MASTER PLAN REPORT

2022-2042

ZIPA

CRM
LAND CONSULT (T) LIMITED

EXECUTIVE

SUMMARY

The Revolutionary Government of Zanzibar (RGoZ)and Zanzibar Investment and Promotion Authority (ZIPA) specifically, encourages investments in Five Free Economic Zones in Zanzibar. Four are in Unguja namely Fumba Free Economic Zone, Amaan Industrial Park, Maruhubi Free Port and Airport Free Port.

Free economic zones are economically considered as one of fundamental strategies deployed by the RGoZ to revamp the economy, following the decline of the clove industry in early 1990s. So this assignment was to review and plan for Fumba Free Economic Zone that was declared in 1992. It covers an area of 3,000 Ha. Fumba Free Economic Zone (FEZ) is proposed to accommodate various investment opportunities including offshore financial centre, marinas, lots for higher learning institutions, hotels and beach villas and centre for deep fishing and marine science. Other investment prospects in the Plan comprise medical city, cyber city, housing estates and apartments, conference facilities, commercial areas, special zone for micro small and medium scale enterprises sport centre, green open spaces where people can relax and enjoy nature.

Land use is central to many of the environmental and socio-economic issues facing society today. The purpose of the Fumba Free Economic Zone (FEZ) Master Plan for investments is to align and enhance socio-economic growth as well as to facilitate sustainable development through local and foreign direct investments, including environmental protection of the natural resources. It has been noted that various investors have applied to ZIPA for various investment projects, however, the challenges have been where to locate them and how to guide spatial growth and coordinate all development projects at the FEZ. The Fumba Free Economic Zone Master Plan (2022-2042) is the solution to guide and coordinate locations of different investments and supporting infrastructure as well as to provide guidelines for all future physical development decisions. It is a tool that helps ZIPA make the connection between spaces for investments in relationship to entire surrounding environment of the Free Economic Zone.

The preparation of Fumba Free Economic Zone Master Plan took a participatory process where a wide range of stakeholders were involved including consultative meetings with Shehas in 6 Shehias situated within the Fumba Free Economic Zone, in-depth interviews with district, regional and ministerial officials in various public institutions. Consultations were also carried out to the public utility agencies, parastatal organizations and investors. Previous plans, policies and legislations governing investments, land administration and free economic zones were reviewed to align the Master Plan with existing national policy and legal framework. Data was projected for the next 20 years (2022-2042) to analyse future land use requirements

Historically, Zanzibar is one of the oldest trading hubs in East Africa, consisting of 2 main islands Unguja and Pemba plus 52 small islands in the Indian Ocean. It is part of the United Republic of Tanzania with autonomous Government with the President, Cabinet, Legislature and Judiciary. Its strategic location and history makes the catchment of Zanzibar island reach beyond African continent to Middle East, Asia and Europe and in recent years the Americas.

The most important drivers of economic growth in Zanzibar include agriculture, tourism, service industry as well as the Blue Economy (BE). Blue Economy includes sustainable use of water resources, for instance, aquaculture products ranging from seaweed farming, fin fish and shell fish farming. Also, seaweed and value addition in seaweed such as production of perfumes, toothpaste, ice-cream, milk shakes and yoghurt. Additionally, Zanzibar is home to one of the best white sandy beaches in Africa plus the presence of attractive sea shore, caves and coral reefs. Indian Ocean provide potential area for BE i.e. possibility for fishing in artesian, deep sea water and improves marine transportation by construction of marinas. Fumba Master Plan provides investment opportunities for almost all BE activities. Furthermore, Fumba FEZ offers investment zone for Horticulture in order to make available various indigenous tree seedlings, vegetables and fruits seedlings which are to be planted all over the Fumba FEZ as provided in the terms and conditions for investments. Poultry and fish-farming is also encouraged.

Construction industry is expected to expand during the implementation of the master plan in a sense that infrastructure such as roads, housing, water, power, ICT, and health and education facilities are expected to be built. It was further observed that construction sector dropped from 10.6 percent in 2019 to 5.2 percent in 2020, the decline may be attributed by COVID 19 pandemic. However, this is expected to rise up again once Fumba FEZ starts development of aforementioned investments. It is noteworthy to state that the per capita income decrease was due to COVID-19 pandemic. The GDP growth rates stands at 1.3% in the year 2020. However, in the past experience GDP per capita has grown steadily from $523 in 2007 to $830 in 2016 and picked to $ 1,114 in 2019 before dropped $1,099. Steady increase of GDP makes Zanzibaris prime consumers for various opportunities being offered in the Fumba FEZ.

Being bordered by the sea in almost all sides, the zone is a suitable location for hospitality industry to locals and visitors who have available leisure time, disposable income, and are seeking for complete satisfaction. Hospitality industry has the potential to employ thousands both directly and indirectly. The industry include lodging, food and drink service, recreation, theme parks, meetings and events, travel and tourism. Fumba FEZ offers investment opportunities specifically for hotels, lodges and beach villas, sports and recreational facilities, marinas for yachts and boats to enable tourists to visit the surrounding small islands. Furthermore, Fumba FEZ provides venture opportunities for state-of-the-art international conference and exhibition centre or simply meetings industry. There are also shopping and passive and active recreational areas that allows visitors to relax in natural environment. There are also open spaces that can partially be utilized by locals and backpackers as camp sites for cheap accommodations. Therefore, Fumba FEZ is ideal for leisure and business travel.

Offshore financial center is one of the investment prospects. Fumba FEZ is an ideal location for investors who trade with mainland continent Africa and beyond. Financial sector is strengthened by political stability of the Zanzibar island, sound regulatory framework, monetary policies plus macroeconomic stability. The Zanzibar island and Tanzania in general is a safe haven for and productive and nonproductive sector as well as.

Multi-sports facility is one of the investment opportunities in Fumba. It features playing surface suitable for a variety of field and court sports including athletics, cricket, football, golf, netball, tennis, volleyball, basketball, gymnastics and more. Benefits of construction of multi-sports facility are increases in economic activity, growth in property value within the surrounding areas, rise tax revenues as well as improved quality of life.

Additionally, the FEZ have set aside investment opportunity for outdoor eating space as is the centuries-long customary for coastal people that has largely been brought about by the warm weather. Also spaces for picnics including spaces for rental outdoor social gatherings are available. After the experience of Covid-19 pandemic, it seems the world now is catching up to outdoor eating practices.

Medical, health and wellness is among the fastest growing in tourism industry around the world. In Sub Saharan Africa there is short supply for the service. Therefore, Fumba FEZ is in perfect location to capture market in Africa. The FEZ has set aside investment opportunity for state-of-the-art facilities for medical, health and wellness tourism.

Investment in higher education is critical because it is the center of knowledge and innovation for aiding the achievement of the SDGs, Agenda 63 and Zanzibar Development Vision 2050. Investment areas for high learning institutions to provide home grown innovation solutions to African challenges, to avoid Africa being dependent on other regions. The private sector should be encouraged to partner with universities on the continent to strengthen the relevance of skills, research and innovation to the labor market.

Cyber city is a special area for business and innovation venture designed to provide high tech office space and data center, incubate startup firms and manage offshore IT ventures. The FEZ has allocated space for cyber city, to enable it become a leader in promoting the IT and BPO (business process outsourcing such as call centers, payroll) industry in Sub-Saharan Africa, as the region competes for a niche market in the $550 billion offshore outsourcing market. Likewise, cyber city neatly links all investment opportunities available in the FEZ not only by providing fast and efficient internet but also by providing international competitive infrastructure, increase efficiency and decrease costs of doing business.

Fumba FEZ has recognized the critical problem of insufficient parking in the Island and has provided ample space for parking. Parking lots have potential to generate substantial hourly/ daily/ weekly/ monthly income with less cost of management and maintenance far less than other forms of property. Electric vehicle parking station are provided for in the proposed parking lots.

Currently, Fumba FEZ accommodates housing estate and apartments developments namely Fumba Town and Uptown Living. This indicates there is available growing market in real estate development. The neighborhood is safe with negligible crime rates. The FEZ proposes important amenities for business, leisure and comfortable living for instance, offices, restaurants, refreshments (coffee/ juice) shops, shopping malls, trails. Fumba FEZ provides easy access to public transportation and a growing job market which is attractive to potential renters or buyers of housing estate and apartments.

The Fumba Free Economic Zone Master Plan 2022- 2042 has proposed the above mentioned investment opportunities and potentials through general and detailed land use plan, for instance sports and recreation, medical, cyber city, offshore financial centre, commercial areas, hotels and beach villas, universities and vocational educational training centers, light processing factories and horticulture areas to provide seedlings for indigenous trees and fruits. The master plan has also provided internal transportation routes, solid and liquid waste management, storm water drainage system, power and water supply designs.

For the Fumba FEZ to attract more investors it requires Government to provide facilitative infrastructure such as road network, power supply (underground electrical cables), water supply, liquid waste disposal and storm water drainage system. In addition, the government should provide incentives such as fiscal incentives e.g. exemption from some export taxes, duties on imports of raw materials or intermediate goods, profit taxes, VAT, free profit repatriation, direct subsidies for instance water, electricity rates. Indirect subsidies like grants for training and education, free provision of physical infrastructure, transport, telecommunication, production space, residential and commercial facilities. Administrative service-fast track customs services, simplified licensing procedures, dedicated legal framework, relaxed regulatory environment, easy foreign ownership procedures, leasing and purchasing land, labor law and environmental regulations and export promotion services in the form of business advisory services, export credit services, sales and marketing support. The ZIPA ought to establish physical boundaries between the FEZ area and the indigenous villages of Nyamanzi, Dimani but more serious is Bweleo and Fumba where there is overlap between village land and land for free economic zone. Last but not least, to curb haphazard development of existing Shehias, encroachment to the free economic zone and land use conflicts, this master plan recommends the preparation of Village Land Use Plan for the 4 Shehia situated within the FEZ.

