 16.4 percent of households respectively, while onion, tomato and lettuce were referred to by only 2 percent. Pumpkin and cucumber are cultivated without an irrigation system, during the coolest

part of the year, and are grown together with other crops such as cassava or maize.

Table 9.43 shows that in the 2010–2011 agriculture season, the sale of cassava, maize, sorghum and rice was practised by few households, since these crops are important to the households food security. For instance, being the most important crop in the diet of local households, cassava is cultivated by most households (88.6 percent), but is the least sold product (13.6 percent of households). In comparison, groundnuts were produced by only 10.7 percent of the households, but this crop is sold by a relatively high proportion of households that grow it (46.7 percent) (1). *Table 1.9* in *Annex G* shows the marketing of crops produced by surveyed households according to their residence area.

Table 9.43 Crops and Annual Income Generated from their Sale, as Reported by Surveyed Households

	Maize	Sorghum	Cassava	Nhemba Bean	Jugo Bean	Rice	Groundnuts
Households producing the crop (%)	28.6	21.4	88.6	20.0	31.4	42.9	10.7
Households marketing the crop (%)	35.9	30.0	13.6	35.7	40.0	25.0	46.7
Average annual income (2010–2011) (MZN)	1,546	2,706	1,907	1,380	1,792	2,176	1,643

Source: Impacto, 2012.

Income generated by the sale of agricultural produce is very low, with the average annual income varying between 1,000 and 3,000 MZN. Agricultural products are sold locally to consumers or transported by the household by foot or boat to Palma town, to be sold to Palma-based traders. Typically, the income obtained from the sale of agricultural products is used to purchase basic household items and clothing.

The reasons for the sale of agricultural products not being significant are:

- underdeveloped markets;
- low crop yield resulting in low surplus to sell;
- lack of transportation services (poor roads and limited transportation); and
- lack of marketing agents to buy surplus production.

Fruit Trees and the Sale of Fruit Tree Produce

(1) Some households that have not produced this crop may have sold produce stocked from a previous agricultural campaign.

Table 9.44 below outlines statistis around the ownership and sale of fruit trees or produce in the area in the 2010–2011 agriculture season. All surveyed households have at least one type of fruit tree. The most common trees grown include cashew, mango and coconut trees, which are owned by approximately 64, 45 and 46 percent of households respectively. Banana, papaya and citrus are owned by fewer households. (*Table 1.10* presented in *Annex G* disaggregates this data by area.)

In general, households own an average of seven mango trees, 94 cashew trees and 59 coconut trees. In Quitupo Village, the average number of cashew trees (83) per household is lower than in the Coastal Zone and in the Quitupo Settlements (production zones), where the households own an average of 171 and 123 cashew trees respectively. Coconut palm trees are mainly found along the Coastal Zone, where approximately 45.5 percent of the households report that they own an average of 196 coconut trees, and in the Quitupo Settlements (production zones), where 56 percent report that they own an average of 76 coconut trees.

Coconut and cashew were the two most significant fruit trees in terms of sales in the 2010–2011 agriculture season (coconut trees also provide leaves that are used for roofing houses, shading crops and producing handicrafts). Coconut trees contribute the most to income, although more households own cashew trees:

- Of the 63.6 percent households that have cashew trees, 18 percent sell their produce and 2.2 percent process/prepare their fruit, resulting in an average annual income of approximately 2,751 MZN.

- Of the 46.4 percent of households owning coconut trees, approximately 51 percent and 5 percent respectively reported to sell or process coconuts, obtaining an average income of approximately 3,032 MZN in the previous 12-month period.

Table 9.44 Ownership of Fruit Trees and the Sale of Fruit

	Banana	**Cashew**	**Papaya**	**Mango**	**Coconut**
Households owning (%)	12.1	63.6	10.7	45.0	46.4
Average number of trees per household	31	94	25	7	59
Households selling (%)	29.4	18.0	20.0	25.4	50.8
Households processing (%)	0	2.2	0	0	4.6
Average annual income (2010–2011) (MZN)	625	2,751	240	900	3,032

Source: Impacto, 2012.

Table 1.11 in *Annex G* resumes sale of fruit and the income reported by households in the 2010–2011 agriculture season, according to their area of

residence. In all each area, sales of coconut provide more income to households resident in those areas:

- The proportion of households selling cashews is higher in the Coastal Zone (30 percent) and in Quitupo (24.4 percent), providing an income of 2,433 and 2,771 MZN respectively.

- In the Coastal Zone, Maganja and Senga, more than 60 percent of the households sell coconuts, resulting in an income of 5,821 MZN (Coastal Zone), 2,100 MZN (Maganja) and 2,233 MZN (Senga).

- Note that in Senga, 60 percent of households report processing and selling *sura* (palm wine), an appreciated traditional alcoholic drink made of coconut or palm tree sap.

Keeping of Livestock

As previously stated, the keeping of livestock is not widely practised in the area. There are no cattle in the area, due to the high prevalence of tsetse fly. Livestock that is kept is used for subsistence purposes and culled for special occasions. The most common livestock are goats, chickens and ducks. *Table 9.45* summarises the ownership of animals for the surveyed households, as well as income generated by those who sold in the past 12 months.

Table 9.45 Keeping of Livestock and Income from its Sale for the Surveyed Households

	Households that Own Livestock (%)	Average No. of Animals	Households that Sold Livestock (%)	Average Income over the Past 12 Months (MZN)
Goats	16.4	9.3	34.8	3,781
Chickens	36.4	8.8	35.3	900
Ducks	2.9	6.0	25.0	1,000

Source: Impacto, 2012.

The selling and consumption of livestock is not common among the households, and only occurs in situations of extreme necessity or when money is needed to purchase other products or services. The prices of goats, chickens and ducks vary between 1,000 to 1,500 MZN, 100 to 150 MZN, and 200 to 250 MZN respectively. There are no markets in the Afungi Project Site and Surrounds where animals are sold, and sellers must wait for buyers to come to the area from different parts of the District or from Tanzania.

9.14.3 Small-scale Fisheries

Palma District

In *Section 9.7.6*, small-scale fisheries were identified as the only important fisheries subsector in Cabo Delgado. In Palma District and the Afungi Project Site and Surrounds, small-scale fishing is an important activity undertaken by

a large number of artisanal fishers for subsistence and income generation, therefore with a strong influence on their livelihoods.

For some, small-scale fishing is commonly practised in addition to agricultural activities (farming, planting of cashew and coconut trees). They are generally fishers without boats, divers and gatherers who fish mostly for home consumption and sell a small part of their catch locally. For others, fishing is their primary activity and although they may partake in agricultural activities. These are generally fishers using boats, and who consume part of and sell a large proportion of their catch. Only a small group can be regarded as small-scale commercial fishers. *Figure 9.32* shows the location of fishing centres in the District.

A number of fishing centres once existed on the islands of Tecomaji, Rongui and Queramimbi. These fishers were relocated to the mainland due to the construction of tourism facilities on these islands (of four fishing centres that existed on Vamizi Island, two still remain; on Metundo Island, only one of the previous two fishing centres remains (1)).

Palma District has a total of 7,447 fishers, representing 23 percent of the total 32,392 fishers in the province (Mozambican Ministry of Fishing, 2008c). *Table 9.46* shows the type and number of fishers in Palma District, in comparison to those in the province. The fishing methods that are most commonly practised are handlines (505), gill nets (164) (2) and seine nets (94). Women represent 21 percent of all the fishers, which clearly indicates that they play an important role in ensuring food security, as well as generating income. Out of 1,558 women who are artisanal fishers in Palma, 53 percent are collectors and 30 percent fish with double stick nets (*quinias*).

Compared with the province, Palma has a higher proportion of fishers with vessels, and some 44 percent of the fishers within the District own a vessel. Furthermore, out of 1,410 divers in the province, 53 percent are concentrated in Palma, highlighting the importance of diving in the District.

The majority of fishers without boats usually operate in areas close to their homes eg next to estuaries, and over coral reefs and sandbanks. They are subsistence fishers and use barriers/traps, double stick nets, handlines and harpoons. Harpoon and handline fishers fish along the shoreline in waters between 0.5 and 1m deep. Most subsistence handline fishers are young people. Collectors mainly operate individually during the low water spring tides. Some of them collect predominantly crabs, while others collect sea cucumbers and oysters as well as bait organisms such as bloodworm. The sea cucumber and oyster collectors sell their harvest mainly at local markets.

(1) During the socio-economic study, the consultant was able to verify that in the fishing centre of N´semo/Quibundje, fishers primarily comprise those who were transferred onshore from the islands.
(2) The enumerators assigned encircling gill nets and surrounding pursing to the same category during the census.

Table 9.46 ***Number of Small-scale Fishers in the Palma District and Cabo Delgado Province***

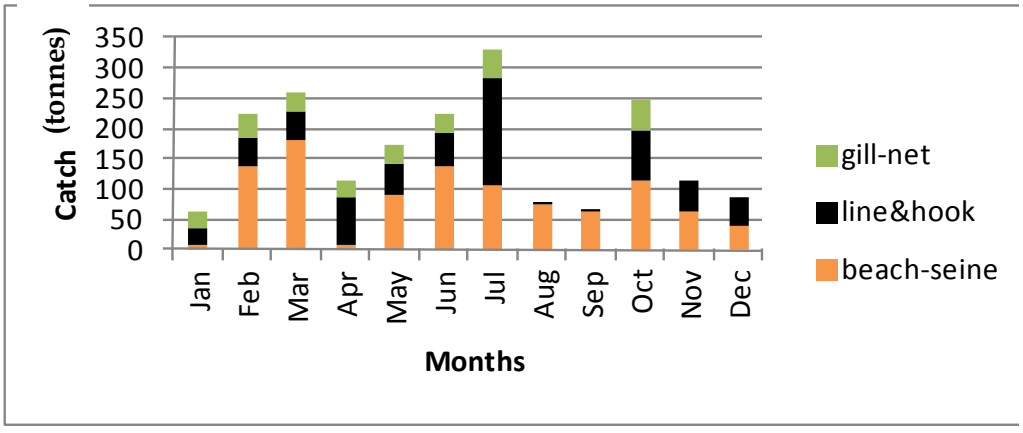
	Number of Fishers District of Palma			Number of Fishers Cabo Delgado
	Men	**Women**	**Men/Women**	**Men/Women**
Total	5,890	1,558	7,447	32,392
Fishers with boats	2,578	0	2,557	14,261
Permanent	2,363	0	2,362	12,700
Occasional	215	0	215	1,561
Fishers without boats	1,387	717	2,104	9,461
Handline	433	0	433	2,495
Harpoon	491	202	693	2,878
Quinias/double stick net (1)	236	463	699	2,957
Gamboas/barrier (2)	227	52	279	918
Divers	750	0	750	1,410
Collectors	1,175	841	2,016	7,260

Source: Mozambican Ministry of Fishing, 2008.

Notes:
(1) Small-size net pushed by two persons.
(2)Vertical barrier fixed in the intertidal zone.

Catch data from beach seine, drifting and set/anchored net and line fishing for 2009 are summarised in *Figure 9.31* and *Table 1.3* in *Annex G*. According to the National Fisheries Research Institute (IIP), the catches vary seasonally, but average landings per month were near 200t and the annual catch was estimated at 2,001t in that year. There was a sharp decrease in 2010 to 1,306t and recovery to 1,939t in 2011, a figure near the 2009 catches. In 2011, monthly catch rates from Palma District were dominated by the beach seine, which yields around 87kg/day/net, followed by drifting and set/anchored gill nets at 42kg and 50kg/net/day respectively. Line fishing was estimated at 13kg/net/day.

Figure 9.31 ***Monthly Catches (Tonnes) by the Three Main Fishing Methods Sampled in Palma District in 2009***



Source: Compiled by Lwandle Technologies from IIP catch statistics.

Afungi Project Site and Surrounds (Including Senga and Maganja)

Small-scale fishing is practised by the communities along the coast and along inland waterways, where catches are used for consumption as well as for sale. This constitutes the second-most important activity in terms of food security and income for the domestic economy in the Afungi Project Site and Surrounds, and is the occupation of 24.3 percent of heads of surveyed households (*Table 9.38)*.

According to the Strategic Plan for the Artisanal Fisheries Sub-sector (PESPA) 2007 (1), small-scale fishing may be subdivided into subsistence fishing and commercial artisanal fishing, and a distinction is made between fishers who only produce for home consumption and those who produce for consumption as well as for sale.

In general, the majority of households in the Afungi Project Site and Surrounds are involved in subsistence fishing oriented towards home consumption, with commercial fishing being largely undeveloped. Only a small group of fishermen approach small-scale fishing with a more commercial strategy.

During the survey, three fishing areas were identified within the area where this natural resource is available. These are:

- intertidal zones, which are widely used by gatherers to collect invertebrates (bivalves, crustaceans and gastropods) (see *Figure 9.35*);
- fishing areas located between the coast, the islands and areas around the islands, generally in areas up to 50m depth; and
- fishing areas located in deeper waters east of the islands; these waters are referred to by the fishermen as the 'high sea'.

Those intertidal and fishing areas up to 50m depth are frequented by fishermen residing in the Afungi Project Site, including the Palma Fishing Centre and the fishing centres in the Olumbe Administrative Post, although the offshore zone is only used by fishermen with motorised boats(2).

Main Types of Fishing Settlements

There are two settlements with fishing centres in the Afungi Project Site and Surrounds (*Figure 9.33*), namely Milamba 1 and N´Semo/Kibundjo and two fishing centres in Milamba 2 and Ngodje. The Funzi Fishing Centre is located just a few hundred meters outside the Afungi Project Site. There are approximately six fishing settlements to the south of Afungi Peninsula, along

(1) See *Annex G* for further information.
(2) At Palma Fishing Centre, only a very limited number of fishermen have motorised boats.

the coastline from Maganja to Olumbe, most of which are included in the Locality of Mute.

Milamba 1 and N´semo/Kibumdju are settlements with fishing centres (1) that are inhabited by a mixture of fishermen who reside there with their families, seasonal and permanent fishermen without their families, seasonal and permanent fish traders, and residents involved in other activities such as agriculture, coconut palm cultivation and commerce.