Table of Contents

List of Map

List of Figures

List of Tables

List of Plates

List of Abbreviations

ASP	Activated sludge process (ASP).
BE	Blue Economy
BoT	Bank of Tanzania
BRT	Bus Rapid Transit
BWEFUM	Bweleo and Fumba
CFTA	Continental Free Trade Economic Agreement
COVID 19	Coronavirus Disease 2019
CPS	Customized Property Solutions
EAC	East African Community
EPZ	Export Processing Zone
EU	European Union
FDI	Foreign Direct Investments
FEZ	Free Economic Zone
FTZ	Free Trade Zone
GCVCs	Global Clothing Value Chains
GDP	Gross Domestic Product
GIS	Geographical Information System
ICSID	International Centre for Settlement of Investment Disputes
ICT	Information & Communication Technology
IP	Internet Protocol
IORA	Indian Ocean Rim Association
LLDC	landlocked Developing Countries
LMIC	Low Middle-Income Country
MICE	Meeting, Incentives, Conferences and Exhibitions
MIGA	Multilateral Investment Guarantee Agency

NAS	Network Attached Storage
PBX	Private Branch Exchange (Telephone Switching System)
PPP	Public Private Partnership
RGoZ	Revolutionary Government of Zanzibar
SADC	Southern African Development Community
SBS	Zanzibar Bureau of Standards
SEZ	Special Economic Zone
SME	Small and Medium Enterprises
SIDS	Small Island Developing States
SMIDA	Small and Medium Industrial Development Agency
SWOT	Strengths, Weaknesses, Opportunities and Threats
TFTA	Tripartite Free Trade Area
UAE	United Arab Emirates
UASB	Upflow anaerobic sludge blanket
ZDV	Zanzibar Development Vision
ZMC	Zanzibar Municipal Council
VAT	Value Added Tax
ZAWA	Zanzibar Water Authority
ZBC	Zanzibar Business Council
ZBS	Zanzibar Bureau of Standards
ZECO	Zanzibar Electricity Company
ZEMA	Environmental Management Authority
ZIPA	Zanzibar Investment and Promotion Authority
ZSGRP	Zanzibar Strategy for Growth and Reduction of Poverty
ZSSF	Zanzibar Social Security Fund

BACKGROUND

CHAPTER ONE

BACKGROUND

1.1 Introduction

Attempt to establish an institution to facilitate, coordinate and promote investments in Zanzibar started in 1986 when the Ministry of Finance and Economic Affairs initiated a department to promote investments in Zanzibar. In 1992, it was converted to government agency called Zanzibar Investment Promotion Agency. As it was not fully autonomous, the investment activities were not executed comprehensively and effectively thus establishing a second institution known as Zanzibar Free Economic Zone Authority with semi-autonomous power operating under the Ministry of State (Planning). This institution could also not perform as expected hence a third.

The question on why separate institutions was addressed by the Investment Policy which was indorsed by the government in 2003. The policy advised on the merge of all three investment related institutions into a single autonomous Authority. The government received the policy recommendation and ZIPA was formed in 2004, under the Zanzibar Investment Promotion and Protection Act, 2004. Currently, ZIPA is operating under the Zanzibar Investment Promotion and Protection Act No. 14 of 2018. The Authority is responsible for investment promotion, facilitation and aftercare services through "One Stop Centre" mechanism. Its Vision is to make Zanzibar an attractive and competitive investment destination regionally and globally.

Currently, ZIPA encourages investments in Five Free Economic Zones in Zanzibar. Four are in Unguja namely Fumba Free Economic Zone (3000 Ha.), Amaan Industrial Park (12.5 Ha.), Maruhubi Free Port and Airport Free Port. Micheweni Free Economic Zone which covers a total area of 808.8 Ha is situated in Pemba.

The land Tenure Act 1992 provides that all land within the island of Zanzibar is public land and shall be administered by the Minister responsible for land affairs on behalf of the President. However, land within the free economic zone which is administered by the Zanzibar Investment and Promotion Authority (ZIPA). The land will be leased to any investor intending to use that land for investment purpose subject to the approval of an investment project by ZIPA.

A Free Economic Zone is a geographic area where goods may be landed, stored, handled, manufactured, or reconfigured, and re-exported under specific customs regulation and generally not subject to customs duty. Free trade zones are a type of special economic zones which can be regarded as an investment in industrial infrastructure and a services provider to attract and facilitate foreign investment, integrate local firms into global value chains, promote export-oriented growth and generate employment.

Free economic zones have emerged on the scene as a planning tool to help boost economic development, including attracting investments in Zanzibar and Tanzania in general. These Free economic zones are economically considered as fundamental strategies deployed by the RGoZ to revamp the economy, following the decline of the clove industry in early 1990s.

Fumba which is a planning area under this assignment, was declared in 1992 as a Free Economic Zone. It covers an area of 3,000 Ha distributed various land uses including residential, commercial, industrial, institutional to mention a few. The RGoZ through ZIPA has reviewed Fumba Master Plan to, among others, address challenges occurring since its establishment and has commissioned the CRM Land Consult (T) Limited to prepare this Master Plan for Fumba Free Economic Zone to accommodate current and future needs related to Investments.

1.2 Objective of the Assignment

The main objective of this consultancy was to review Fumba FEZ Master Pan which was prepared in 1993 by TATA Consultants from India,28 years ago. The review was also included the formulation of new and comprehensive Land Use Master Plan to guide and coordinate future development of Fumba FEZ for the period of 20 years. Specific objectives were:

1) To review of various Zanzibar Developments Programmes, Urban Plans, Strategies, initiatives and visions
2) To establish current status of the land uses at Fumba Free Economic Zone.
3) To conduct sensitization meeting with local community about the project and opportunities in the surrounding villages
4) To analyse site characteristics including climatic conditions, topography, soil types, vegetation and surrounding development
5) To assess internal and external environment of the Fumba FEZ (SWOT Analysis)
6) To map existing buildings, physical and social infrastructures
7) To conduct interviews with professionals at district, regional and ministerial levels
8) To conduct consultative meetings with local (grassroot), district and regional leaders.
9) To assess the spatial growth trend of the Fumba FEZ.
10) To assess socio-economic activities of the island and Fumba in particular
11) To identify potential areas for various investments
12) To apply planning principles that promote mixed use, smart growth, sustainability, efficiency, resilience, integration and inclusivity.
13) To apply spatial development concepts, planning and standards in land use and infrastructure plan so as to organize the future spatial growth of the Fumba FEZ.
14) To prepare land use zoning, detailed plans, schematic design and 3-D of the proposed land use plan
15) To prepare implementation plan and funding mechanisms for the proposed development projects
16) To estimate costs for the proposed development projects

1.3 Need for the Master Plan of the Free Economic Zone at Fumba

Fumba was declared in 1992 as a Free Economic Zone. Despite the commencement of land development at Fumbe, the existing master plan which was prepared in 1993, needs to be reviewed to address the current demand and changes that have been experienced over the decade. It was also observed that the plan is also lacking clear development planning policy, land use planning guidelines, infrastructure development plan, major development projects, development phasing, integration of green structure in proposed land uses, cost estimates for the proposed development projects, implementation plan for the proposed land use including infrastructure and environmental protection measures.

Regardless of the declaration and the presence of the Master Plan, Fumba FEZ has largely developed haphazardly with exception of few pockets where peace-meal planning has been done. Encroachment into Fumba FEZ by various residential and none residential developers has resulted to scattered informal settlements over the free economic zone. The aforementioned development scenario tends to discourage serious investments on the site and results into environmental degradation and land use conflicts.

The recent attempt to update existing Master Pan by ZIPA could not curb informality in land development and facilitate investments at Fumba FEZ. The magnitude of land use changes and emerging new requirements call for the new Master Plan to provide in details the specific use in each land use zones. The envisaged Master Plan will also provide a clear implementation plan with proposed development projects in each land use, source of fund and development phases. This would be possible through wide range of stakeholders' participation in the course of preparation and implementation of the plan.

Of recent, the quest of the Country to embark into Blue-Economy in line with the Industrialization agenda needs to be fulfilled by developing a comprehensive and well informed Free Economic Zone Master Plan that identifies potential areas for investments as well as facilitative infrastructure for both local and direct foreign investments.

It has been also noted that various investors have applied to ZIPA for various investment projects. However, the challenges have been where to locate them and how to guide spatial growth and coordinate all development projects at the FEZ. The master plan is required to guide and coordinate all development projects and make them function in harmony and within common circulation systems. The master plan establishes the common system of storm water management, water supply network, liquid waste disposal and solid waste management facilities that cater wide range of urban activities in the envisaged Fumba Smart City. Development corridors, free pedestrian movement corridors, open spaces and buffer zones for various land uses are required for equitable access to urban amenities and sustainable growth.

It was also observed that previous Fumba Master Plan is not in line with the Zanzibar Master Plan in terms of proposed land use and infrastructure development. Zanzibar Master Plan 2015-2035 provides framework for land use and infrastructure development for local area development plan to comply so that the whole city can function efficiently. Although the flexibility is allowed, the infrastructure that link the whole city like transportation corridors need to be observed while planning for land use at local level. The new master plan will address such aforementioned issues.

Therefore, this Fumba Master Plan (2022-2042) will provide a road map for all future physical development decisions. It will help ZIPA to guide and coordinate development projects pursued by different investors in Fumba FEZ.

1.3 Methodology

1.3.1 Literature review of relevant documents and previous plans

Prior to the preparation of this master plan, it was important to review various literature and documents such as the Zanzibar in Figures (2020), Magharibi B District Profile (2018), Magharibi B Strategic Planning, Zanzibar Population Census (2012), Zanzibar Investment Guide (revised Edition), Land Policy 2018 and Zanzibar Master Plan 2015-2035. Previous plans were reviewed so as to identity the extent to which the proposed land uses were implemented and identify the bottlenecks, issues, challenges and opportunities that this master plan is expected to address and aspects that needed to be taken into consideration (refer Chapter Six). The purpose of the Master Plan or land use plan is to enhance socio-economic growth as well as to facilitate sustainable development (Figure 1.1). Land use is central to many of the environmental and socio-economic issues facing society today. The Fumba Master plan attempts to align land uses with socio-economic growth as well as environmental protection of the natural resources. In other words, planning is about making the connection between buildings, social settings, and their surrounding environments.

Figure 1. 1: Sustainable Development

Review of documents is necessary to collect secondary information for instance, socio-economic data, demography, topography, administrative boundaries and land use tenure.

1.3.2 Reconnaissance survey and field visit

A reconnaissance survey was employed to analyse and map existing land use and vegetation cover of the planning area in order to obtain an overall impression including, land forms, road networks/connectivity, existing Shehia namely Nyamanzi, Dimani, Bweleo and Fumba, partially Shakani and Kombeni as well as their existing facilities, environmental condition and services. Some of the existing land uses include shrubs and temporary crops such as tomatoes. Likewise, field visit offered Consultant a first-hand account of present land use and the complexity of the Fumba FEZ site. Also, within the Fumba FEZ there are organic (natural) villages which have different land tenure from the FEZ hence they are excluded in this land use planning. Boundaries that separates existing organic (natural) villages from the FEZ area are inexact, however this will be discussed in section Chapter Two. Additionally, there is heavy quarrying activities taking place in the area along the coast leading to environmental degradation. Sand quarry is damaging to the flora and fauna, ruins the aesthetics, and frequently causes environmental damage to other coastal ecosystems.

The boundary verification was conducted so as to verify the FEZ border as stated in the Topographical map from the ZIPA and from the Commission for Lands. Verification of the boundary was carried out through a physical visit to the site.

1.3.3 In-depth interviews and Focus Group Discussion

In depth interview were conducted with key informants, both public and private investors. For instance, several interviews with ZIPA Management team to get a knowledge of a brief history of the Free Economic Zones in Zanzibar then Fumba FEZ and ZIPA current expectations their vision, goals as well as desired agendas for the Fumba Master Plan. Other information included list of current investors in Fumba, Fumba FEZ boundary. Similarly, interviews with Sheha (Ward Executive Officers- WEOs) for Nyamanzi, Dimani, Fumba and Bwelea. Also interview with key informants from various Ministries, Departments and Agencies, Magharibi B Municipality. Focus group discussions (FGD) with current investors in Fumba FEZ and in-depth interview with Fumba Town investor (Plate 1.1- 1.5).

Plate 1. 1: : Consultants interview with ZIPA Director for Free Economic Zones

Plate 1. 2: : Consultants interview with Principal Secretary for Economy and Investment at the President's Office- Labour, Economic Affairs and Investment

Plate 1. 3 : Consultants interview with Sheha for Dimani

Plate 1. 4: : Consultative Meetings with current investors in Fumba FEZ

Plate 6. 1: Project Director Presenting hints out an overview of Real Estate Project Project at Fumba Uptown Living (Azam Bakhresa Group)

Plate 1. 5: In-depth interview with CPS CEO Mr. Sebastian and Managing Director Ms Fatma Mussa in the CPS Office, Nyamanzi

Data were also collected from the various Departments, Agencies and Ministries of the Revolutionary Government of Zanzibar (RGoZ) in Unguja. Such data included trends in trading activities, exploitation of natural resources, tourist activities as well as fishing activities. The data were collected in relation to the types, the physical distribution, and the nature as well as access to various community facilities, such as health, education, water, and sanitation. The data collected from the various sectors helped to understand the existing situation in Magharibi B and the Island generally (Table 1.1).

Interviews were conducted with the government utility agencies, namely Zanzibar Electricity Company (ZECO), the Zanzibar Water Authority (ZAWA), and others. Interviews were conducted for the purpose of getting information on the activities and services carried out by the various institutions and their possible influence to the development of the Fumba FEZ and the other way round (Table 1.1). This followed by mapping water points including storage tanks and main distribution network in order to estimate future demand and supply of water but also to conserve groundwater quality and supply.

Table 1. 1: Interviews for Fumba FEZ Data Collection

Methods	Office	Interview conducted with…
Interviews	Zanzibar Investment and Promotional Authority (ZIPA)	Management Team- Head Office
	Ministry of Lands, Housing, Water and Energy	Principal Secretary
		Director for Urban and Rural Planning
		Commission for Lands
	Ministry of Agriculture, Irrigation, Natural Resources and Livestock	Deputy Director- Forestry
		Assistant Programme Officer
	Ministry of Blue Economy and Fisheries	Principal Secretary
	President's Office- Labor, Economic Affairs and Investment	Principal Secretary- Economy and Investment
	Office of Chief Government Statistician	Head- Division of Planning and Budgeting
	Nyamanzi, Bweleo, Dimani and Fumba Shehias	Sheha- Nyamanzi, Bweleo, Dimani and Fumba
	Zanzibar Water Authority (ZAWA)	Officer in Charge-
	Zanzibar Electricity Company (ZECO)	Head- Planning Department
	Zanzibar ICT Infrastructure Agency (ZICTIA)	Officer- Information Management
	Magharibi B Municipality	Municipal Director
		Senior Officer- Planning and Administration
	Zanzibar Environmental Management Authority (ZEMA)	Officer in Charge
	Fumba Uptown Living Limited	Investor- Fumba Free Economic Zone
	Fiber Glass	Investor- Fumba Free Economic Zone
	CPS Live Ltd	Investor- Fumba Free Economic Zone
	Azam Bakhresa Group	Investor- Fumba Free Economic Zone
	CADG Zanzibar	Investor- Fumba Free Economic Zone
	Kihori Co. Limited	Investor- Fumba Free Economic Zone
	S & H Co. Limited	Investor- Fumba Free Economic Zone
	Al-Manara Apartment Limited	Investor- Fumba Free Economic Zone
	Peoples Bank of Zanzibar (PBZ)	Potential investor
	Zanzibar Social security Fund (ZSSF	Potential Investor on Real Estate
Sensitization and awareness creation meetings were conducted at Fumba Project Area with Shehas from Nyamanzi, Dimani, Bweleo and Fumba		
Observation of natural environment.		

1.3.4 Geographical Information System (GIS) and Satellite Images

Geographical Information System (GIS) and Satellite Images is a valuable tool for preparation of base map and updating for Fumba FEZ. There is great deal of information that GIS technologies can produce that are indispensable in any land use mapping and planning assignment. Land use mapping and reporting are technically activities that involve consumption of places in its spatial and temporal dimensions, and for this reason:

(a) Arc GIS was used to analyse data and map various land uses and facilitate spatial data analysis.
(b) Then the Consultant undertook map analysis of Satellite images over the past 10-20 years to measure the trend and pattern of land use change in the Fumba FEZ.
(c) The trend and pattern of land use changes over time informed the Consultant to suggest sustainable land use management activities suitable for the Zone.
(d) GIS also provided data and information in developing participatory land use plans in the Zone.

1.3.5 Stakeholder meetings

Land use planning is not done in isolation; in fact, a good land use plan is participatory. Both consultative and dissemination workshops were engaged as a useful tool that allows the Consultant team and the Client team to collaborate and inform as well as guide the planning project. Stakeholder meetings helps mitigate potential conflicts, including uncertainty and dissatisfaction.

1.3.6 Data Processing and Synthesis

Different information was collected from various sources (Table 1.1) and analysed individually for instance economy, housing, infrastructure and demography data was collected and projected for the next 20 years, that is 2022- 2042. Demography data allows the Consultant to combine it with available land to propose future needs for the said population. Needs include infrastructure and social facilities like roads, water use, power, solid waste management, health and education and future land requirements for proposed infrastructure and social facilities.

Discussions were made by the planning team oon varius aspects of land use where various thematic maps were prepared to demonstrate existing situation and proposed land use and infrastructure plans (Plate 6.2).

Plate 6. 2: Planning Team discussing various aspects of existing situation, issues and interventions

1.3.5 Presentation of the Draft Fumba FEZ Master Plan for comments and acceptance

Fumba FEZ Master Plan report was presented to a meeting that included multiple stakeholders This method allowed Consultant to efficiently engage multiple stakeholders simultaneously and have a structured, yet organic, conversation. This meeting was meant to promote alignment and engagement. Beyond disseminating the information that is included in the Master Plan, the meeting improved clarity and context, and for stakeholders to understand more on their roles and responsibility as well as the roles and responsibility of the Client and the public in general, how each one is important for the success of the plan. The Consultant is obligated to provide development conditions on each and every land use provided in the Fumba FEZ Master Plan which encourages sustainable growth.

1.4 Fumba Free Economic Zone as an integral part of Zanzibar Development

Implementation of Fumba Free Economic Zone Master Plan 2022-2042 will open up new avenue for economic growth of Zanzibar. It will create additional competitive advantages of economic growth following the proposed development of infrastructural facilities, tourists hotels, recreational facilities, medical city, international conference facilities, real estate development and ICT park. Fumba Free Economic Zone opens up for local and international investors. The Master Plan has designated potential areas for investments and considers the catchment area for Fumba Free Economic Zone at regional and global scale.

Fumba FEZ is connected to Pemba, Tanzania Mainland and the rest of Africa and the World at large through the airport and the harbour. Figure 1.2 illustrates distance from Unguja island to local and international destinations. Additional facilities that Unguja and Dar es Salaam can provide to Fumba FEZ include access to international airports and port facilities