Other fishing centres (which are not necessarily population settlements) have permanent residents (fishermen, fish sellers, salaried fishing workers, etc) and some seasonal migrants from the interior of Palma District, and even from other provinces (2). These people live there during periods of the year when fishing is favourable, and are commonly known as '*vientes*' (loosely translated as 'outsiders'). These people include fishermen, waged fishing workers and fish sellers who remain in such fishing centres between August and October, before the beginning of the agricultural planting season. There are a number of fishermen, fish sellers and salaried workers who arrived as migrants and established residence in the fishing centres, marrying local women, thus establishing permanent residency in the fishing centre for periods of more than two or three years.

Other fishermen normally come and go daily or remain in the fishing centres for several days, and these are generally individuals who reside in settlements and villages located closest to the coast, such as Palma, Quitupo and various scattered settlements (production zones) located in the Afungi Project Site. For example, the Ngodje Fishing Centre only has four resident families, and the remaining fishermen and sellers stay for between one week and one month for the specific purpose of fishing, drying fish, selling their production or buying products. These people normally return to their own areas after these activities are completed.

The N´semo/Kibundjo Fishing Centre is the centre with the highest number of residents in the area, and hosts a large number of *vientes* from various points in the District and even from other provinces, mostly from the Nacala District in Nampula Province. The majority of the residents are individuals who previously lived on the islands of Tecomaji, Queramimbi and Rongui, and who subsequently were relocated due to the construction of resorts on those islands.

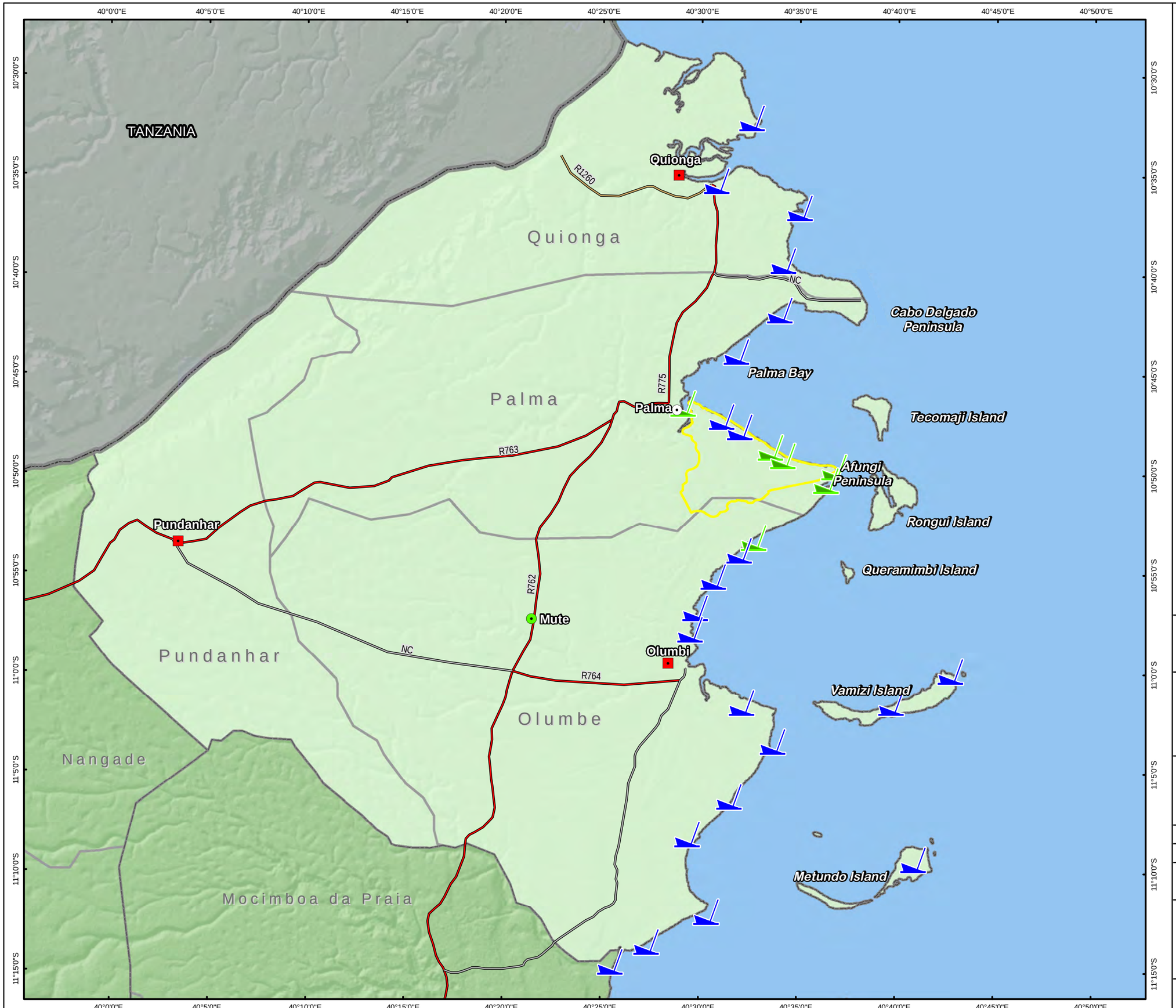
Table 9.47 shows the distribution of fishermen in the fishing centres located within the Afungi Project Site boundaries, with an approximate total of 757 permanent and temporary fishermen, corresponding to approximately 10 percent of the total number of fishermen in Palma District. The seasonal fishermen represent approximately one third of the total.

(1) Due to this distinction, the consultant differentiated between settlements with centres and fishing centres respectively, as outlined in *Section XX*.
(2) In the fishing centres visited, it was noted that there are many migrants from the Nacala District, Nampula Province.

Table 9.47 Number of Fishermen in the Fishing Centres of the Afungi Project Site

Fishing Centre	Permanent	Seasonal	Total
Ngodje	45	20	65
Milamba 1 and 2	192	80	272
N´semo/Kibundjo	270	150	420
Total	507	250	757

Source: Impacto, 2012.



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- District Centre
- Locality Centre
- Administrative Post Centre
- Fishing Centre
- Settlement with Fishing Centre

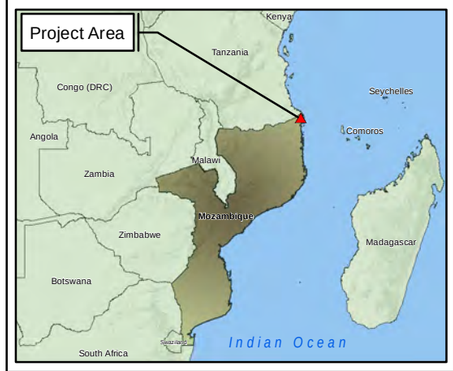
Roads

- Tertiary
- Local
- Non Classified

- Afungi Project Site
- District Boundary
- Administrative Post Boundary
- Palma District

Province

- Cabo Delgado



MAIN MAP SCALE:

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Kilometers

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Figure 9.32: Fishing Centres in Palma District

CLIENT:

Anadarko Moçambique Área 1, Lda

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DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 330 000

DRAWING: Fishing Centres in the District.mxd

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ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

SIZE: A3

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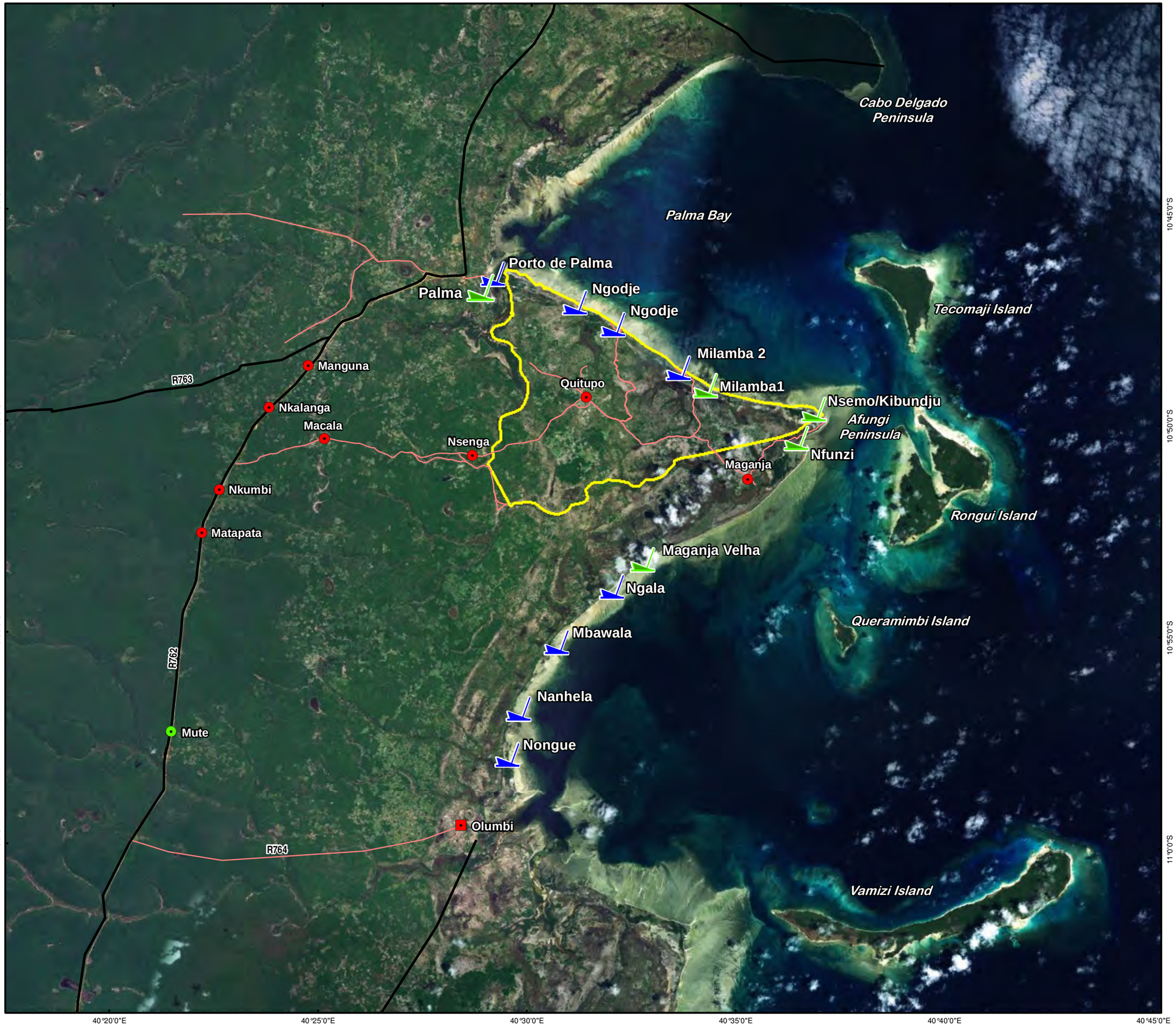

Legend

- Villages
- Locality Centre
- Administrative Post Centre
- Settlement with Fishing Centre
- Fishing Centre
- Local Roads
- Regional Roads
- Afungi Project Site

MAIN MAP SCALE:

0 2 4 6 8

Kilometers

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TITLE:

Figure 9.33: Fishing Centres in the Afungi Project Site and Surrounds

CLIENT: Anadarko Moçambique Área 1, Lda

DATE: Aug 2012	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 160 000

DRAWING: Fishing Centres in the Afungi Project Site and Surrounds.mxd

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Impacto Projectos e Estudos Ambientais

ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: Bing Maps ©2010 Microsoft Corporation.
Impacto, 2012. Inset Map: Esri Data & Maps

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Types of Fishermen and Fishing Techniques

During the Social Assessment, 29 interviews were conducted with fishermen and fish sellers in the fishing centres in the Afungi Project Site and southern surrounds. Some households interviewed in the Household Survey reported fishing as their primary or secondary activity.

The interviews identified the following types of fishermen in the area: fishermen with boats, fishing boat workers, divers and gatherers. The types of boats most commonly used by the fishermen are canoes, flat-bottom boats and skiffs.

- Canoes are generally made from carved tree trunks and can carry between one and four people; however, it is quite common that canoes are designed to carry not more than two people. These are the common type of boats that are used for fishing between the coast of the Afungi Project Site and the islands. They are generally used by fishermen using handlines, or by divers.

- The most common types of boats are dhows or '*chuabos*'. Generally these are sailing vessels, but some *chuabos* may have outboard motors. Depending on the size and type of construction methods used, these boats have capacity for between four and 50 people.

- Fibreglass skiffs with outboard motors are few in number, and are only seen around the Palma Fishing Centre within the area.

The canoes used by fishermen are built locally by the fishermen themselves, in some cases with the help of the IDPPE programme, which provides training to fishermen and boat builders.

Most of the fishermen interviewed reported that the canoes, launches and skiffs are their own property. Some larger boats and skiffs were purchased through financing provided by lines of credit offered to fishermen under a programme financed by the Small Industry Development Fund and by the IDPPE, managed by GAPI and AMODER. In many cases, these larger boats are leased and/or shared.

Based on the interviews, the fishermen in the fishing areas use different fishing methods, as shown on *Table 9.48*.

Table 9.48 Types of Fishing Gears in the Afungi Project Site and Surrounds

Fishing Gear/Method	Species Caught	Characteristics
Gill nets (drifting)	Grouper, turtle, shark, parrotfish, crevalle jack (*Xareu*)	This type of fishing is done with a sailboat or motorboat, with the net being launched in two sections by six to 10 fishermen. The net remains in the sea overnight or for one or two weeks. In the first case, the fishermen gather the net and the fish a few hours afterwards or the next day. In the second case, the fishermen check and remove the fish over a period of a few days. First-grade fish is selected.
Pursing net	Rockfish, mackerel, sardine, redfish	This type of fishing requires a motorboat and a 1½ inch net. It is conducted during the night with the assistance of lanterns/flashlights (as light sources), catching schools of fish.
Seine net	Rockfish, peixe cozinheiro, ladrão, grouper, buju, nacassumbe, piri-piri, mambuaissui, gombezi, sala	This type of fishing occurs in areas near the shore or other shallow areas, where the net can be dragged to the beach or through shallow water. A midsize boat is used for this type of fishing, with between 10 and 14 fishermen who pull the net from the sea to the shore (or through the water).
Handline	Grouper, marlin, famache, tuna, sailfish, rockfish, sole, squid, rays	Handline fishing is undertaken in shallow waters with transportation via canoe. Fish are caught with a fishing line and hook.
Collectors	Bivalves, gastropods and crustaceans such as oysters, cutanda, small fish, macaza	This work is conducted primarily by women, in the tidal areas. Some catch/harvest seafood in up to knee-deep water, while others travel to the islands in canoes to dive for shellfish.
Divers	Grouper, rockfish, octopus, squid	Divers descend to a depth of up to 15m, without diving equipment. Fishermen swim or travel in canoes to the dive site.