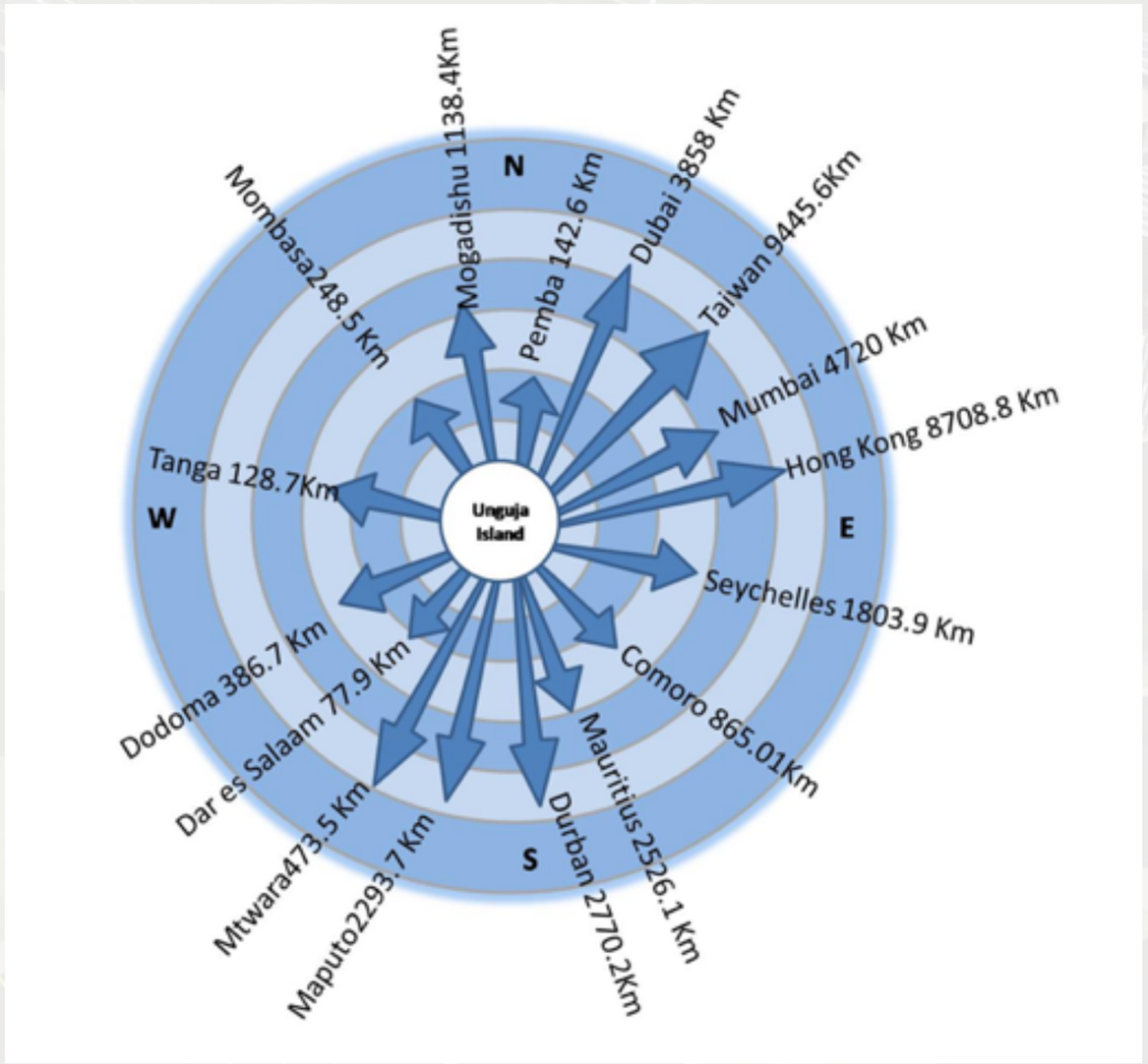


Figure 1. 2: Local and International Destinations and the estimated distances

Zanzibar has outstanding trade history, comparative advantages and tourism potentials. It is one of the tourist destinations in the world, consists of two main Islands, Unguja and Pemba, and several other smaller islands some of which are not inhabited. It is located in the Indian Ocean, about 30 kilometers off the East Coast of Africa between latitude 5 and 7 degrees south of the equator. The total area of Zanzibar is 2,654 sq km (Unguja 1,666 sq km and Pemba 988 sq km). Zanzibar United with the former Tanganyika in 1964 to form the United Republic of Tanzania, which is governed in a way that Zanzibar has full autonomy in the constitutionally non-Union matters

like Finance and Economy. Based on 2002 National Population Census, Zanzibar is the most densely populated part of the United Republic of Tanzania with 370 people per sq. km. and an annual growth rate of 3.1 percent.

Before the development of eastern African mainland ports, Zanzibar was the trade focus of the region for millennia. The location of Zanzibar on the trade routes made it accessible to both traders and colonists from Arabia, South Asia, and the African mainland. Currently, it has become an ideal for companies who need to do business with many countries in mainland Africa and beyond. Being part of the United Republic of Tanzania, it has market potential with immediate estimated population of 55 million, but with its historical and strategic location, its catchment area goes beyond African Continent to Middle East, Asia and Europe. As such Zanzibar has the potential to re-emerge as an economic, tourist and social hub of the eastern region of Africa.

It is worth noting that Zanzibar is stable politically, socially and economically making it potential for local and foreign investments. Being part of United Republic of Tanzania, Zanzibar benefits with membership of Multilateral Investment Guarantee Agency (MIGA) of the World Bank, the East African Community (EAC), the Southern African Development Community (SADC), and the Indian Ocean Rim Association (IORA). It also form integral part of the Tripartite Free Trade Area (TFTA) agreement between COMESA, SADC, and the East African Community (EAC), as well as the Continental Free Trade Economic Agreement (CFTA). Also, Tanzania is a signatory to the Convention of Recognition and Enforcement Arbitration Award, and a member of International Centre for Settlement of Investment Disputes (ICSID). As a result, it can benefit from ongoing regional integration initiatives by facilitating the movement of locally produced goods.

The Revolutionary Government of Zanzibar (RGoZ) has long recognized the role of private sector in economic development of the country. The excellent response from several private investments within Zanzibar and from abroad is adequate evidence that investors have strong confidence in the political will of the Government.

The island has well-articulated planning systems focusing on national, regional and local plans and has set a 2050 Zanzibar Development Vision (ZDV). The 2050 ZDV is to transform Zanzibar into a middle income country and eradicate absolute poverty in the society by building a strong and competitive economy so as to achieve high-quality livelihoods for citizens also improve good governance and the rule of law without compromising Zanzibar's rich culture (RGoZ, 2020). The 2050 Zanzibar Development Vision (ZDV) has prioritized Blue Economy and Deep Sea Fishing that is also in line with Agenda 2063 and Sustainable Development Goals (SDGs), which ambitiously aimed at ending poverty by 2030. Achievement of ZDV 2050 to a large extent requires economic policies that are aimed at creating education, training and employment opportunities; providing basic social services; and encouraging participatory development. The Free Economic Zone Planning is aimed at addressing the aforementioned issues.

1.5 Evolution of existing land use and spatial development patterns

Zanzibar is a historical town traced way back in 1503, ruled by colonial administration for about 460 years. The Portuguese administration ruled Zanzibar for about 200 years while Arabs under Oman Kingdom occupied the Island between 1698 and 1964. The Zanzibar attained her independence in 1964.

Zanzibar Town's current spatial structure is based on its historical development over the centuries compounded by the high demand for housing during the last decades resulting in large informal developments along the primary access routes to town, accompanied by commercial development along main roads. Historically, the Zanzibar Town include Stone Town and "Mjini Magharibi. This area was connected by 4 main roads to the north (Bububu), north-east (Chwaka), south-east (Fuoni) and south (Fumba and the airport). As seen in Figure 1.1 which includes six maps, it indicates that for more than a century, Stone Town, and later Zanzibar Town, developed close to its historic core, within walking distance of it and creating semi-radial rings around it. Together with the massive growth of population, since the 1990's, the pattern changed and development occurred along main roads and public transport corridors. After the approval of the Chinese Plan in 1982 major development occurred to the east of town and later on moved further to the east and to the northern sections of the city. Zanzibar has been growing consistently and Zanzibar Town in particular has been growing rapidly over the past century, from some 35,000 in 1923 to over 600,000 in the town today:

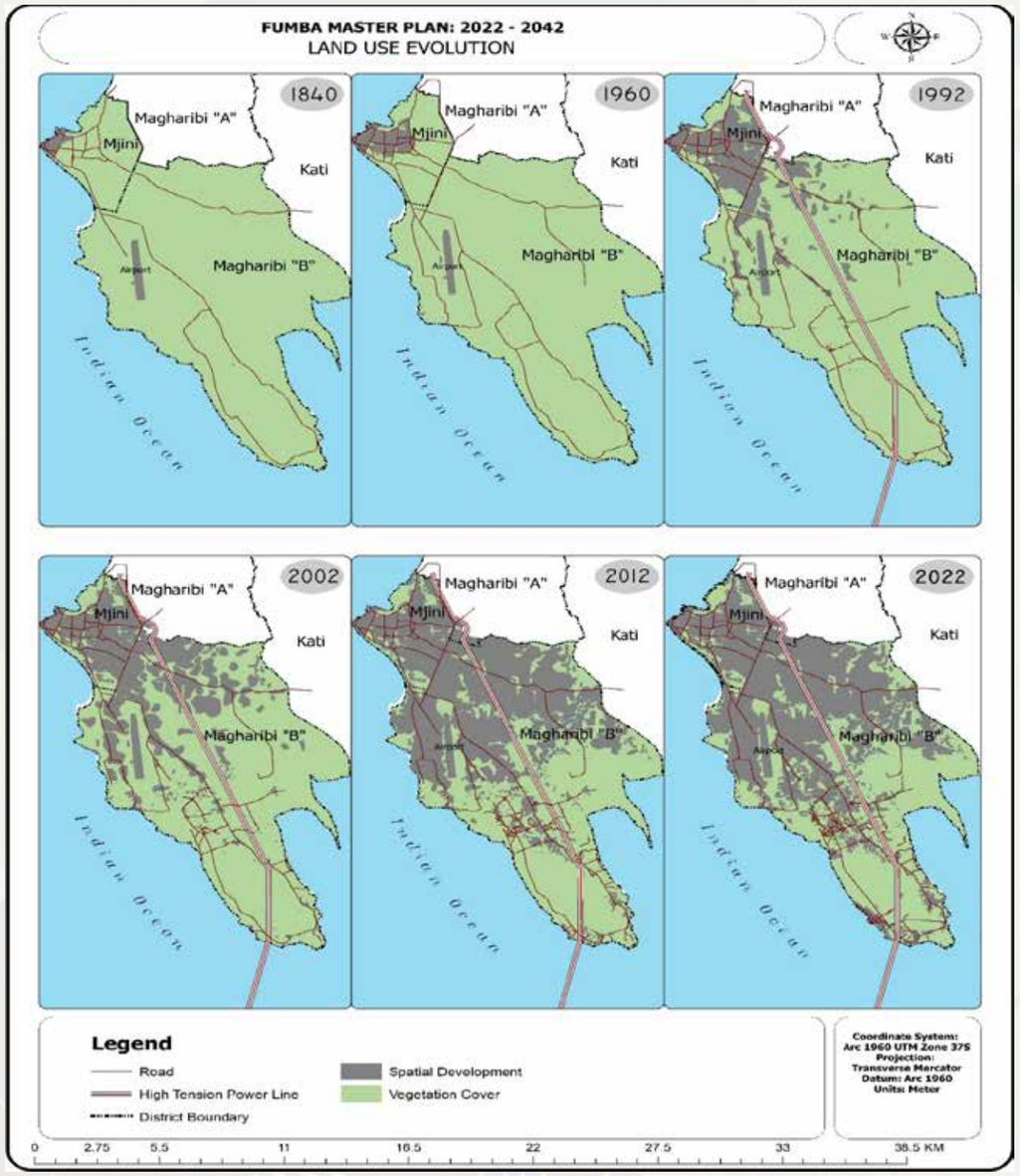


Figure 1. 3: Land Use Evolution 1940 – 2022

Whilst growth until independence in 1964 was relatively moderate as illustrated in figure 1.1, the growth increased tremendously in the postindolence. However, the remarkable spatial growth was observed since 1990s to date. There has been a major shift in population in Zanzibar Town itself over the past decades. Until the 1980's the urban population was concentrated in the ZMC. From there on population growth spilt-over into the West District with the majority of the City's population, over 60% currently residing in the West District calling for service improvements and expansion of infrastructural facilities such as water supply, power supply, solid waste collection facilities and storm water drainage system.

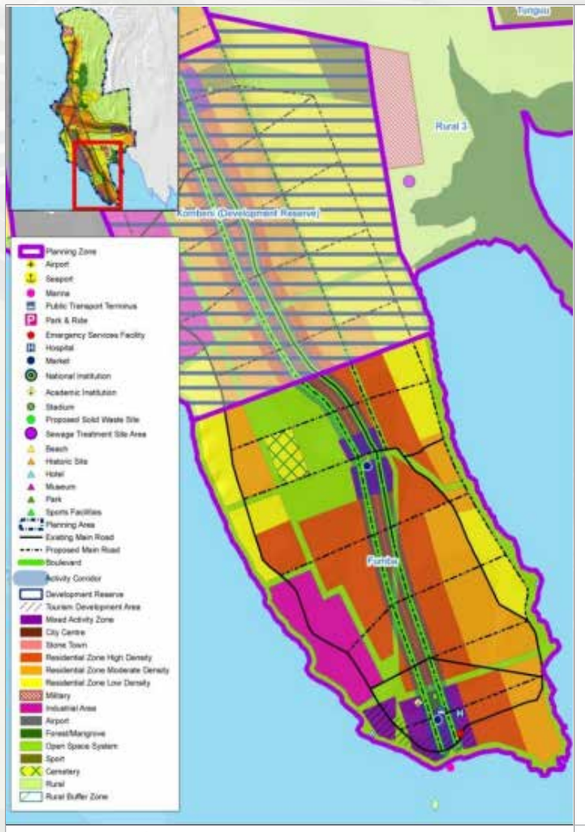
Fumba Free Economic Zone being situated in Magharibi B District with its envisaged future mart city development, has started to experience rapid population growth. It will further skew population to the West District extrapolating current development scenario.

1.6 Review of Previous Master Plan, Legal and Policy Framework

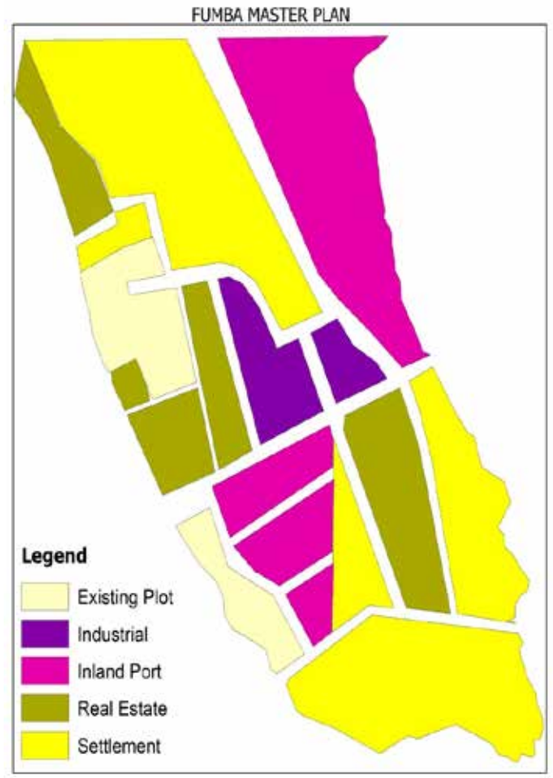
1.6.1 Previous Fumba Free Economic Zone Master Plan

The purpose of a Master Plan is to promote growth and guide, coordinate and regulate present and future development of towns and cities with a perspective of 20-25 years. Major component of this consultancy assignment is to review previous master plan for Fumba Free Economic Zone and recommend the way forward. It is also underscored that the effective land use plans are flexible, living guidelines and policies, self-correcting and able to adapt to changing times.

As an essential tool, planning is responsibility of any accountable management and ought to be be undertaken or updated whenever needed. Since Fumba was established as a free economic zone in 1992, two (2) master plans have been prepared. In 1993, TATA Consultancy firm from India prepared a Master Plan for Fumba Free Economic Zone which expired in 2013 hence there is a time lag of 8 years. As the plan was not alive, massive and undesirable developments have taken place over the past decade. Again in 2015, Zanzibar Master Plan 2015-2035 popularly known as Zan Plan was prepared as part of the National spatial land use plan and it included Fumba FEZ. However, ZanPlan did not capture some of the components that ought to be in the Free Economic Zone. In addition, the planned new centre and transport node at Fumba could not cover the whole Free Economic Zone as declared i.e 3000 Ha. The Fumba was considered as New Urban Centre and Transport Node for BRT by Zan Plan while such proposed land use was not in line with the Fumba Free economic Zone Master Plan as shown in Figure 1.2.



Planning zone for Fumba as per ZanPlan 2015-2035



Planning zones for Fumba Free Economic Zone as per Fumba FEZ Master Plan 1993-2013, revised 2015

Figure 1. 4: Proposed planning zones for Fumba as per ZanPlan and Previous Fumba FEZ Master Plan

The previous Fumba FEZ Master Plan proposed area for Industrial Development at Fumba which overlap with the Main Transportation Corridor for BRT and other public buses. In addition, industrial development at Fumba Free Economic Zone is currently restricted. Such restriction should be take into account by the new master plan for Fumba Free Economic Zone which is envisaged to guide and coordinate spatial development of FEZ for the period between 2022 and 2042.

1.6.2 Policy and Legal Framework

This Section identifies the policy and legal framework that could govern the preparation of Fumba FEZ Master Plan. The main components considered in the planning framework are the policies and legislations that underpin planning for the free economic zones.

Zanzibar Investment Policy

The Zanzibar Investment Policy (ZIP) is the main policy that governs development of FEZs in Zanzibar. The policy objective intend to transform Zanzibar economy to a more diversified and semi industrialized economy with emphasis on agro and marine product processing. It also intends to promote small and medium enterprises that serve both the domestic and export markets as well as to identify and promote micro enterprises that have potential for output expansion, employment generation and export.

The investment policy provides specific policy strategies for Export Processing Zones and Free Economic Zones that among others includes:

(i) To identify industries that instrumental in job creation and transfer of technology,
(ii) To promote local resources-based investments with backward linkages,
(iii) To promote Investment in exports manufacturing, assembly, processing and recycling,
(iv) To promote service-based investments that has positive impacts on site preparation and development of FEZs, and
(v) To ensure development of essential infrastructure in all EPZ/FEZ sites so-as-to increase industrial estate capacity and balance their locations.

Zanzibar Investment Promotion and Protection Act, 2018

Zanzibar Investment Promotion and Protection Act, 2018 defines the designated FEZs that includes Fumba FEZ in Magharibi B District in Unguja. According the aforementioned legislation, the Zanzibar Investment Promotion Authority is responsible for administration, control and management of the FEZs and thus.

(i) Draw up the development plans, such as Master Plans, of the FEZs and organize their implementation.
(ii) Examine and approve enterprises (type of industrial firms) and investment projects to be attracted in the FEZ.
(iii) Handle land allotment for industrial and commercial enterprises in the FEZs.
(iv) Coordinate working relations among the banking, insurance, taxation, customs, frontier inspection, postal and telecommunication and other organizations in the FEZs.
(v) Ensure orderly development of the FEZ.
(vi) Determine entry of personnel into the FEZs.

The Act explains the purpose of the FEZ as to provide investors with a wide scope of operation create favorable operating conditions and guarantee stable business sites. The Act also provides a room for investors to establish with their own investment or in joint ventures with the Government all projects that have positive significance for international economic cooperation and technical exchanges including industry and manufacture involving high technology and business of common interest to investors and the Government.

Zanzibar Micro, Small and Medium Industrial Development Agency Act, 2018

The Act provides for the category of industries in terms of size. These industries that may be attracted into the FEZ include:

(i) Micro Industries: These are industries or enterprises that has a total value not more than TZS 11,000,000/= or has employments not more than 4 employees
(ii) Small Industries: These are industries or enterprises that has a total value between, TZS 11,000,000/= and TZS 57,000,000/= or has employments between 5 and 19 employees
(iii) Medium Industries: These are industries or enterprises that has a total value between TZS 57,000,000/= and TZS 650,000,000/= or has employments between 20 and 99 employees.

In the establishment of these categories of industries, the Micro, Small and Medium Industrial Development Agency (SMIDA) shall be responsible, among others, to:

i) Promote the creation and development of micro, small and medium industries,
ii) Establish, coordinate or facilitate affordable credit schemes and other financial and non-financial services for micro, small and medium enterprises,
iii) Coordinate and contribute in carrying out market research in goods manufactured and services provided by micro, small and medium industries,
iv) Facilitate development of micro, small and medium industries through encouragement of utilization of locally available knowledge, skills and resources,
v) Provide technical assistance to persons engaged in micro, small and medium industries,
vi) Provide and promote training facilities for persons engaged in employment or to be employed in micro, small and medium industries,
vii) Improve the standard and quality of the products through technology development and transfer, packaging, innovation and technical services, and
viii) Facilitate national, Regional and international market access for micro, small and medium industrial products and services.