Source: Impacto, 2012, from interviews with fishermen at the fishing centres, January 2012.

On average, seine netting takes place in waters between 5 and 7m deep, while the maximum depth for pursing nets is around 100m (depending on the size of the net). Handline fishers fish in waters with a maximum depth of 200m. Divers typically dive to 15m and seldom exceed 30m (only a few very skilled divers are capable of diving to 30m depths).

The findings from the interviews show that there are a number of types and combinations of fishing methods practised, based on factors such as ownership/use of a boat, type of fishing method, fish sale method (fresh, dry, smoked) and the position of the fisherman in the work process (self-employed or owner/salaried worker). In summary, the following types of fishermen were identified in the Afungi Project Site and Surrounds (Palma and southern surrounds):

- commercial artisanal fishermen, who fish using a large gill net. Small percentages of these fishermen are organised into associations, and most

reside in Palma town. They have skiffs with outboard motors (or sails, in some cases) and they fish using a cast net. They hire fishermen and pay them in cash or in kind, and sell fresh fish. They also dry the fish and sell it to marketers;

- subsistence artisanal fishermen using line fishing, who own their own canoes with capacity for between one and four individuals. They go out to fish alone or with other fishermen. In general, they do not hire workers. They share a boat and the produce, although the owner of the boat keeps an equal or higher percentage of the catch. A portion of the fish is sold fresh. They do not dry the fish, but sell it to small marketers in the fishing centres, who then dry and sell the fish;

- subsistence artisanal fishermen, who fish using a line and who are not the owners of the boat they use generally under a system of division of catches. Each fisherman sells part of the catch fresh, with the rest sold to local merchants who dry and sell the fish;

- Fishermen using pursing nets/*kavogo*, seine nets or gill nets, who are owners of boats with sails and a capacity for between four and 50 fishermen. The most common boats used are those with a capacity for 20 individuals. The specific characteristics of this category are:

    - subsistence artisanal fishermen who are owners of small vessels (with capacity of between two and four people). They share the boat and the catch with their fellow fishermen crew. Some of the catch is sold fresh and some sold to local marketers, who then dry and sell the fish, and

    - artisanal fishermen who are more market-oriented, and are owners of larger boats with a capacity of between six and 50 people. In general, they use salaried workers, who are paid in cash and/or in kind. The owner sells both fresh and dry fish, and sells fish to marketers in the fishing centres or external marketers with whom he already has a supply agreement;

- subsistence artisanal fishermen, who fish using pursing nets/*kavogo*, seine nets or gill nets, who are not boat owners. They share the boat and the catch with the owner. Most of the catch is sold to marketers, who dry and sell the fish; and

- salaried fishermen, who work on boats owned by fishermen with skiffs with outboard motors or sailboats with capacity for six to 50 individuals and who fish with gill nets, pursing nets or seine nets. They are paid in cash or in kind. Fishermen who catch and dry fish generally receive a portion of the fresh catch after the fishing trip, and another part after the sale of the dry fish.

Figure 9.34 and *Figure 9.35* illustrate the various fishing activities and methods.

Figure 9.34 Fishing Vessels and Activities

Boat building in N´semo

Fish drying in Milamba 2

Fisherman with a gill net at Ngodje Fishing Centre

Line fishing in front of the Ngodje Fishing Centre

Pursing nets in the Ngodje Fishing Centre

Salaried fishermen at the N´semo Fishing Centre

Source: Impacto, 2012.

Figure 9.35 Fishing Activities in the Afungi Project Site and Surrounds

Bivalves and gastropods collected by collectors

Bivalves and gastropods processed as construction material

Source: Impacto, 2012.

Fishing Areas

During the socio-economic baseline fieldwork, a number of fishing areas located primarily in the Afungi Project Site and Surrounds were visited, during which 18 main areas were identified, as shown in *Figure 9.36*. These areas are generally used by fishermen from all fishing centres in the Afungi Project Site and Surrounds without distinction in terms of areas, since each fishing area has an abundance of certain species, which could be related to the existence of rock or coral formations, seaweed beds, depth (offshore/shallow coastal areas) and other factors. Thus, the areas are selected based on the type of species the fishermen catch.

During interviews and conversations with fishermen, some areas were reported to be good for fishing, especially those locations around the islands where it is possible to find a number of different species. However, in the past for a period of time, the population was prohibited from fishing in many of these areas. Even though no boundaries were established, fishing has been forbidden around Tecomaji Island and the Quimesse Fishing Area in Rongui Island, which have been granted for use by tourism operators.

Furthermore, as previously mentioned, fishermen who resided on Tecomaji Island were relocated from that area to the N´semo Fishing Centre. This has impacted the dynamics of their activities, since their previous location was in a strategic area in terms of access to fishing resources.

40°20'0"E 40°25'0"E 40°30'0"E 40°35'0"E 40°40'0"E 40°45'0"E

10°45'0"S

10°50'0"S

10°55'0"S

11°0'0"S

Cabo Delgado Peninsula

Palma Bay

Mitende
Ngodge mar
Tchotchobue
Mitalala
Boia
Parassi
Npuri
Mitupa
Quitunga
Alue
Nzungumuno
Quilola
Palma
Tecomaji Island
Nalungo
Quimesse
Quitupo
Afungi Peninsula
Manguna
R763
Nkalanga
Macala
Nsenga
Maganja
Mitundo
Nkumbi
Rongui Island
Matapata
Kossovo
Queramimbi Island
Quifichoni
Lebanon
R762
Mute
Mussululo
Nguzi
Olumbi
R764
Vamizi Island

Legend

- Villages
- Locality Centre
- Administrative Post Centre
- Settlement with Fishing Centre
- Fishing Areas
- Fishing Centre
- Local Roads
- Regional Roads
- Afungi Project Site

MAIN MAP SCALE:

0 2 4 6 8

Kilometers

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TITLE:

Figure 9.36:
Fishing Areas Used by Fishermen of the Afungi Project Site and Surrounds

CLIENT:

Anadarko
Moçambique Área 1, Lda

DATE: Aug 2012	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 160 000

DRAWING: Fishing Areas Used by Fishermen.mxd

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Projection: UTM Zone 37 S Datum: WGS84
Source: Bing Maps ©2010 Microsoft Corporation.
Impacto, 2012. Inset Map: Esri Data & Maps

SIZE: A3

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Marketing Routes for Fishing Produce

The selling of fish produced in the fishing centres of the Afungi Project Site and Surrounds is primarily conducted via sea transportation in canoes or boats owned or leased by the fishermen to the port of Palma town, where there is a large centre for this purpose. The fishing centres located south of the village of Maganja market the fish using the Olumbe/Mocímboa da Praia route or the Palma route.

From Palma, Olumbe or Mocímboa da Praia, the fish is transported overland to various destinations in the interior of the District and province (such as Pundanhar, Mocímboa da Praia, Mueda and Nangade, among others), to other provinces (such as Nampula and Niassa) or even to other countries (such as Tanzania). There are Tanzanian traders travelling by boat to Palma or directly to the fishing centres to buy fresh and dried fish, as well as gastropods and molluscs processed by collectors, using contacts and networks already established between the Tanzanian traders and traders or fishermen established in Palma town or in the fishing centres.

In the fishing centres of the Afungi Project Site and Surrounds, fishing products are not always transported by sea. Sometimes, the merchandise is transported on foot to the Palma fishing centres and, in such instances, the owners of the merchandise hire carriers, who may even transport the products on their heads, and are paid approximately 50 MZN for each 50kg sack.

Table 9.49 summarises the cost of transporting merchandise and passengers by sea between the fishing centres in the Afungi Project Site and Surrounds, in Palma, and ground transportation between Palma and the main destinations reported.

Table 9.49 Cost of Maritime/Ground Transportation of Goods and People

	100kg Sack/Boat (MZN)	**Passenger/Boat (MZN)**	**50kg Sack/Car (MZN)**	**Passenger/Car (MZN)**
Ngodje–Palma	50	50	Non-existent	Non-existent
Milamba–Palma	100	100	Non-existent	Non-existent
N´Semo–Palma	200	175	Non-existent	50
N´Semo–MDP*	175	150	Non-existent	Non-existent
Palma–MDP*	-	-	65	100
MDP*–Nacala	-	-	350	600
N´semo–Nacala	-	200	Non-existent	Non-existent
Palma–Nangade	-	-	150	250
Nangade–Mueda	-	-	75	100
Palma–Tanzania	500	250	500	500

Key:
* MDP: Mocímboa da Praia.

Source: Impacto, 2012, from interviews with fishermen at the fishing centres, January 2012.

Contribution of Fishing to the Local Economy

Although largely viewed as an isolated economy, small-scale fishing interacts with a number of other activities from different sectors, as well as within its own chain of value, as outlined below.

- A large percentage of households undertake fishing in conjunction with other activities such as subsistence farming, coconut palm and cashew cultivation (part is used for sale), or production of handicrafts (for sale).

- Owners of boats lease their vessels for fishing or the transporting of goods.

- Support activities, such as supplies, boat building and repair- of these, the boat-building industry is the most important in the fishing centres of Afungi Project Site and Surrounds, in other villages and Palma town. According to the IDPPE (2004), there were 82 boat builders in Palma, based in fishing villages that are equipped with the infrastructure for boat building. There are no community-based suppliers of fishing equipment in the towns and villages sourrounding the Afungi Project Site (including Palma) or within the site itself, although it may be sold in local informal markets. The main sources of equipment are located in Pemba, Nacala, Nampula and Maputo, and even as far as Tanzania and Malawi (1).

- Other activities such as fish drying and marketing- in 2008, there were 212 processers in Palma District (out of 1,102 in Cabo Delgado Province) and 203 traders (out of 1,905 in Cabo Delgado Province). Sun or salt-dried and smoked fish increases the shelf life of fish products, eg salt-dried fish can last up to five months, making it more marketable and thus sold in different parts of the District, neighbouring districts and provinces.

- Wage labour was also observed in the area. Some fishermen work on vessels owned or operated by other individuals in exchange for a salary. For example, subsistence fishermen may be recruited by commercial artisanal fishermen as part-time labourers.

Changes in this interdependent system, caused by factors such as droughts, floods, pests, interruption in land and sea transportation of people and goods, and loss of access to the coast and fishing areas, could negatively impact livelihoods in the area and activities conducted by households. These include subsistence and commercial small-scale fishing and agriculture, or the informal marketing of products transported via land or sea, to mention only a few of the most important examples.

(1) No specific places were mentioned in these two countries as being used to purchase fish equipment.

9.14.4 Tourism

Palma District

Most of the existing tourism establishments in the District are based on marine, coastal and game resources. The Palma District has had limited investment in tourism infrastructure to date, with the exception being the established resorts on the islands eg Vamizi Island, and those currently under construction.

In line with the Strategic Plan for Tourism Development in Mozambique (2004–2013) and the Provincial proposal for Tourism Development (Provincial Tourism Directorate, 2008), the sector considered to have the most development potential is leisure tourism, based on sea activities and game farms. The Strategic Plan defined almost the entire Palma District as an area for multiple activities such as hunting and photographic safaris. Three coastal areas were defined for tourism based on beach and sea activities (Quirinde–Mbwizi, Quiwia and Lalane) (1). The sea-based operators along the coast and the islands depend on the pristine sea, corals, beaches and the vast variety of fish for their activities. Activities offered by these operators include scuba diving and snorkelling, sport fishing and recreational boat trips.

Table 9.50 shows some of the hotel establishments in Palma District, their ratings, location, capacity and respective volume of investments.

Table 9.50 Hotel Establishments in Palma District

Designation	Location	No. of Rooms	No. of Beds	Type	Category/ Ratings	Investment Value	No. of Workers	Notes
Hotel Palma	Palma Capital	6	13	Boarding house	Sole	150,000 MZN	3	
Casa Malope	Palma Sede	4	4	Guest-house	Sole	Not available	6	
Pensao Maganja	Palma Sede	10	11	Boarding house	One star	Not available	5	
Pensao Wivo	Palma Sede	7	7	Boarding house	One star	80,000 MZN	6	
Vamizi Island Lodge	Ilha Vamizi	12	32	Lodge	Five star	134,400,000 MZN	58	
Verde Mar	Ilha Metunge	10	20	Lodge	Five star	19,200,000 MZN	39	
Tecomaji	Ilha Tecomaji			Lodge		10,000,000 USD		Con
Quera-mimbi	Ilha Queramin mb			Lodge		Not available		Con
Tambuzi	Ilha Tambuzi			Lodge		150,000 USD		Con
Vumba	Ilha Vumba			Lodge		300,000 USD		Con

(1) See *Figure 9.18* showing existing and requested DUATs in Palma District for coastal tourism, game reserves and game farms.

Designation	Location	No. of Rooms	No. of Beds	Type	Category/ Ratings	Investment Value	No. of Workers	Notes

Key:
Con: in construction phase.

Source: Impacto, 2012.

9.14.5 Trade

Palma District

The trade network in Palma District consists mostly of small-scale informal traders, categorised by the industry and commerce sector as 'rural commercial activity'. The network comprises 157 commercial establishments (eg shops, stands and bars) (District Annual Balance of Economic and Social Plan, 2011). In addition, the District government has recently licensed 20 additional commercial and industrial establishments.

In Palma town, although informal, trade seems to be dynamic, with some established Tanzanian traders running their shops with goods brought from across the border, and other traders with supplies from Pemba and Nampula. Across the District, this rural commercial activity is limited and concentrated in the Administrative Posts and Locality centres and generally yet to be developed.

Afungi Project Site and Surrounds (Including Senga and Maganja)

The Afungi Project Site and Surrounds is characterised by a weak commercial network, both formal and informal. In Maganja Village and N´semo settlement, there is a market area with some informal commercial establishments (*Figure 9.37*), while in the villages of Senga and Quitupo there are only a few isolated establishments.

The existence of a more dynamic market in Maganja and N´semo is due to the fact that these settlements are located in a coastal zone, which is a stopping point for sea routes used to transport merchandise and passengers to this area from the northern and southern coasts of Cabo Delgado Province.