The Clove Development Act, 2014

For the establishment of the agro-processing industries that are related to clove, and for the purpose of ensuring steady supply of raw materials for clove related industries, the Act has provided for the establishment of the Clove Development Funds. The uses of fund, among others, include:

- Support and promote improvement and expansion of cloves cultivation, plantation, production, experiments and investigation in connection with clove development,
- Provide financial assistance for the promotion of clove farmers for the purposes of raising productivity, extension services support, and sustainably raising the volume of produced quality cloves and allied products that includes leaves and any part of the clove trees and products related to or originating from clove trees,
- Support any infrastructure development projects in clove plantation areas, and
- Support branding activities and other marketing information systems.

Fisheries Act, 2010

For the establishment of the agro-processing industries that are related to fishing, and for the purpose of ensuring steady supply of raw materials for fish related industries, the Act has provided for establishment of the Department of Fisheries. The functions of the department, among others, include to:

(i) Promote, develop, control and monitor the purpose of proper management of all fisheries and related activities in artisanal and semi industries,
(ii) Encourage sustainable use of marine resources, quality control, value addition and marketing.
(iii) Administer fisheries activities and all marine products from related industries, and
(iv) Carry out scientific research or other activities for proper management of fisheries related industry.

Public Private Partnership Act, 2015

The Public Private Partnership Act, 2015 provides for partnership between the Government and a Private Partner to deliver infrastructure and services that are required in development of the FEZs. The scope and form of partnership may include any or combination of the following:

(i) The design, construction, financing, maintenance and operation of new public infrastructure project.
(ii) The rehabilitation, modernization, financing, expansion, maintenance and operation of existing public infrastructure, and
(iii) The administration, management, operation, maintenance or other services pertaining to public services or new or existing public infrastructure.
(iv) To facilitate this partnership, the Public Private Partnership Department was established within the Zanzibar Planning Commission. This department is the coordinating entity responsible for ensuring that all PPP projects implemented in Zanzibar conform with the Government objectives and that all proper procedures are followed and approvals are obtained during development and implementation of each project up to signing of the agreement.

Some of the PPP projects as listed in the Schedule that are relevant in the development of the FEZ includes:

(i) Water supply, including production, management, cleaning and distribution, sewerage and drainage,
(ii) Generation, transmission and distribution of all types of energy,
(iii) Public roads, highways, expressways, bridges, tunnels and their engineering structures and
(iv) Airport, terminals and related aviation facilities.
(i) Port development including terminals, piers, handling, storage, freeport infrastructure and other related facilities and services.
(ii) Environmental and solid waste management projects including composting plants, collection facilities, incineration, landfill, recycling and other municipal and rural services.
(iii) Development of industrial zones, information and other export zones.
(iv) Housing scheme project, public shelter and social work.

Vocational Training Act, 2006

Vocational training is necessary for providing education or training outside the regular education system for empowering trainee (Fumba residents, for example) to secure either employment in the employment market, such as in the FEZ, self-employment, or to go back in the regular education system. The Act therefore, provides for establishment of the Vocational Training Centers owned by the Government, Non-Governmental Organization, or private individual person.

The Act also provides for the establishment of the Vocational Training Authority for the purpose of supervising vocational training by determining the standards of training, assessing/evaluating the vocational training centres, registering the centres and assessing/evaluating and approving the capacity and skills of trainers and trainees.

Furthermore, the Vocational Training Authority is responsible for coordination of vocational training by conducting research of the employment market, preparing scheme (curriculum, syllabus of long-term course and short course), dealing with the vocation training, enhancing develop capacity and skills of the trainers and leaders of the vocational training; provide vocational training and to confirm all certificates issued by registered vocational centres.

Disasters Management Act 2003

Disaster means any occurrence of a natural or a man-made event causing a catastrophic situation whereby the day-to-day patterns of life are widely and suddenly disrupted and people are plunged into helplessness and suffering and as a result need to be provided with protection, food, clothing, shelter, medical and social care and other necessities of life. Man-made disaster, among others, includes industrial accidents, fire break out. Disaster preventions is, therefore, necessary to be taken into account in the design of the FEZ Master Plan. There is also Zanzibar Disaster Risk Reduction and Management Act 2015.

The Act also provides for establishment of the Disaster Co-ordination Commission that is responsible for, among others to:

(i) Coordinate all disaster relief operations and preparedness measures. Disaster preparedness means the state of being able to anticipate a disaster and undertake timely measure designed to minimize the loss of life, property and environment and to organize and facilitate effective emergency relief operations in time of disaster, and
(ii) Solicit resources from inside and outside the country which can assist in various activities for relief co-ordination and disaster prevention. Disaster prevention means any measure designed to prevent natural phenomenon from causing ore resulting in a disaster.

Zanzibar Standards Act, 2011

To ensure quality commodities produced or manufactured, rendered within, or imported into Zanzibar, the Zanzibar Standards Act of 2011 established the government agency known as the Zanzibar Bureau of Standards (ZBS). Thus, through ZBS, all commodities produced in and out of the FEZ are expected to be of high quality. The functions of the ZBS, among others, includes to:

(i) Establish, publish, promote, amend or modify from time to time an updated version of a standard for the quality, quantities and units of measurement to be used, which shall be in conformity with the latest version of the international system of units,
(ii) Undertake measures for quality control, quality assurance and certification of commodities, services and environment of all descriptions and to promote standardization in industry and trade,
(iii) Provide for the inspection, sampling and testing of locally produced, manufactured, agricultural and imported commodities with a view to deter whether the commodities comply with the provisions of this Act or any other law dealing with standards relevant to those commodities, and
(iv) Make such inspection and take such samples of any material or substance as may be necessary to see whether any article or process in relation to which the Standard Mark has been used conforms to the National Standard or whether the Standard Mark has been improperly used in relation to any article or process with or without a license.

Zanzibar Trading Act, 2013

For marketing of the commodities produced in the FEZ, the Zanzibar Trading Act of 2013 makes provisions for the establishment of the Department of Trade that is responsible for the administration and supervision of trade and trading in Zanzibar. The functions of the Department of Trade, among others, includes to:

(i) Promote domestic, Regional and international market,
(ii) Seek and provide business information service related to sale and purchase of consumer goods and other commodities and advise the Government, business community as well as individual businessmen,
(iii) Administer domestic, Regional and international trade and to provide educational and other awareness services necessary for promoting trade,
(iv) Provide mechanism conducive for establishment of public private partnership especially in planning, execution and administration of agro processing initiatives for agricultural products, and
(v) Promote business enterprises including small and medium enterprise and assist in developing and expanding profitability in the domestic, Regional and international trade transactions.

Land Tenure (Amendment) Act, 2010

The issue of land tenure is crucial especially for investment purpose, such as commercial and institutional which are long term investments. To ensure security in investment in the Fumba FEZ, the Act provides power to the Minister to lease land to any person, Zanzibar or non-Zanzibar for investment purposes after approval by ZIPA. Also, the Act explains that the lease of land after being developed according to ZIPA approved investment plan, may be sold, assigned, sub leased or sub divided, inherited or mortgaged, provided that the lessee shall not make any disposition without approval by the Land Transfer Board.

Furthermore, the Act provides that the land holder, before the lease to an investor, should be paid compensation based on a fair market value of the land and improvements on the land. With this provision, land holders within the Fumba FEZ should be paid compensation before land allocation to the investors.

The Land Transfer (Amendment) Act, 2007

As the case of land tenure security, land transfer is also an important aspect for investment purposes such as industries that are long term investments. The Act provides that the permanent transfer of land or long-term lease should take place after review and approval of the transaction by the Land Transfer Board. This provision provides flexibility and attraction of investors in the Fumba FEZ.

Zanzibar Environmental Management Act, 2015

Protection of the environment in the FEZ is a critical aspect. The Zanzibar Environmental Management Act, 2015 provides the general environmental obligation that every person is obliged to protect the environment for the welfare of present and future generation. It provided further that every person should ensure that development plans and activities are implemented in environmentally sound and sustainable manner. Furthermore, the Act provides for the establishment of the Environmental Advisory Committee. The function of this committee, among others, include:

(i) To advise on implementation of policy, strategy and environmental management plan,
(ii) To mediate and resolve any disputes between government institution, private institutions or society on matters pertaining to environment

Public and Environmental Health Act, 2012

Land and environment pollution are among the negative effects from the industrial developments and vehicular traffic in any part of the world, including the FEZs. This Act was, therefore, prepared for the purpose of protection of residents of Zanzibar from infections and or disease propagation.

With respect to waste management, the Act provides that the Director General of Health shall protect the public by prescribing the optimum biological and chemical standards for solid waste, liquid waste, medical waste and emission management before being discharged or disposed to the environment. With respect to dumping site, treatment plant or transfer station, that are also required in the FEZs, they should be located in safe environment in consultation with the department responsible for environment. Prior to the establishment of these sites, the following should be done:

(i) Carry out or cause to be carried out an Environmental Health Impact Assessment as provided by the Zanzibar Environmental Management for Sustainable Development Act of 1996,
(ii) Ensure that the designated area is adequate in terms of size and is situated away from residential area and
(iii) Ensure the designated area is fenced off, placed with warning signs and secured to prevent unauthorized persons from entering.

Furthermore, the Act provides for the management of the infectious wastes, hazardous wastes, medical wastes, veterinary wastes, chemical wastes as well as gaseous wastes that might also be produced in the FEZ.