The primary factors contributing to these areas being stopping points on merchandise transportation routes are:

- the geographic location of Maganja and N´semo to the extreme east of the Afungi Peninsula;
- the large number of permanent and seasonal individuals and fishermen who reside in the village of Maganja and in the settlements with fishing centres of Nfunzi and N´semo; and

- the difficulty of travelling by land, due to lack of transportation and the poor condition of the road between Maganja and Palma. The population in the interior must travel on foot to Palma to buy supplies.

Figure 9.37 Local Shops in Maganja and N´semo

Source: Impacto, 2012.

Approximately 70.7 percent of surveyed households mentioned that there are informal stands in their areas. However, only small and urgent purchases are made at these stands. The vast majority of the population (more than 90 percent) travel to Palma to purchase products for consumption and resale. Thus, the population of the Afungi Project Site and Surrounds is heavily dependent on Palma.

The majority of the surveyed households travel an average of 124 minutes on foot, or in boats, to buy food and other products (1). *Table 9.51* provides information by zone and by time travelled by households to reach a location where there is a mill, a shop, an informal stand or a store buying farm products.

Table 9.51 Travel Time (in Minutes) to the Nearest Markets

Zone/Village…	Coastal Zone	Maganja	Quitupo	Quitupo Settlements (Production Zones)	Senga
To a mill	151	193	95	270	99
To a shop	159	168	92	100	106
To an informal stand	65	12	9.0	42	25
To a store buying farm products	156	183	97	33	86

Source: Impacto, 2012.

(1) The Social Assessment did not address the frequency of travelling. However, field observations are that most of the households do not do it more than twice a month.

Only in the case of the villages of Quitupo, Maganja and Senga are there nearby informal stands, since the households in those areas reported that they spend between 9 and 25 minutes travelling to those establishments. Residents of other areas are required to travel for much longer.

All other types of commercial establishments are much further, and households reported spending between 1.5 and 4.5 hours travelling to those establishments:

- Almost all of the households are dependent on Palma, and travel long distances to process farm products at a mill.

- The same scenario (dependency) occurs with stores that sell basic products and buy agricultural products, as nearly all households report that they travel to Palma and spend between 1.5 and 3 hours travelling.

9.14.6 Income-generating Activities in Afungi Project Site and Surrounds (Including Senga and Maganja)

Income-generating Activities

The sale and processing of often-surplus farm produce, fruit, fish and, when necessary, livestock, are the basis upon which income for communities in the Afungi Project Site and Surrounds is derived.

Table 9.52 below presents the range of activities performed by the surveyed households and the average income obtained in each, by households involved over a 12 month period prior to the survey. With the exception of informal commerce and the sale of fresh fish, income reported in the same 12 month period from other activities is still very low.

Table 9.52 Income-generating Activities Reported by Surveyed Households

Income-generating Activities Performed	Households Involved (%)	Average Income Last 12 Months (MZN)
Sidewalk or street sales/informal commerce	9.3	16,545
Sale of fresh fish	29.3	11,523
Sale of food products	4.3	6,033
Specialised work (carpenters, stonemasons, painters)	2.9	5,300
Sale of farm products	40.7	3,402
Production and sale of traditional drinks	10.0	3,303
Sale of coconuts	25.0	3,220
Sale of cashews	12.1	2,820
Sale of dry/smoked fish	12.1	2,702
Sale of animals	12.9	2,166
Sale of medicinal plants	2.1	1,283
Sale of wood/fenceposts/thatch	6.4	1,180
Temporary work for others (neighbouring farms)	2.9	887
Sale of handicrafts (woven products, hats)	12.9	695

Income-generating Activities Performed	Households Involved (%)	Average Income Last 12 Months (MZN)
Income from permanent work (government, private)	4.3	-

Source: Impacto, 2012.

The sale of farm products, coconut and fresh fish are income-generating activities practised by a large number of households (41, 29 and 25 percent respectively). Other than these activities, the most important sources of income are the sale of animals and handicrafts (13 percent each), the sale of cashews (12 percent) and the sale of dried or smoked fish (12 percent).

Commerce in the area is undertaken through informal stands or street selling. Despite several households selling their own produce, only 9.3 percent of the households are involved in commercial activities that comprise buying and selling products.

A significant percentage of the surveyed households in the Afungi Project Site and Surrounds sell farm products (40.7 percent). However, the average income over the previous 12-month period was approximately 3,402 MZN, highlighting the weak development of the local market (see *Table 9.52*).

Fish is sold fresh, dried or smoked. The sale of fresh fish is a significant activity in which 29.3 percent of the surveyed households participated, providing an average income of approximately 11,523 MZN over the previous 12-month period. Some 12.1 percent of the households engaged in the sale of dry/smoked fish, resulting in an average income of 2,702 MZN during the same period.

Although only 9.3 percent of the surveyed households are involved in informal commerce, it is a significant source of income, and provided an average annual income of 16,545 MZN. The items are sold at small stands constructed with traditional materials (bamboo and mud huts covered with thatch). The products sold are basic commodities such as sugar, salt, oil, soap and rice, which have been obtained through trade or purchased from Mocímboa da Praia and carried back to the community for sale locally.

Nearly 13 and 12 percent of households participated in the sale of livestock and cashew nuts respectively, resulting in an average income of 2,166 MZN and 2,820 MZN respectively. Specialised work is only undertaken by 2.9 percent of the households, resulting in an average income of approximately 5,300 MZN. When production is low, some people secure temporary work on farms, in carpentry shops or sawmills owned by others, in exchange for money or agricultural products. Approximately 2.9 percent of households engaged in this type of temporary work, which contributed to an average income of 887 MZN.

Although 12.9 percent of households produce and sell handicraft products, this activity does not contribute greatly to household income. During FGDs, women stated that the sale of handicrafts (such as weaving) is not profitable, since there are no buyers for their products – and when woven items are completed, they wait a long time until buyers appear from Palma or other locations.

FGDs confirmed the existence of a women's association in Senga (the only such association in the area), which contributes to a savings fund. This fund has increased the savings of the participating women, so that they can later invest in their businesses.

Annual Income of Households

Households residing in the Afungi Project Site and Surrounds conduct a number of different income-producing activities as part of their survival strategies. In order to provide a more comprehensive analysis of the pooled income, the households were classified into four income groups, as shown in *Table 9.53*.

Table 9.53 Household Income Groups and Average Annual Income Reported by Surveyed Households

Income Group (in MZN)	%	Average Income per Group During the Past 12 Months (MZN)
150–1,549	25.0	956
1,600–4,300	25.0	3,112
4,400–9,000	21.8	6,373
+10,000	28.2	30,207
The whole sample	100.0	10,931
Don't know/Did not answer	11.4	-

Source: Impacto, 2012.

The average annual income reported by the surveyed households is 10,931 MZN, corresponding to a theoretical monthly income of approximately 911 MZN. A more comprehensive analysis of income shows that:

- half the sample reported an income that did not exceed 3,112 MZN in one year;
- 25 percent of the surveyed households have an average annual income of approximately 956 MZN, and a further 25 percent reported an average annual income of approximately 3,112 MZN;
- 21.8 percent reported an average income of approximately 6,372 MZN; and

- 28.2 percent of those surveyed had an average income of approximately 30,206 MZN (1,140 USD) in the previous 12-month period.

Table 9.54 shows the area of residence by income group for the Afungi Project Site and Surrounds.

Table 9.54 Area of Residence by Income Group in the Afungi Project Site and Surrounds

Income Group (in MZN)	Number of Surveyed Households by Area of Residence				
	Quitupo (N=48)	Quitupo Settlements (Production Zones) (N=12)	Coastal Zone (N=20)	Senga (N=18)	Maganja (N=26)
150–1,549	7	6	7	6	5
1,600–4,300	13	2	3	6	7
4,400–9,000	12	2	4	3	6
+10,000	16	2	6	3	

Key:
N: Total sample size.

Source: Impacto, 2012.

The following conclusions are drawn from *Table 9.55* above**.**

- In the Quitupo Settlements (production zones) and Senga, more households belong to the lowest income groups (below annual income of 4,300 MZN). This is due to the majority of households being engaged in subsistence farming as their primary activity.

- In Quitupo and Maganja, more than half the households belong to the two highest income groups. Their annual incomes range between 4,400 and above 10,000 MZN. This could be due to these households participating in activities such as fishing and informal commerce in addition to crop farming.

- In the Coastal Zone, half the households have incomes below 4,300 MZN. More than a third of the households (seven households) have very low income (between 150 and 1,549 MZN), while nearly one third (six households) have an income in excess of 10,000 MZN.

Table 9.55 shows the income groups based on the main occupation of the heads of the households.

Table 9.55 Income Groups Based on the Occupation of Surveyed Households

Main Occupation of the Heads of the Households	% of the Income Groups (MZN)			
	150–1,549	1,600–4,300	4,400–9,000	+10,000
Working for others	-	-	7.4	2.9
Self-employed/small industry	3.2	-	11.1	2.9
Self-employed/food preparation	-	-	7.4	2.9
Self-employed/construction materials	12.9	3.2	-	-
Self-employed/commerce	6.5	6.5	3.7	20.0
Farmer	58.1	64.5	55.6	25.7
Fisherman with boat/net	9.7	22.6	14.8	40.0
Fisherman without boat/net	3.2	3.2	-	5.7
Other	6.5	-	-	-
Total	100.0	100.0	100.0	100.0

The following conclusions may be drawn from *Table 9.55*.

In the two lowest income groups (150–1,549 MZN and 1,600–4,300 MZN), further analysis has determined that:

- a large percentage of the heads of households are farmers (58.1 and 64.5 percent of the two income groups respectively), indicating that these households practise subsistence farming largely for the purpose of food security; and

- in the case of households dedicated to fishing (representing 13 and 26 percent of the two income groups respectively), artisanal fishermen perform essentially subsistence-level fishing, also for the purpose of ensuring food security.

In the two highest income groups (4,400–9,000 MZN and +10,000 MZN), further analysis has determined that:

- approximately 56 and 26 percent of heads of households in each of the higher income groups respectively are farmers. These are households that, in addition to subsistence farming, are able to market extra agricultural production and/or own cashew trees and/or coconut trees and sell cashews or coconuts;

- approximately 15 and 46 percent of the households of each of the higher income groups respectively are market-oriented artisanal fishers, selling part of their production on the local market or to buyers at the fishing centres, thus obtaining relatively higher income; and

- nearly 19 percent of the heads of households from the higher income group of 4,400–9,000 MZN participate in informal small industry activities or food preparation, while 20 percent of those in the highest income group (+10,000 MZN) participate in informal commerce.

9.14.7 Aquaculture

No aquaculture projects have been identified within Palma Bay during fieldwork. However, areas in Palma Bay have been considered as having the potential for aquaculture and seaweed production based on criteria such as water depth, waves, currents, turbidity, etc. Approximately 7,079ha have been identified as having the potential for aquaculture in cages and 3,375ha with potential for seaweed production (INAQUA, 2011). These areas have since been declared as Marine Reserves by Decree no. 71/2011 of 30 December (1). In terms of aquaculture in cages, Pemba Bay has the most potential, where 10,673,50ha have been declared as Marine Reserves for that purpose. With regards to seaweed, Palma was considered as having the most potential, followed by Macomia and Mecúfi Districts (INAQUA, 2011). Management of these marine reserves is the responsibility of the Ministry of Fisheries.

9.14.8 Salt pans

There are scattered salt pans (*Salinas*) distributed in the coastal areas of the Palma District. Crude salt is harvested from these pans primarily during summer when the temperatures are high. They are located relatively close to the shore line (less than 2km). On the Afungi Project Site, 1.5ha of land have been identified as being used for salt production in artisanal salt pans located close to Milamba II and to N´semo (*Figure 9.19*). Salt from these artisanal salt pans is used mostly for consumption and to sell in local markets. During the socio-economic fieldwork, it was indicated that the Afungi salt pans had not been operational for some time and didn´t "employ" many people. This was confirmed by MICOA (pers comm, 2013) who indicated that the local authorities did not consider the Afungi salt pans as being economically important in terms of the number of people involved in the activity.

9.15 AFUNGI PROJECT SITE AND SURROUNDS (INCLUDING SENGA AND MAGANJA) CULTURAL AND RELIGIOUS PROFILE

9.15.1 Cultural and Religious Ceremonies

The Afungi Project Site and Surrounds has a diverse ethnolinguistic composition, comprising of the Mwani, Makonde, Makwé and Makhua ethnic groups.

According to data from Census 1997 and Census 2007, more than half of the population of Cabo Delgado Province is of the Islamic faith (54.5 percent in 1997 and 53.8 percent in 2007). This proportion is higher in the coastal districts of northern Mozambique and Cabo Delgado that have been historically influenced by Islam (2).

(1) Marine reserve is defined by the Decree as an area for the development of marine aquaculture.
(2) Data from religions is not disaggregated to the District level in the national Census database.

According to field observation and data from the national census at provincial level, it can be assumed that the majority of the population in the Afungi Project Site and Surrounds are of the Islamic faith. In Senga, there are also followers of the Christian religion (Catholic), represented by the Makonde group. Places of worship found within the settlements include churches and mosques, reflecting the two primary religions practised in the area.

Animism and ancestor worship are not practised, because the residents believe in divine sovereignty to the extent that prayer meetings for rain and successful agricultural campaigns are conducted in churches or mosques. Such ceremonies are generally led by the Sheikh, in the case of Islam, or other religious leaders.

In addition to ceremonies and prayers for rain and successful agricultural campaigns, other ceremonies conducted include the *Ziharat, Maulide* and initiation rites. The *Ziharat* is performed to remember loved ones/ancestors, while the *Maulide* is a celebration with prayers for peace and prosperity and thankfulness to God (Allah) for granted favours.

Initiation rites ceremonies mark the entry of children into adulthood, and occur frequently in the area (*Figure 9.38*). Normally, male children are taken to specific locations (usually near a river or lagoon), where they are taught for approximately one month about the main activities that await them in their adult lives. Traditional subjects addressed during these initiation rites including matters related to sexuality, survival systems and rules of social conduct, as well as the ancient traditions (manifested through specific dances).

For young girls, the initiation rites normally occur in their homes, where girls are instructed in activities that await them in their adult lives, including aspects related to sexuality. During this time, girls are also taken to specific places in the forest, where they remain for a period of time performing dances and participating in other traditional initiation rite customs.

In general, the initiation rites are conducted from December to January, which coincides with the school holiday period, preventing conflicts with school attendance.

Figure 9.38 Men's Initiation Rites, Quitupo Village

Source: Impacto, 2012.

Traditional and religious weddings are also conducted and locally referred to as *Chuo* and *Chitamo*. Normally, young girls marry between the ages of 12 and 15 years, after they have reached maturity that is marked by completion of the initiation rites. Boys normally marry between the ages of 15 to 18 when they feel capable or responsible enough to support a family, and after they have completed their initiation rites.

Selection of a wife is autonomous and is based solely on whether or not the young man is economically independent. However, young men and young women sometimes seek advice from their parents or maternal aunts or uncles during spouse selection, and this is also the case in the event of divorce.

During commemorative ceremonies, weddings and festive occasions in the community, different dances are performed, the most common of which include: *Nkala* (danced by men and women), *Tsihacubatula* (men, women and young people), *Mapico* (men), *Chinguengué* (men women and young people), *Ndalandala* (girls), *Wavé* (women) and *Zikirhi* (women).

Although ancestor worship is not practised in the communities, all focus groups mentioned that, before initiating a project, the proponent will inform the religious leaders, Sheikh and community leaders of their intentions so that ceremonies can be organised to bless the project.

9.15.2 Sacred and Historical Sites

The ancestor worship traditions (through *Ziharat* and *Maulide*) and ceremonial initiation rites take place at specific sacred sites.

Burial in cemeteries is a practice for both Islam and Christianity. Thus, cemeteries are found in areas near settlements. The information obtained from the Household Survey indicates that approximately 45 percent of the households have deceased buried in community cemeteries. The remainder reported burial in family cemeteries near their homes (37.9 percent) or far from their homes (15 percent). Community cemeteries are more frequent in villages where people are concentrated (Quitupo, Senga, Maganja), while family cemeteries are more common in scattered settlements such as the production zones and the Coastal Zone. The information collected during the FGDs confirms the survey data (*Table 9.56*) (1).

Table 9.56 Location of the Burial Sites in Afungi Project Site and Surrounds

	Total (%)	Coastal Zone (%)	Maganja (%)	Quitupo (%)	Quitupo Settlements (Production Zones) (%)	Senga (%)
Family cemetery close to the house	37.9	63.6	26.7	21.2	93.8	25.0
Family cemetery far from the house	15.0	22.7	16.7	19.2	6.2	-
Community cemetery	45.0	-	56.7	59.6	-	75.0
Other	2.1	13.6	-	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Impacto, 2012.

Churches, mosques and sites where initiation rites are performed are considered sacred sites.

9.16 AFUNGI PROJECT SITE AND SURROUNDS (INCLUDING SENGA AND MAGANJA): EXPECTATIONS REGARDING THE PROJECT

This section presents the perceptions of benefits and disadvantages of the Project, identified during the Household Survey (*Table 9.57*).

(1) This information will be a base to mapping all the family and community cemeteries during the Resettlement Action Plan.

Table 9.57 Perceived Advantages and Disadvantages of the Project by Surveyed Households

Advantages	Households (%)	Disadvantages	Households (%)
Social benefits (more schools, health centres, waterpumps)	65.0	Increase in AIDS cases	30.0
Access to employment	57.9	Prostitution	27.1
Road construction and maintenance	39.3	Entrance of outside individuals	26.4
People will open businesses in the zone	18.6	Criminality	25.7
Collective transportation on the highways coming into and leaving the zone	17.1	Loss of farmlands	22.9
Facilities for transporting products to sell in other areas	13.6	Prohibitions on fishing	17.9
Sale of farm products to the Project	7.1	Loss of producing trees (cashew, coconut, mango)	15.7
Arrival of buyers for farm products	5.0	Loss of houses and buildings	10.7
Other	11.4	Other	4.3

Source: Impacto, 2012.

In general, a higher proportion of the surveyed population identified the benefits rather than disadvantages or detrimental aspects of the Project.

The communities in the area hope that the Project will respect local habits and customs. They have requested that before beginning any activities, the developer should identify local leaders to engage and discuss the plans, and engage local communities in the Project. This will assist in preventing conflicts between the communities and the Project.

9.16.1 Perceived Advantages of the Project

The results of the Social Assessment show that local communities welcome the Project, since it is believed that it will drive development of the directly impacted communities in Palma District. Feedback from communities regarding the Project is indicated below.

- Approximately 65 percent of the surveyed households believe that the Project will provide social benefits such as an increase in infrastructure, for example (schools, waterpumps and hospitals).

  During FGDs in the villages of Senga and Quitupo, participants mentioned that they believe the Project will contribute to the construction of infrastructure such as mosques and maternity clinics or 'mothers' waiting houses' (1). According to participants, midwives endure great

(1) Houses near health units where mothers-to-be wait until delivery.

difficulties travelling to the homes of women in labour, due to the lack of transport.

- Fully 57.9 percent of the surveyed households believe that the Project will provide employment, thus contributing to an increase in household income.

- Some 39.3 percent of the households assume that construction of the Project will create conditions for the construction and maintenance of new roads, which will benefit surrounding communities.

- Other perceived advantages include the expansion of the electricity network (11.4 percent of households), expansion of the commercial network (18.6 percent), improvement of the transportation network as a result of construction of new roads (17.1 percent), and facilities for transporting products to be sold in other zones (13.6 percent).

9.16.2 Perceived Disadvantages

The identified disadvantages that could result from the development of the Project are summarised below.

- Approximately 30 percent of the surveyed households mentioned the potential increase in cases of HIV that could result from increased prostitution.

- Some 26.4 percent of surveyed households believe that the arrival of outside individuals (in-migrants) could increase, due to increased expectations for work and the establishment of camps for the Project.

- Some 25.7 percent of surveyed households believe that increases in levels of criminal behaviour could occur in the Afungi Project Site and Surrounds and in adjacent areas.

- The loss of farmland and producing trees (cashew, coconut and mango) was mentioned as a perceived disadvantage:

    - In Milamba, for example, it was mentioned that residents could lose their farming plots, houses and coconut tree plantations and be moved to another location.

    - The FGDs in Milamba and Maganja proposed that, in the case of damage to farmland or producing trees, the proponents should discuss or negotiate directly with the affected parties.

- The loss of houses and buildings was mentioned by only 10.7 percent of surveyed households as a disadvantage:

- During FGDs in Quitupo, the participants stated that they will suspend the construction of new houses, due to the rumours circulating that they may be resettled.

- Disruption to small-scale fishing was also mentioned as a potential disadvantage of the Project. Approximately 18 percent of surveyed households believe that they could be prohibited from fishing. This issue was also mentioned during the FGDs in Maganja.

9.16.3 Preferences if Resettlement were to Occur

When asked about possible resettlement, more than half of the surveyed families indicated that they would prefer to reside close to the location where they currently live (61.4 percent). Of the total households surveyed, 76.4 percent indicated a preference to reside in a concentrated village (or compound) and 71.4 percent preferred an area structured or organised as a village or settlement (*Table 9.58)*.

Table 9.58 Resettlement Preferences of the Surveyed Households in the Afungi Project Site and Surrounds

	Total Households in the Sample (%)	Coastal Zone (%)	Maganja (%)	Quitupo (%)	Quitupo Settlements (Production Zones) (%)	Senga (%)
Preferred Location as Compared to the Location Where They Currently Reside						
Nearby	61.4	45.5	76.7	69.2	31.3	60.0
Far away	27.9	54.5	13.3	19.2	50.0	25.0
No preference	10.7	-	10.0	11.5	18.7	15.0
Type of Village						
Concentrated village	76.4	72.7	80.0	80.8	62.5	75.0
Scattered village	9.3	9.1	6.7	7.7	31.3	-
As isolated household	5.0	-	-	11.5	6.3	-
No preference	9.3	18.2	13.3	-	-	25.0
Formally Organised Settlement						
Yes	71.4	81.8	70.0	61.5	81.3	80.0
No	5.0	-	6.7	5.8	12.5	-
No preference	23.6	18.2	23.3	32.7	6.3	20.0

Source: Impacto, 2012.

With regard to the preferred resettlement location, a significant difference is noted between those who live in villages and those who are dispersed throughout the Coastal Zone or in the Quitupo Settlements (production zones), with a higher proportion of those who live in villages preferring to live near the village where they currently live.

- Approximately 77, 69 and 60 percent respectively of the residents of Maganja, Quitupo and Senga would prefer to live close to where they currently reside.

- Approximately 50 and 55 percent respectively of those who reside in the Quitupo production zones and in the Coastal Zone prefer to reside away from the location where they currently reside.

Independent of the place of residence, if resettlement occurs, the results indicate that approximately two thirds or more of the households in all communities have expressed that they would prefer to live in a concentrated and formally organised village.

This desire was confirmed during the FGDs, where participants mentioned the following:

- In concentrated and organised settlements, they would have access to better social conditions that they currently do not have, such as social infrastructure (water, electricity, schools, hospitals and mosques).

- If they are resettled, they expect that the activities they currently practise and the characteristics of the soil in the new locations will be taken into consideration.

  For example, the participants in Quitupo and Senga stated that their lands are productive, and they therefore hope that the population will not lose their lands. If they are transferred to another location, they prefer a location with good land for farming, since their base of sustenance is agriculture.

- The participants in Maganja and the Coastal Zone stated that they are not in favour of resettlement. However, if it is unavoidable, they would prefer to be transferred to another location with the same conditions in terms of marine resources.

When asked about being host communities, all respondents noted that:

- if they are required to receive people from other areas impacted by the Project, they expect that the incoming residents will respect their way of life; and

- during the phase when land is given out for farm plots or residences, the process should be clear to prevent any conflicts.

9.17 SHIPPING AND NAVIGATION

For the Shipping and Navigation Study, the Study Area is defined as Area 1 and the vicinity of the Mamba Gas Field in Area 4.

9.17.1 Background

The Mozambique Channel is situated in the Indian Ocean, between the latitudes 10ºS and 25ºS, with a length of approximately 1,000 nautical miles (1,600km), a width that varies between 250 and 600 nautical miles (400 to 950km), a minimum width of approximately 287.5 nautical miles (460km) between Angoche (in Mozambique) and TambohorYear (in Madagascar), an average depth of around 3,897m and a maximum depth of 7,455m (Java Atoll) (1).

The Mozambique Channel is a preferential navigation route for the maritime links between the USA, the Persian Gulf, Asia and southern and East Africa, and hosts a variety of ships including oil tankers, container ships, general cargo ships and cruise liners, among other types. Furthermore, the Mozambique Channel is a route for regional cabotage (2) in southern and East Africa, as well as for Mozambique domestic cabotage (3).

The Mozambique Channel became an established commercial navigation route when Arab traders used the channel in their commercial voyages to the southern and East Africa region, long before the arrival of Vasco da Gama in Mozambique *(*in the 15th century*)* on his discovery of the maritime route to India.

Despite it being a historically busy navigation route, the channel does not have an officially and formally established Traffic Separation Scheme (4). Instead, navigation is based on customary traffic lanes (5), even though the International Maritime Organisation (IMO) has put in place criteria and guidelines for the establishment of a Traffic Separation Scheme. Such a scheme is incorporated in Chapter V, Regulation 8, of the IMO International Convention on Safety of Life at Sea (SOLAS 74), related to the Organisation of Maritime Traffic (6).

Global economic growth and the increase in maritime trade has led to an increase in maritime traffic in the Mozambique Channel, peaking at the same time as the oil industry in the Persian Gulf. As such, the Mozambique Channel became the preferred route for oil tankers travelling from the Persian Gulf to the US, and East and southern Africa. Commercial fishing activity also

(1) Marine Highway Project preliminary study report, 1998.
(2) Transport in coastal waters.
(3) Transport between two points within a country.
(4) Navigation Lanes formally established in busy traffic areas or busy port entrance channels.
(5) Informal Navigation Lanes used in busy traffic areas/busy port entrance channels.
(6) IMO Convention SOLAS 74, consolidated Edition of 1997.

contributes to traffic in the Mozambique Channel, especially tuna fishing vessels (see *Section 9.7.6*).

Since the 1960s, considerable portions of the western parts of the Mozambique Channel have been subject to scientific expeditions related to oil exploration seismic surveys. These surveys fall within the jurisdictional waters of South Africa, Mozambique, Tanzania and Kenya.

9.17.2 Recent Developments

A Marine Highway Project has been designed for the Mozambique Channel through funding by the World Bank Global Environment Facility (GEF). The main objective of this project is to implement a platform for the prevention of marine oil pollution. It also includes the management of maritime traffic by establishing a Traffic Separation Scheme, bearing in mind that preventing accidents is an important aspect of preventing oil pollution. The Marine Highway Project has the following participating and beneficiary countries: South Africa, Comoros, Madagascar, Mauritius, Mozambique, Kenya, Seychelles, Somalia and Tanzania. South Africa is the funding signatory on behalf of the group of participating and beneficiary countries. The implementation of the project is under the responsibility of the South African Maritime Authority (SAMSA) in partnership with the Indian Ocean Commission (IOC), under the supervision of a Steering Committee composed of representatives of the participating and beneficiary countries. All preparatory work has been concluded and the Funding Agreement was signed in September 2007 (1).

During the last years, marine traffic in Cabo Delgado Province also includes the movement of several vessels involved in seismic and drilling activities for hydrocarbon exploration in the Rovuma Basin area of northern Mozambique (2).

9.17.3 Ports and Shipping Movement in and around Area 1 and the Mamba Gas Field

There are two ports within Cabo Delgado Province, namely Mocímboa da Praia and Pemba. The port of Mocímboa da Praia has a small quay, whereas the Port of Pemba is a conventional deepwater port with associated equipment and infrastructure.

The commercial traffic volumes to and from these ports has been decreasing over the last few years. According to the registry of the Administração Marítima (Maritime Authority) in Pemba, very few commercial ships called at the Port of Pemba in 2010. Between 2007 and 2009, the average number of calls per year at the Port of Pemba was around 82 commercial ships per year. In 2010, this dropped to 39, including both long course and cabotage traffic

(1) World Bank Report on the project. The status of this project is unclear.
(2) INP – National Petroleum Institute, Mozambique.