Blue Economy Policy 2020

The blue economy concept was formally coined during the “Rio+20” United Nations Conference on Sustainable Development held in Rio de Janeiro, 2012. The “Rio+20” conference advocates blue economy (BE) as a new economic frontier for coastal states, and more importantly for Small Island Developing States (SIDS), with which Zanzibar shares common characteristics. The RGoZ believes that if Zanzibar can adequately implement BE, it will enhance economic growth, increase incomes and help protect the environment. However, realizing the full potential of BE calls for the inclusion and participation of all related social groups and sectors through appropriate legal and institutional frameworks. RGoZ through her Blue Economy Policy specifically seeks to:

(i) promote and improve sustainable economic inclusion within the BE priority areas and communities
(ii) strengthen coordination between multiple economic sectors within the BE framework;
(iii) improve food and nutritional security through the sustainable management of blue resources;
(iv) empower local communities, especially women and youth involved in BE activities
(v) ensure the safety and security of Tanzania’s maritime domain in coordination with the national maritime security agencies; and
(vi) enhance financing and revenue collection through sustainable BE activities

In this regard, the Fumba Free Economic Zone Master Plan will be consistent with blue economy policy direction of RGZ as will coordinate different economic sectors increasingly important as a means of strengthening linkages between the primary, secondary and tertiary sectors of the economy as discussed here under. Additionally, the implementation will involve the effective and sustainable coordinated management of Zanzibar's natural and human resources, both in the marine environment and on land, thereby representing a considerable share of the country's GDP. We have identified the following sectors which we expect will develop or be enhanced following the FTZ.

1.7 Organization of the Report

This report is organized into eight Chapters. Introductory part is presented in Chapter One. Chapter Two deals with site characteristics and demographic issues. The site characteristics cover topography, vegetation distribution, accessibility, connectivity and population distribution. Chapter Three focuses on Economic Analysis of Zanzibar in general, highlighting key sectors which drive Zanzibar economy. Chapter Four is dedicated for existing Infrastructure including water supply, liquid waste management, solid waste disposal, storm water drainage, power supply and ICT facilities. While Chapter Five presents Existing Land Use at Fumba Free Economic Zone, Chapter Six provides planning issues, projections in terms of population and space use requirement for the proposed investments and SWOT analysis and Projections. Chapter Seven presents Spatial Development Concepts and Planning Proposals. The last Chapter provides Implementation Plan and Cost Estimates for the proposed development projects.

SITE CHARACTERISTICS, DEMOGRAPHY AND COMMUNITY FACILITIES

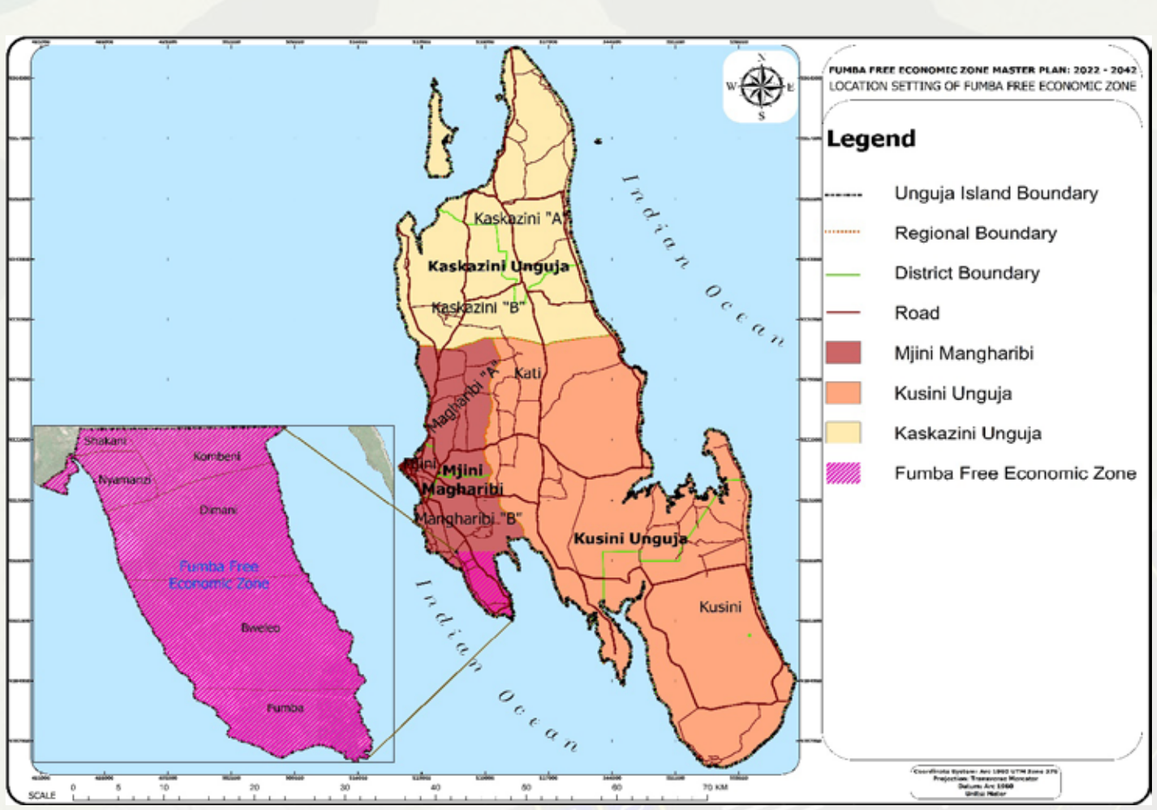
CHAPTER TWO

SITE CHARACTERISTICS, DEMOGRAPHY AND COMMUNITY FACILITIES

2.1: Location and Accessibility

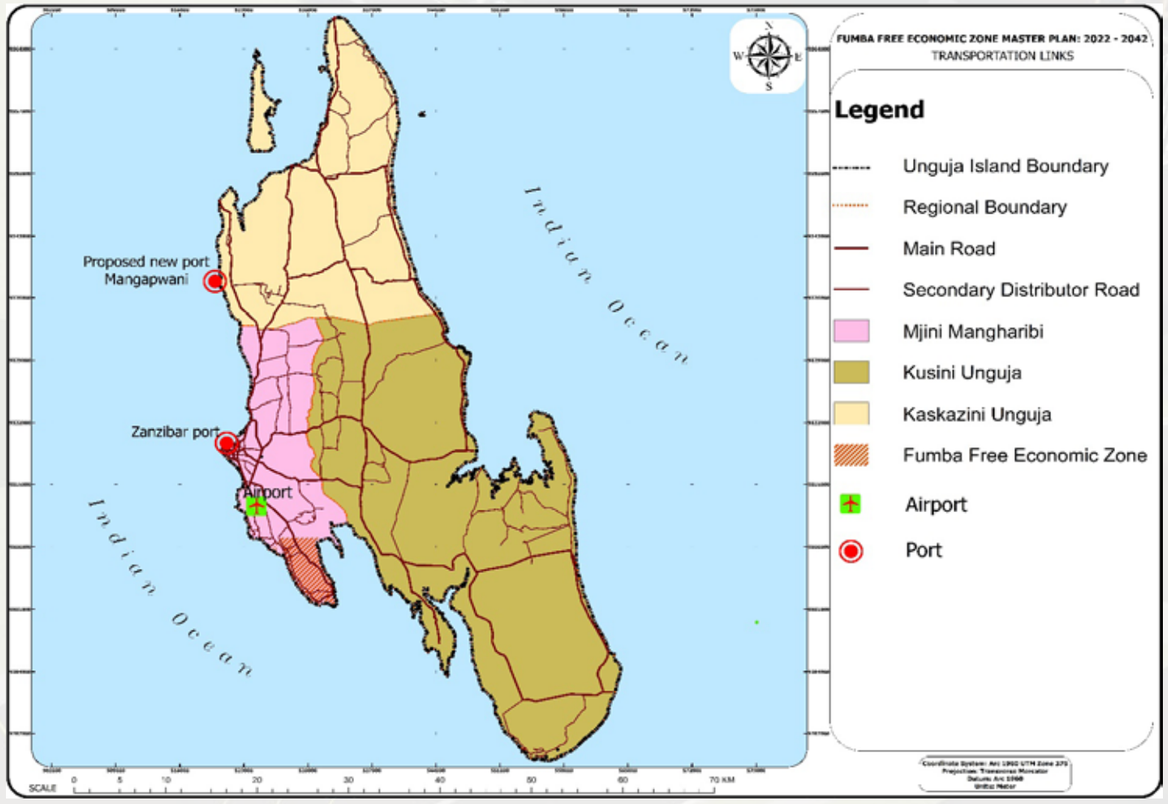
Fumba Free Economic Zone is situated in Maungani Ward which is one of the two administrative wards comprising Dimani Constituency in Magharibi B District. Fumba Free Economic Zone hosts six shehia namely Fumba, Bweleo, Dimani, Nyamanzi, part of Kombeni and part of Maungani. Map 2.1 shows the locational aspects of Fumba Free Economic Zone.

Map 2. 1: Location of Fumba Free Economic Zone



Fumba Free Economic Zone is highly accessible. It is connected to Airport Road to the north-east and also accessible through marine transport facilities.

Map 2. 2: Transportation link to Free Economic Zone at Fumba



2.2 Climatic Conditions

2.2.1 Temperature

Temperature consideration is one of key aspect in urban design as it influence size, height, building material and orientations of buildings. In Fumba Free Economic Zone and Zanzibar at large, the temperature is generally high

throughout the year. The warmest period is from December to March, during which the maximum temperature reaches 33 degrees Celsius (91 °F) and the humidity is high, although breeze slightly lowers down temperature. In the worst moments, the temperature can reach as high as 36 and 38 °C which stands at 97 and 100 °F respectively. The period from May to August, when the trade winds predominate, blowing moderate from the southeast, is cooler, with highs around 29/30 °C (84/86°F). Table 2.1 shows average temperatures in Zanzibar.

Table 2. 1: Temperature (January to December)

Month	Min (⁰C)	Max (⁰C)	Mean (⁰C)	Min (⁰F)	Max(⁰F)	Mean(⁰F)
January	25	33	28.8	76	91	83.5
February	25	33	28.8	76	92	84.0
March	25	31	28.8	77	91	84.0
April	25	31	27.8	76	88	82.0
May	24	30	26.9	75	86	80.5
June	23	29	26.3	74	85	79.5
July	22	29	25.7	72	84	78.0
August	22	30	25.6	71	85	78.0
September	21	30	25.9	70	87	78.5
October	22	31	26.8	72	88	80.0
November	24	31	27.2	74	88	81.0
December	24	32	28.2	76	90	83.0
Ann. average	**23.4**	**31**	**27.15**	**74.2**	**87.7**	**81.0**

2.2.2 Rainfall

The climate of Zanzibar is tropical, hot all year round as described above, with two rainy seasons namely one more intense, known as the “long rains” season, from March to May, with the peak in April, and the other less intense, known as the “short rains” season, between mid-October and December. Total annual rainfall is about 1,600 millimeters (63 inches) in Unguja and 1,900 mm (75 in) in Pemba. April and May are the wettest months, when downpours can be really strong and cause floods. However, some short thunderstorms can occur throughout the year. Table 2.2 shows the average precipitation in Zanzibar.