(*Table 9.59*). However, due to the intensive hydrocarbon exploration activity in the Rovuma Basin, 171 vessels involved in hydrocarbon exploration called at the Port of Pemba during the same period.

A similar pattern was observed in 2011. During this period, only 38 commercial ships called at the Port of Pemba, compared with 215 vessels involved in hydrocarbon exploration.

Table 9.59 Movement of Ships at the Port of Pemba in 2010 and 2011

Year	2010	2011
Number of commercial ships	39	38
Number of survey ships	172	215
Total number of ships	211	253

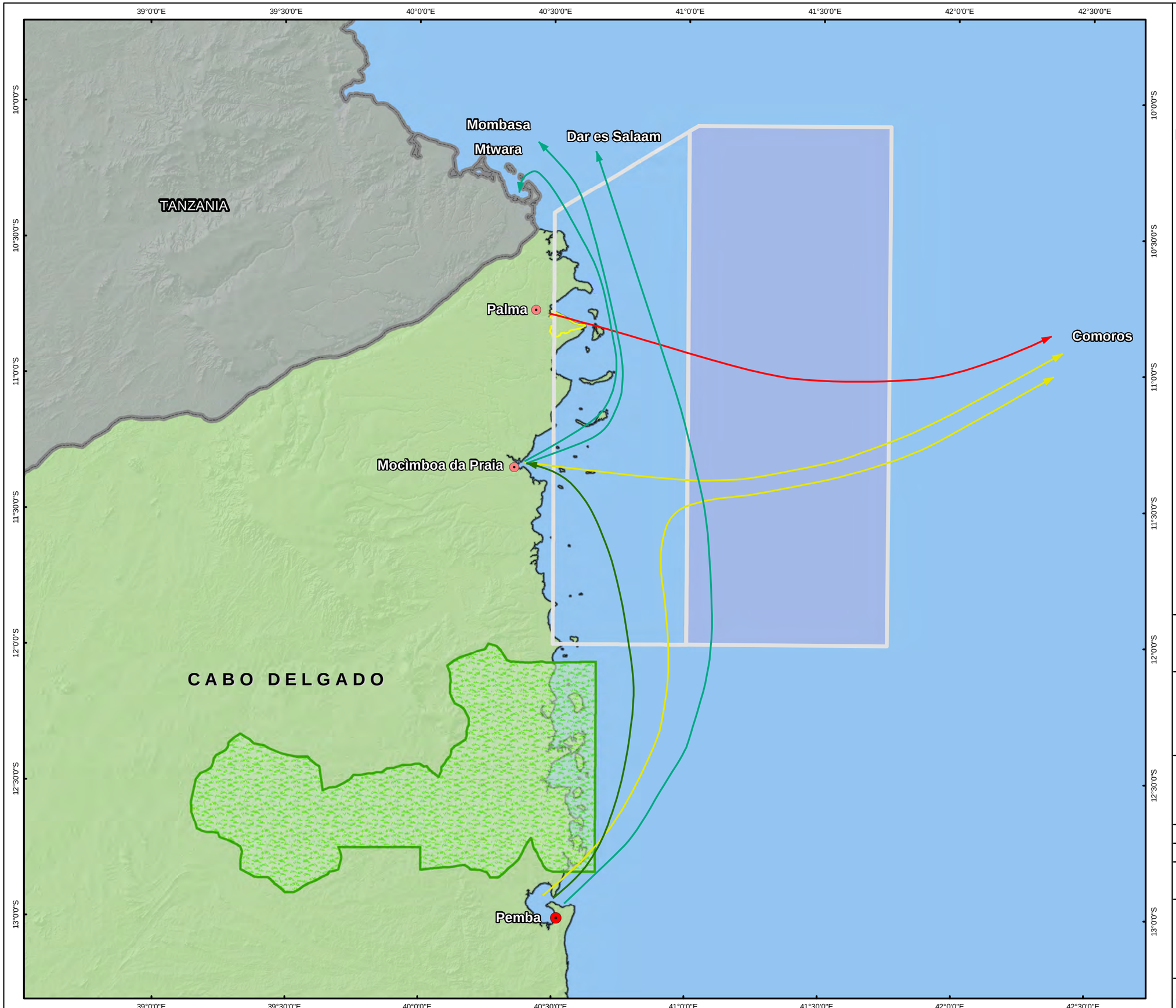
Source: Maritime Administration – Pemba/CFM Office Pemba Branch.

Between 2008 and 2010, the Port of Mocímboa da Praia was called on by just a single ship carrying a containerised cargo (mainly timber). According to the Maritime Authority representative in Mocímboa da Praia, only four commercial ships called at the port in 2011.

There is no registry of conventional ships arriving in Palma Bay; however, it appears that only local small transport and fishing crafts use Palma Bay. In addition, some small recreational boats engaged in tourism (used support to diving and sightseeing activities) have been observed cruising the Study Area.

9.17.4 Types of Vessels

The shipping activity in and around Area 1 and Area 4 in the Rovuma Basin comprises mostly small-scale traffic, some maritime traffic transiting the Mozambique Channel, vessels engaged in hydrocarbon exploration and scientific research, tourism cruise ships, tourism small boats, and some medium-size local and regional cabotage vessels – primarily traffic travelling from Mocímboa da Praia to the Port of Pemba, as shown in *Figure 9.39*.

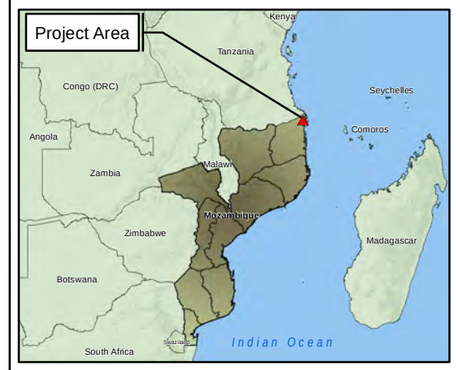


Legend

- Capital City of Cabo Delgado
- Town
- Afungi Project Site
- Boundary with Tanzania
- Cabo Delgado Province
- Quirimbas National Park
- Area 1
- Area 4

Cabotage Routes

- Domestic Cabotage
- Regional Cabotage: Comoros
- Regional Cabotage: Tanzania and Kenya
- Informal Traffic: Mozambique-Comoros



MAIN MAP SCALE:

0 20 40 60 80

Kilometers

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TITLE:

Figure 9.39: National and Regional Cabotage Routes

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 1 450 000

DRAWING: National and Regional Cabotage Routes in Area 1.mxd

REV: A

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Impacto Projectos e Estudos Ambientais

ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

SIZE: A3

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The informal traffic (red line in *Figure 9.39*) indicates local transport routes by artisanal boats used by the population, from the mainland to the Comoros islands and vice versa.

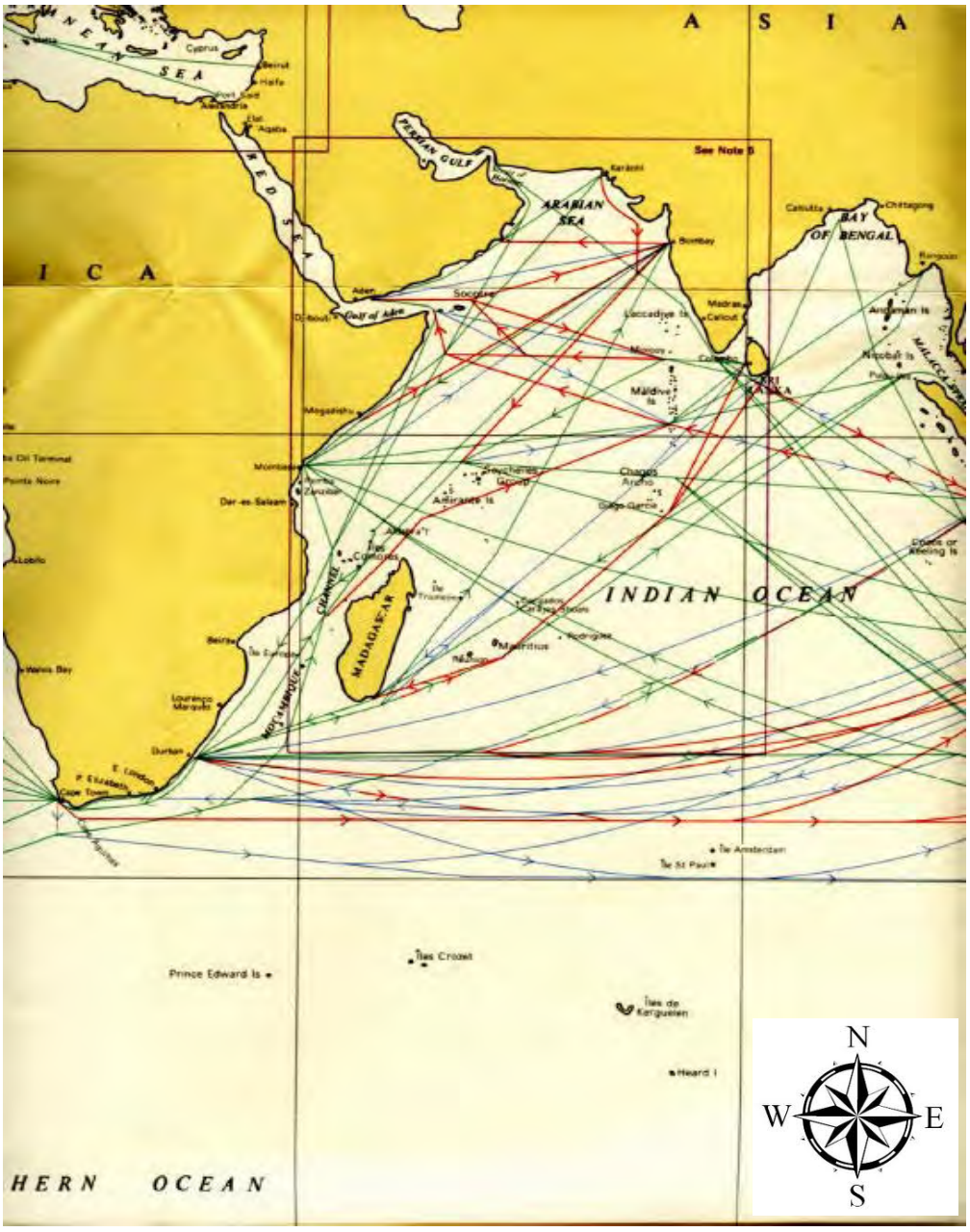
The small-scale shipping activity is characterised by local transport from the mainland to the islands and vice versa, small-scale fishing and recreational navigation between the islands of the Quirimbas Archipelago for tourism purposes.

The types of boats/vessels used in and around the Study Area vary from artisanal locally built boats *(*wooden canoes*)* to conventional vessels fitted with modern navigation equipment.

9.17.5 Actual and Proposed Shipping Routes in the Offshore Study Area

There are no formally established navigation routes within the Offshore Study Area, but regularly used routes have been adopted based on common practice. Information collected and processed by some companies, organisations and associations linked to the shipping industry show how ships have been navigating in the Indian Ocean, including the Mozambique Channel (*Figure 9.40)*.

Figure 9.40 Traditional Navigation Routes in the Indian Ocean and Mozambique Channel



Source: INAMAR, 2010.

23°30'0"E 29°0'0"E 34°30'0"E 40°0'0"E 45°30'0"E 51°0'0"E

2°0'0"S 7°30'0"S 13°0'0"S 18°30'0"S 24°0'0"S

Uganda
Kenya
Somalia
Rwanda
Burundi
Congo (Democratic Republic of the)
Tanzania
Seychelles
Comoros
Angola
Malawi
Zambia
Mozambique
Zimbabwe
Madagascar
Namibia
Botswana
Swaziland
South Africa
Lesotho

18°0'0"E 23°30'0"E 29°0'0"E 34°30'0"E 40°0'0"E 45°30'0"E 51°0'0"E

Legend

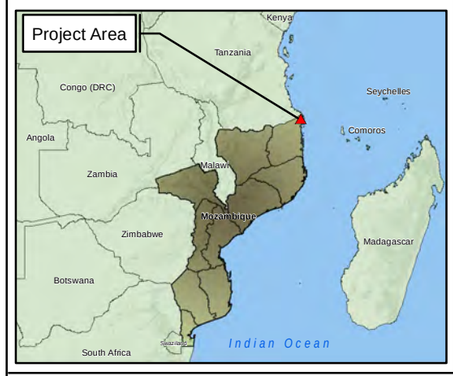
Maritime Traffic Distribution Routes

- Traffic from Persia Gulf to Africa, Americas and Europe
- Traffic of trans-shipments of Oil
- Trans-shipments of general cargo

- Area 1
- Area 4

Mozambique Provincial Boundary

- Inhambane
- Manica
- Sofala
- Maputo
- Tete
- Gaza
- Cabo Delgado
- Niassa
- Nampula
- Zambezia



MAIN MAP SCALE:

0 100 200 300 400 500

Kilometers

N

TITLE:

Figure 9.41: MaritimeTraffic Routes In the Mozambique Channel

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
DRAWN: AB	APPROVED: KG	SCALE: 1 : 12 400 000

DRAWING: Maritime Traffic Distribution Routes Moz Channel.mxd

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Impacto Projectos e Estudos Ambientais

ERM

Projection: UTM Zone 37 S Datum: WGS84
Source: DIVA-GIS. Impacto, 2012.
Inset Map: Esri Data & Maps

SIZE: A3

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Figure 9.41 above shows the present traffic lanes being used by shipping in the Mozambique Channel, based on customary practice. The green lines represent the traffic from and to the Persian Gulf to Africa, the Americas and Europe. The red lines indicate the trans-shipments of oil, and the blue lines the trans-shipments of general cargo (grains and other commodities).

The proposed routes of the Marine Highway Project are shown in *Figure 9.42*.

Figure 9.42 Sketch of the Proposed Routes of the Marine Highway Project

Source: Marine Highway Project Report, 2008.

The Marine Highway Project in the Mozambique Channel has designed three scenarios, aiming at dividing the traffic by classes of ships according to their type and use: tankers, chemical ships, nuclear ships, general cargo ships, bulk cargo ships, container ships, passenger ships and navy vessels. The project

also establishes navigation lanes based on ship type and use. The three proposed options under consideration are:

Scenario 1: the marine highway is routed a minimum distance of 20 nautical miles from the coastline, and has a distance of 10 nautical miles of separation between the navigation lanes in each direction. The route has a minimum depth of 1,000m. Being only 20 nautical miles from the coast, this option presents a risk of pollution exposure in the event of an accident involving oil tankers.

Scenario 2: the marine highway is routed a minimum distance of 50 nautical miles from the nearest point on the coastline, and has a distance of 10 nautical miles of separation between the navigation lanes in each direction. Being quite far from the coast, this option minimises the risk of pollution reaching the shore in the event of an accidental spill. Conversely, the distance from shore means that in the event of an emergency, search and rescue operations would take longer to reach stricken vessels.

Scenario 3: this option combines scenarios 1 and 2. The marine highway passes at a distance of 35 nautical miles from the nearest point of the coastline. As with the above scenarios, the marine highway maintains a 10 nautical miles distance of separation between the navigation lanes in each direction and has a minimum depth of 1,000m.

It is unclear when this project will be implemented.

9.17.6 Piracy in the Vicinity

Piracy activities in the Indian Ocean are increasing as a result of the continuous absence of an effective government in Somalia, where piracy has been used not only as a way of accumulating wealth but also as a means of supporting tribal wars and skirmishes (1).

After unsuccessful piracy attacks on ships in the south-west Indian Ocean in 2008 and 2009, a Mozambican fishing vessel *(M/V Vega 5)* was hijacked near the Bazaruto Archipelago (offshore of Inhambane Province in southern Mozambique) in December 2010, taken to Somalia and subsequently used as a mother vessel for pirate attacks. Since 2009, some vessels in transit along the Mozambique Channel, as well as companies involved in hydrocarbon exploration in the Rovuma Basin, have reported threats of piracy attacks. This was highlighted in a workshop on piracy organised by the Embassy of Norway in cooperation with the Government of Mozambique in 2011.

In September 2011, two attacks were made against ships in the Mozambique Channel, in the area of the Graciosa Island near Madagascar. The attacks were unsuccessful as the targeted ships had armed protection on board, and had initiated their anti-piracy contingency plans.

(1) NATO Shipping Centre, Information Report to the Maputo Workshop, May 2011.

Piracy Protocols and Agreements Signed by Mozambique

Mozambique is a State Party to the SUA Convention 1988 and SUA Protocol 1988 (bound from 8 April 2003), two IMO instruments on the Suppression of Unlawful Acts against Ships at Sea adopted in 1988 and in force from 1 March 1992. Nevertheless, the country still lacks specific domestic legislation to implement the provisions of these two instruments.

Mozambique is also a signatory State to the Djibouti Code of Conduct on Piracy and Armed Robbery against Ships for the Indian Ocean and Gulf of Aden, which was developed and adopted under the IMO umbrella as a platform for regional cooperation, and also as part of the international community efforts to combat piracy and armed robbery against ships.

In March 2011, the Government of Mozambique joined the International Contact Group on Piracy off the Coast of Somalia (CGPCS) during the forum session at the United Nations headquarters in New York. This group comprises 28 nations with naval fleets patrolling the main navigation routes, including a number of countries located around the Indian Ocean. It is aimed at providing protection to ships transiting the areas affected by piracy and armed robbery.

Currently, the Mozambican Navy is partnering with other key national institutions to carry out some patrolling actions, particularly in the Rovuma Basin. The Mozambican Navy is also in the process of designing a new model of maritime surveillance to address situations regarding piracy and armed robbery at sea better.

9.18 ARCHAEOLOGY AND CULTURAL HERITAGE

9.18.1 Introduction

Archaeology and cultural heritage includes tangible and intangible resources such as places, oral traditions and rituals. In the Law for Protection of Cultural Assets (Law No. 10/88, dated 22 December), a heritage resource is defined as "*any place or object of cultural significance ie of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance*".

9.18.2 Historical Background

The Project Onshore Footprint is located in Afungi Peninsula, and comprises the southern shore of Palma Bay (originally known as Tungi Bay). This area was once ruled by a local sociopolitical entity, and the area was known as the Sultanate of Tungi . The archaeology and cultural heritage of Afungi Peninsula is strongly influenced by the Sultanate, which reigned from Cabo Delgado Peninsula on the northern shore of Tungi Bay. *Figure 9.43* illustrates

the key archaeological sites within the East African region, some of which are referred to in this section.

Figure 9.43 Map Showing Principal Archaeological Sites along the East Africa Coastline

Source: Adamowicz, 2012.

The Sultanate of Tungi [(1)]

Tungi is the historical name of the Swahili sultanate that ruled on the Cabo Delgado Peninsula until 1877. During the 18th and 19th centuries, its main political centre was located 5km west of the peninsula's tip, in the vicinity of the village today known as Kiwiya (Quiwia) (see *Figure 9.44*). It is believed that Kiwiya was previously known as Tungi, although the name also extends to a larger area, which was under the control of the Sultan of Tungi. Ruins of

(1) This section is based mostly on research and publications by Prof. Dr. Eugeniusz Rzewuski at Warsaw University (UW) in cooperation with Eduardo Mondlane University (UEM) – see: Rzewuski forthcoming.

the sultans' palace and three graves of Tungue sultans are found in the area today (Rzewuski, 1991).

Figure 9.44 ***Cabo Delgado Peninsula Showing the Location of Tungi – the Capital of the Sultanate of Tungi***

Source: Adamowicz, 2012.

The geographical extent of the political territory of Tungi is not known (1) but may include the Afungi Peninsula. The geographical location and proximity of Tungi to old coastal centres such as Kilwa and Vamizi Island made Tungi a prominent strategic centre in the region. The ruins of the large palace of Tungi provides a direct testimony that the settlement knew times of good economic prosperity, probably connected with the 18th to 19th century slave trade in the region. Evidence exists to suggest that Tungi Bay was used as an important natural harbour for the anchorage of vessels travelling to the old trading centre located on Vamizi Island (2).

The first known attestation of the name Tungi in European sources is, according to Liesegang (1989), registered in a Portuguese document dated 1744. Tungi became known to historians in the context of "*the last episode of the Arab-Portuguese quarrel in the waters of the Western Indian Ocean*" (Bennett, 1987: 18) for the border dispute between Portugal and Zanzibar in the 19th century. Both parties in the conflict claimed their sovereignty rights over Tungi. In 1778, an armed Portuguese expedition was sent to the Sultanate of Tungi and,

(1) Bennett (1987) refers to Loarer, a French commercial investigator who reported in 1848 that the zone of influence of the sultan Muhammad bin Sultan of Tungi reached, by that time, some 120 miles deep into the continent. Bennett himself describes the location of Tungi as stretching "*north of the Minanganiriver*", which is not considered precise. He does not mention the existence of the ruins of the palace.
(2) As described by Ahmad bin Majid in the 15th century. Traditions collected by C. Velten, Prosa und Poesie der Suaheli, Berlin 1907, reproduced partially in Freeman-Grenville 1962:221-6. Rzewuski owe to Prof. C.S.P. Freeman-Crenville the information that in the same Velten's collection there is a text on the history of Tungi but it is still unavailable to Mozambican scholars.

since then, Tungi sultans played a policy of a balanced double loyalty. At least one of them, Hassani (Assani), used to receive regular payments from the Portuguese authorities in the 1820s to 1830s. The Portuguese–Zanzibar dispute involved Great Britain and Germany, as 'intermediaries' who had their own interest in the area. It was ended by the Portuguese military annexation of the disputed land in 1877. A few years later, the colonial border between the Deutsche Ostafrika (German East Africa) and Africa Oriental Portuguesa (Portuguese East Africa) was mapped along the Rovuma River, some 40km north of Tungi, which was then incorporated into the Portuguese colony.

In the Comoros chronicles (1), it is mentioned that the first people to settle on Ngazija (Grande Comore) originated from Tungi (Rotter, 1976). The same Comorian chronicle identifies Tungi among the first Swahili towns founded (Rotter, 1976: 25–27 in Rzewuski, 1991: 193). The name of the settlement also appears in oral traditions connected with the first sultan of Kilwa (Sultan Ali), who waged war against Tungi (2).

Today, land rights in some settlements in Cabo Delgado Peninsula and Afungi Peninsula belong to Makwa descendants of the Sultan of Tungi, dating back to late 17th and early 18th centuries. Over the last 200 to 300 years, the lands have been farmed or used for fishing or slave trade.

Written and Oral Manuscripts – Tungi

Oral and written traditions indicate that Tungi was ruled by the Shirazi dynasty, whose descendants still today claim to have their roots in the Comoros, Angoche and Kilwa. According to studies undertaken by Polish linguist Eugeniusz Rzewuski (1991), the corpus of oral and written texts comprise two written manuscripts and one oral narrative, referred to as TUNGI - 1, TUNGI - 2 and TUNGI - 3 respectively. These provide an insight into the Shirazi and Matungi tribes and the history of Tungi. These were collected/recorded in August 1988 from Palma, and are titled as follows:

- TUNGI – 1: Old events concerning the Shirazi Tribe;
- TUNGI – 2: Genealogical document of the Matungi Tribe; and
- TUNGI – 3: Oral manuscript by Muhammad bin Thabiti.

The texts provide some information relevant to the ethnohistory of Tungi (Mbobo and his Wampambe people are said to be the first inhabitants and to have come from Nyassa) and to the history of Shirazi migrations along the Mozambican coast. Today in Palma and Kiwiya, the Shirazi constitute the traditional elite (3). Two authors of the manuscripts described above belong to

(1) Chronicles from the Comoros Islands.
(2) Traditions collected by C. Velten, Prosa und Poesie der Suaheli, Berlin 1907, reproduced partially in Freeman-Grenville 1962: 221-6.
(3) In Kiwiya, the Shirazi comprise the major clan (*kabila*) – 32, the second in rank being Nausi (10%), who also claim their oriental origin and, according to local tradition, were the first immigrants to settle in area adjacent to Tungi Bay (numerical data taken from Lundin and Loforte, 1988: 12).

this tribe [1], and Muhammed bin Thabiti is the most respected leader of the Muslim community (*shehe*) in Palma. One characteristic and distinctive element in the Shirazian traditions of Tungi is the prominence given to the female ancestors. In the genealogical chain, only the names of women are given, whereas their husbands' names are omitted in several cases (eg Pendezeni, Amina).

According to traditional leaders, the ancient document TUNGI - 1 (shown in *Figure 9.45*) should be protected in a museum.

Figure 9.45 Ancient Written Manuscript

Source: Adamowicz, 2012.

(1) AbdulahibnSalimMungoji, the author of TUNGI - 1, although not identified, must be associated with the descendants of the royal family from Angoche (Ngoji), as his nisbaMungoji indicates.

Figure 9.46 Cultural Traditions are Well Preserved Locally and Shared with Youth

Source: Adamowicz, 2012.

The rulers/sultans who reigned over the Sultanate of Tungi, and the period they ruled, are outlined in *Table 9.60*, according to the oral and written evidence outlined in TUNGI - 1.

Table 9.60 Rulers/Sultans

Rulers/Sultans	Dates	Comments
Unknown names Sultan Ali ibn al-Hassan (since 957) - from Kilwa, waged war against Tungi	Since 1000 AD	Dynasties ruling from Kilwa (1). Limited excavations and test pits in Kiwiya may provide more data for absolute (C14) and relative chronology in this area. [Early Kilwa pottery. Some attributes of later earthenware at Kiwiya found in association with Sassanian Islamic (?) tin glazed blue-green.]
	1310–1333	Under control of the Sultan al-HasanibnSulaiman from Kilwa (?)
Unknown names	After 15th century	Local dynasties, usurpers and clans controlled by Comoros, Oman or Zanzibar Sultanates.
	17th – 18th century AD	Tungi area under rule of local clans Wampambe from Kilindi (Late Monapo pottery).
AhmadiHassani	End of 18th century AD	From Angoche.
Selemani	1st half of 19th century AD	From Kilwa.
Yussufu	1st half of 19th century AD	Son of Selemani from Kilwa.
Idighami	1st half of 19th century AD	Dispute on succession with Shababi, husband of his aunt ruled shortly and simultaneously with Yussufu.

Rulers/Sultans	Dates	Comments
Hassani II and Hassani III	1828–1830 AD	AssaneMenheMosalonaChiraze (in Portuguese documents). Ruled simultaneously and both used to receive regular payments from the Portuguese authorities in the 1820s to 1830s.
Muhammadi	1837-1860	Nicknamed Nchingama.
Muhammadi and Muhammad YussufuHamissi	1858 AD	Date from inscription of the graves deciphered by Monteiro (1966: 56) (in Rzewuski 1991: 209).
Muhammadi	To 1860 AD	From Portuguese documents.
Abdurabi	1872 AD	Date from inscription of the graves.
Aburari	2nd half 19th century AD	Dispute on succession with paternal uncle Abdelazizi. Zanzibar and Portuguese interference.
Abdelaziz *(capitão-mor)*	1877 AD	Military annexation of Tungi by Portuguese. End of the Sultanate.

Notes:
(1) The history of Kilwa begins in 960-1000 AD when one of seven sons of a ruler of Shiraz, Persia Ali ibn al-Hassan Shirazi, steered down the African coast. Ali is said to have purchased the island of Kilwa from the local Bantu inhabitants. According to one (Strong, 1895), Kilwa was originally owned by a mainland Bantu king named Almuli. At the zenith of its power in the 15th century, the Kilwa Sultanate owned or claimed overlordship over the mainland cities of Malindi, Inhambane and Sofala and the island-states of Mombass, Pemba, Zanzibar, Mafia, Comoro and Mozambique (plus numerous smaller places from Rovuma River, Quirimba Island, Angoche and Quelimane to Sofala) - essentially what is now often referred to as the Swahili Coast. Kilwa also claimed lordship across the channel over the myriad of small trading posts scattered on the coast of Madagascar.

Language and Cultural Significance

Palma and its surroundings is the only area along the Mozambican coast where the Swahili language is spoken. In addition, the language situation within the region represents a rare type of a stabilised 'gender diglossia' (1). The use of Swahili seems to be a factor helping to maintain the social status and cultural identity of a *mwungwana* (ie civilised person) rather than a recent linguistic acquisition. Gender diglossia is also observed north of Lindi in Tanzania (see *Figure 9.47*).

9.18.3 Archaeological Survey

Overview

The archaeological survey was undertaken on Afungi Peninsula (which includes the Afungi Project Site), Palma and Cabo Delgado Peninsula in October 2011. The latter areas do not fall within the direct Project Footprint; however, due to the proximity and cultural heritage value of the known archaeological and historical sites in these areas, they were considered in the scope of the field investigation. The surveys undertaken involved identifying known archaeological and historical sites with cultural significance in the area, which were then further investigated. The extent of the survey area is shown in *Figure 9.47.*

(1) A situation in which two languages are used under by men and women within a community.

A number of sites and artefacts of cultural significance were recorded during the field survey, and these are described in the sections below. Some sites, particularly those in the Maganja area of Afungi Peninsula, were surveyed in detail and recorded during a previous study in 2008. This previous survey was undertaken by an author leading the Circle of Interest of Cultural Heritage of the League of Scouts of Mozambique (LEMO) in 2008 (1). Other sites were recorded during a trip from Palma to Pemba. Most of the recorded sites were sacred places.

Decades of agricultural activity have resulted in disturbance to the upper 30cm of soil in the area surveyed; however, the presence of sites can still be identified by the occurrence of artefacts, and deposits sometimes remaining intact at depth.

Some of the archaeological and cultural heritage evidence observed within the survey areas points towards a period of unrest (wars between Swahili towns, invasions, slavery trade, colonial occupation, etc), which had both sociopolitical and economic consequences and from which it is considered the local people have not recovered.

(1) Undertaken in conjunction with the League of Scouts of Mozambique (LEMO), in collaboration with United Nations Educational, Scientific and Cultural Organization (UNESCO) and ICOMOS (International Council on Monuments and Sites).

40°20'0"E 40°30'0"E 40°40'0"E 40°50'0"E

10°30'0"S 10°40'0"S 10°50'0"S 11°0'0"S

TANZANIA

Quionga

Assame

Calomba

Quiwia

Cabo Delgado Peninsula

Issa

Tungi Bay

Palma

Tecomaji Island

Nkalanga

Macala

Senga

Quitupo

Afungi Peninsula

Maganja

Nkumbi

Matapata

Aienda

Rongui Island

Bawala

Olumbe

A

7. Mbuizi 1
5. Mbuizi 2
Tungi
9. Mosque
8. Kiwiya (Village)
10. Tungi 2
11. Tungi 1
Quiwia

B

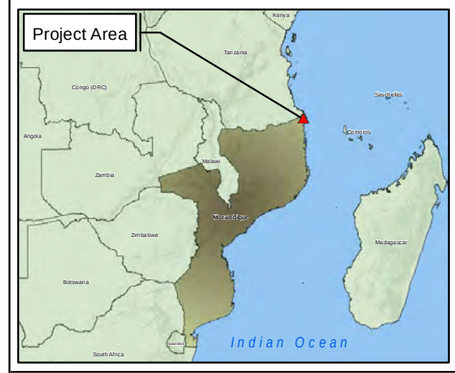
12. Palma 2
13. Palma1
14. Shell Midden
Palma

C

15. Ngodje 1
16. Ngodje 2
29. Kitupo 1
30. Kitupo 2
31. Kitupo 3
32. Kitupo 4
Quitupo
17. Maganja 1
18. Maganja 2
19. Old Maganja
20. Maganja 3

Legend

- Villages / Settlements
- Sites of Archaeological Importance
- Survey Tracks
- Regional Roads
- Afungi Project Site



MAIN MAP SCALE:

0 5 10 15

Kilometers

N

TITLE:

Figure 9.47:
Archaeology Survey Area and Location of Sites

CLIENT:

Anadarko Moçambique Área 1, Lda

eni

DATE: Oct 2013	CHECKED: IE	PROJECT: 0133576
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Afungi Peninsula

The sites investigated in the Afungi Peninsula are shown in *Figure 9.47* and outlined in *Table 9.61* below. The area surveyed included the Afungi Project Site and Maganja, a settlement on the tip of Afungi Peninsula. The finds were dominated by artefacts from the Late Iron Age (LIA) and included finds from the Early Iron Age (EIA).

Table 9.61 Sites of Archaeological Importance Found in Afungi Peninsula

Ref No.	Location	Longitude	Latitude	Type	Date Observed
1040Dc01	15. Ngodje 1 (E12)	S10 47 34.7	E40 31 20.0	LIA	21-10-2011
1040Dc02	16. Ngodje 2 (E14) (1)	S10 47 47.2	E40 32 10.5	LIA	21-10-2011
1040Dc03	29. Kitupo 1 (E29)	S10 48 51.0	E40 31 03.6	LIA	23-10-2011
1040Dc04	32. Kitupo 4 (E32)	S10 49 18.9	E40 31 16.3	LIA	23-10-2011
1040Dc06	30. Kitupo 2 (E30)	S10 48 54.3	E40 31 02.6	LIA	28-10-2011
1040Dc07	31. Kitupo 3 (E31)	S10 49 08.8	E40 30 59.5	EIA and LIA	28-10-2011
1040Dc08	19. Old Maganja (E19)	S10 50 21.3	E40 36 25.7	LIA	29-10-2011
1040Dc09	17. Maganja 1 (E2)	S10 49 52.1	E40 36 25.6	EIA and LIA	29-10-2011*
1040Dc10	18. Maganja 2 (E3)	S10 50 10.5	E40 35 55.6	LIA	29-10-2011*
1040Dc11	20. Maganja 3 (E4)	S10 50 49.9	E40 36 02.8	LIA	29-10-2011*

Legend:
(1) Ngodje Zone. This 'zone' seems to be too large for a single site name and quite likely should be considered as two sites of archaeological or cultural interest.
* These were initially surveyed in 2008, as described in *Section 9.18.3*.

Ten archaeological sites were recorded in the area of Afungi Peninsula surveyed, as well as one abandoned sacred place and several burial sites. Most of these sites have been affected by extensive cultivation, and those closer to the coast have been influenced by sea erosion. Among the finds collected were beads, shells (including pearl oysters, family Pteriidae), fish bones and potsherds. The quantity and diversity of shells was regarded as notable, and are shown in *Figure 9.48.*

Figure 9.48 Shell Midden at Afungi Peninsula

Source: Adamowicz, 2012.

Of 427 potsherds observed, the majority were from rims of open bowls, inturned bowls and necked vessels. Some potsherds of pottery with upturned and carinated vessels were also found, as shown in *Figure 9.49*.

Figure 9.49 Samples of Potsherds Collected at Afungi Peninsula

Source: Adamowicz, 2012.

The old Tungi decorative pattern of pottery found in the area shows many similarities with various periods of Kilwa pottery. Previous research done in northern Mozambique and the field survey undertaken supporting this study confirm historical and archaeological richness in Palma District. In the Afungi Project Site and Surrounds, sites 15 (Ngodje 1) and 18 (Maganja 2) are considered to be of particular archaeological importance, as the sites comprise shell middens and potsherds. These sites are also mentioned in the Tungi chronicles. All other sites investigated are considered to be of low heritage significance.

Palma Town

The area of Palma town was investigated, as it is the main town near the Afungi Project Site and it is considered that the cultural heritage of the town may be impacted by a population influx into the area. In Palma town, two archaeological sites were observed and are considered to be of particular archaeological importance: site 13 (Palma 3), which includes ruins of a slave market; and site 12 (Palma 2), a burial ground (see *Figure 9.50*). The locations of these are listed in *Table 9.62*. The slave market in Old Palma (lower Palma) comprises a structure possibly more than 200 years old. It is likely that the buildings were demolished following Portuguese military occupation.

Table 9.62 Sites of Archaeological Importance Found in Palma Town

Ref No.	Location	Longitude	Latitude	Type	Date Observed
1040Cd01	13. Palma1 (E02)	S10 46 06.7	E40 28 31.4	EIA and LIA	26-10-2011
1040Cd02	12. Palma 2 (E03)	S10 45 56.5	E40 28 54.6	LIA	26-10-2011

Ref No.	Location	Longitude	Latitude	Type	Date Observed
1040Cd03	14. Shell midden (E04)	S10 46 32.8	E40 29 48.0	LIA	26-10-2011

Figure 9.50 Ruins of a Slave Market (Top Left and Right) and a Burial Ground (Bottom)

Source: Adamowicz, 2012.

Cabo Delgado Peninsula

Due to the cultural heritage importance of the Sultanate of Tungi in a regional context, and the proximity of Tungi to the Afungi Project Site, Cabo Delgado Peninsula was included in the investigation. The survey in Cabo Delgado Peninsula considered seven known archaeological sites (as shown in *Table 9.63*), including Tungi, Kiwiya and Mbuizi. Two sacred places, several ruins (palace, mosques and houses) and burial grounds (tombs) were observed that are associated with the Sultanate of Tungi, as documented in Arab, Swahili and Portuguese literature. Each of these sites is considered to be of particular archaeological importance. Finds originate from recent times, the EIA and, predominantly, from the LIA, as shown in *Table 9.63*. The evidence observed provides insight into the period between the Early Community (3rd to 6th century AD) to the 12th century, but mostly from the 15th century to 19th century AD.

Table 9.63 Sites of Archaeological Importance Found in the Cabo Delgado Peninsula

Ref No.	Location	Longitude	Latitude	Type	Date Observed
1040Da04	5. Mbuizi 2 (E19)	S10 40 03.0	E40 34 11.7	LIA	22-10-2011
1040Da05	7. Mbuizi 1 (E20)	S10 39 46.1	E40 34 35.6	LIA	22-10-2011
1040Da06	11. Tungi 1(E62)	S10 41 14.3	E40 35 09.7	EIA & LIA.	27-10-2011
1040Da07	10. Tungi 2 (E22)	S10 41 20.8	E40 35 27.0	LIA	27-10-2011
1040Da08	8. Kiwiya (Village)	S10 41 14.3	E40 35 09.0	Recent	27-10-2011

Ref No.	Location	Longitude	Latitude	Type	Date Observed
1040Da09	9. Mosque (E61- 9)	S10 41 15.4	E40 35 09.8	LIA	27-10-2011

Ruins at the site of Tungi include a palace, two mosques, a small group of houses and two groups of tombs (shown in *Figure 9.51*), and probably date to the 18th century.

The ruins of many of the sites observed have been poorly conserved and heavily impacted from vegetation, as shown in *Figure* . The walls of a mosque (site 9) are close to collapse and the remaining part of the wall at Tungi (site 11) is visible only 1 to 1.2m above ground. The buildings were constructed from coral blocks. Archaeological material recovered in Tungi (sites 9, 10 and 11) indicated that the area once inhabited extended over 2km in diameter, suggesting that the town of Tungi may have once had a larger population than it does currently, or that the town was considerably more dispersed than modern and historic Swahili towns, possibly resulting from the slave trade.

Artefacts of local, Near East, Chinese and European origin were recovered in Tungi and Mbuizi. These artefacts include locally produced ceramics such as cooking pots, storage jars and small rather flat bowls or plates, the vast majority of which are damaged (as shown in *Figure 9.53*). Other local materials observed include red and white beads. Imported fragments of ceramics and glassware (bottle bases and stemware fragments) were also found and, despite their condition, a number of wares and forms were recognisable. Coarseware storage vessels were observed, as were a few examples of Chinese porcelain teacups and bowls.

Figure 9.51 Ruins of Tungi's Sultan's Palace, a Mosque and an Ancient Town Wall

Source: Nhatule and Adamowicz, 2012.

Most of the potsherds observed originate from simple vessels. During the survey, only decorated potsherds or significant shapes were found. The arrangement and motives are shown in *Figure 9.53* and include stamped motives, incisions, graphite and paintings. Pottery finds from the surface originate from the EIA (few from Nampula A and B Traditions), upper Kilwa, LIA Lumbo Tradition and recent Makonde pottery.

Figure 9.52 Modern Kiwiya Village (Left) and Kitchenware Used in Kiwiya Village (Right)

Source: Nhatule (left) and Czajkowski (right), 1988.

Figure 9.53 Samples of Potsherds Collected from Near Tungi

Source: Adamowicz,2012.

A tomb of an ancient Muslim queen, believed by the Mwani to be a place of good fortune, is found in Mbuizi on the north-east shore of Cabo Delgado Peninsula, and is shown in *Figure 9.54*. It is particularly sacred for the Mwani people and people travel from as far as Nampula Province to visit the site. A small hostel located near the site accommodates these pilgrims.

Figure 9.54 Mbuizi – Sacred Place for the Mwani

Source: Adamowicz, 2012.

9.18.4 Offshore Archaeology

Ship Remains and Debris

There are hundreds of recorded historical wrecks in the extensive coastal waters claimed by Mozambique. Shipwreck sites reflect a diverse group of vessels that vary in age, size and type. Some shipwrecks are of no archaeological interest, whereas others are unique. This uniqueness may be due to construction method, degree of preservation or the historical context in

which the vessels were sunk. The integrity of shipwreck sites depends on a number of factors, in particular the manner in which the vessel was wrecked, the conditions on the seabed and later disturbances.

Palma Bay was used as an important natural harbour for the anchorage of vessels travelling to the old trading centre located on Vamizi Island (1). Still today, major shipping lanes (the East Indies route) pass through the Offshore Project Footprint Area, and some shelter in the bay during bad weather. Historic data indicates that there are about three Portuguese and 12 African-Shirazi shipwrecks within Palma Bay, located near Kiwiya and in the waters adjacent to the Ngodza–Maganja coast of Afungi Peninsula.

Marine geophysical data (multibeam) within Palma Bay has been acquired and reviewed by Underwater Surveys (Pty) Ltd, which confirmed there are no large manmade structures apparent in the survey data. It should be noted, however, that without sidescan sonar, smaller archaeological anomalies of anthropogenic origin (including debris, areas of seafloor disturbance, etc) may have been missed.

The remains of an historical vessel are clearly visible today in Palma town, as shown in *Figure 9.55*. The origin of this vessel in not fully known but, due to the boat materials and design (made of iron and likely of British origin), it is believed to be a gunboat sent by the Sultan of Zanzibar with support from the British to protect the Tungi Sultanate against the Portuguese invasion. At the command of the Portuguese Captain José Raimundo de Palma Velho, boats from Zanzibar were sunk between 1876 and 1877.

(1) As described by Ahmad bin Majid in the 15th century.

Figure 9.55 Ship Remains in Palma (Note Afungi Peninsula in Background)

Source: ERM, 2012.

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