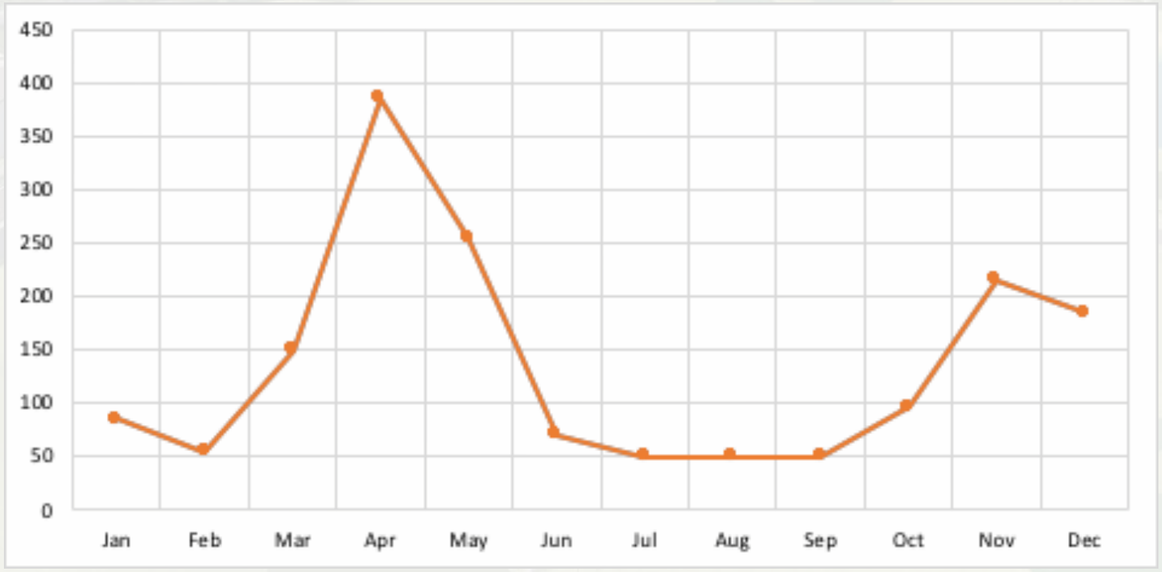


Figure 2. 2: Rainfall

2.2.3 Humidity

The humidity comfort level is based on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night. The perceived humidity level in Zanzibar, as measured by the percentage of time in which the humidity comfort level does not vary significantly over the course of the year, staying within 4% of 96% throughout.

2.2.4 Wind

The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages. The average hourly wind speed in Zanzibar is rapidly increasing during the fall, increasing from 9.5 miles per hour to 13.4 miles per hour over the course of the season. For reference, on July 4, the windiest day of the year, the daily average wind speed is 14.3 miles per hour, while on March 25, the calmest day of the year, the daily average wind speed is 8.0 miles per hour. The lowest daily average wind speed during the fall is 8.0 miles per hour on March 25.

2.2.5 Sunshine

The amount of sunshine in Zanzibar is good enough all year round, except in the long rains season, from March to May, where cloudiness can last a little longer. The best months to enjoy the sun and the sea of Zanzibar are July, August and September. In Zanzibar, the rains cease or drastically decrease in June.

Table 2. 2: Sunshine hours

Month	Average no. hours per day	Total hours per year
January	9	275
February	9	250
March	7.5	230
April	6	185
May	6.5	210
June	8	240
July	8	250
August	8	250
September	8.5	255
October	9	275
November	8.5	250
December	8.5	260

Consideration of sunshine hours in the course of preparing the Fumba Free Economic Zone Master Plan is imperative in an assessment for solar power harnessing. In Fumba Free Economic Zone investors in solar farm are assured of reliable source of solar power.

2.3 Vegetation

Vegetation in the area is characterized by shrubs and some fruit trees such coconut, banana and mango trees largely found in existing traditional villages popularly known here as Shehias. The sparsely distribute vegetation is caused by clearance of some areas for housing and farming activities (Plate 2.2). Also large rock outcrop and surface stoniness; do not allow well establishment of vegetation under natural conditions. The establishment of vegetation which is very important to cool down the environment, create livable and comfortable environment as well as maintaining ecological system will require special treatment.

Plate 2. 1: Rock outcrop limiting natural establishment of vegetation

Plate 2. 2: Site clearance for housing development leading to disappearance of natural vegetation

However, thick and natural vegetation dominated by shrubs and grasses was identified in some areas of Fumba Free Economic Zone. Through interviews with local people, it was revealed that the persistent of dry period causes disappearance of natural vegetation which reappear during the rain seasons. This situation suggests that it is quite possible to vegetate land in Free Economic Zone provided that rainy water is harvested and stored for use during dry period. On the other hand, recycling of liquid waste is necessary as source of water for vegetation establishment in the envisaged new Fumba city.

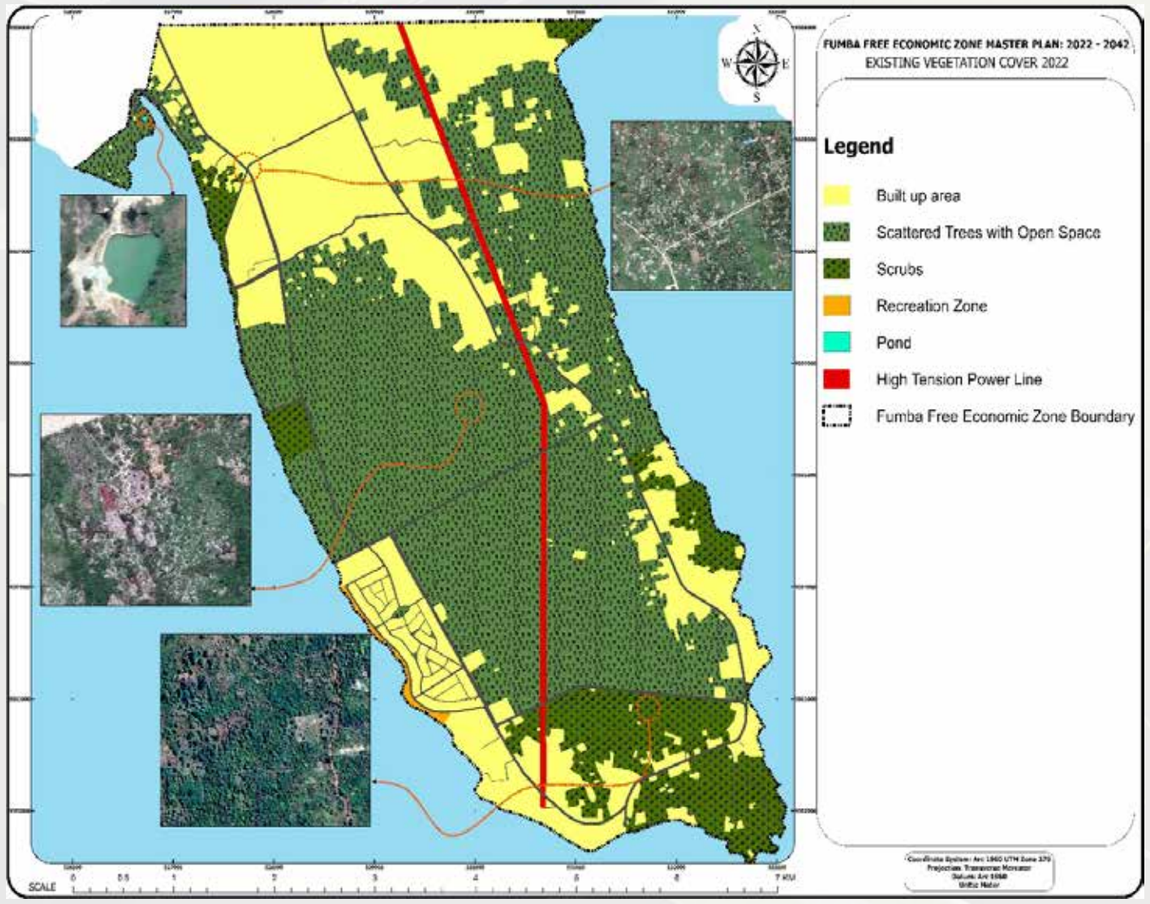
Plate 2. 3: Existing vegetation cover at Fumba Free economic Zone along the way to Nyamanzi village

This Master Plan seeks to integrate green structure in its land use proposals in the quest to create a green and smart city. Thus, in the FEZ, there is a need to create a microclimate that will provide a comfortable environment for the inhabitants. This microclimate can be achieved through a well-designed landscape, which is endowed with well adapted vegetation cover.

Therefore, the choice of plants that are well adapted to the environment is of crucial importance in order that the vegetation remains green throughout the year. It is therefore, recommended that in the course of implementing this master plan, to carryout suitability analysis for different types of vegetation that will be established. The suitability of any vegetation in a particular environment is governed by a number of environmental factors such as temperature, rainfall, altitude, light intensity and soil properties (soil depth, soil texture, soil fertility, soil salinity, organic matter and soil drainage). In developing the Special Economic Zone, soil properties will be improved through addition of organic amendments. In areas that will not be covered by buildings, the soils will be completely covered by vegetation. This will make sure that the whole area will be evergreen thereby creating an oasis microclimate in the area.

Fumba Free Economic Zone is almost surrounded by Indian Ocean with exception of the northern part. The close proximity to the ocean means that the site is vulnerable to strong winds from the ocean. It is therefore of prime importance to think on the way to provide wind breaks. Therefore, a zone of trees of different heights will be planted in an area bordering the Ocean. It is difficult to manipulate environmental factors to suit the requirements of particular vegetation. It is therefore of prime importance to carefully select the plant species that are well adapted to the environmental conditions of a particular location. Map 2.2 shows the distribution of vegetation at the Fumba Free Economic Zone.

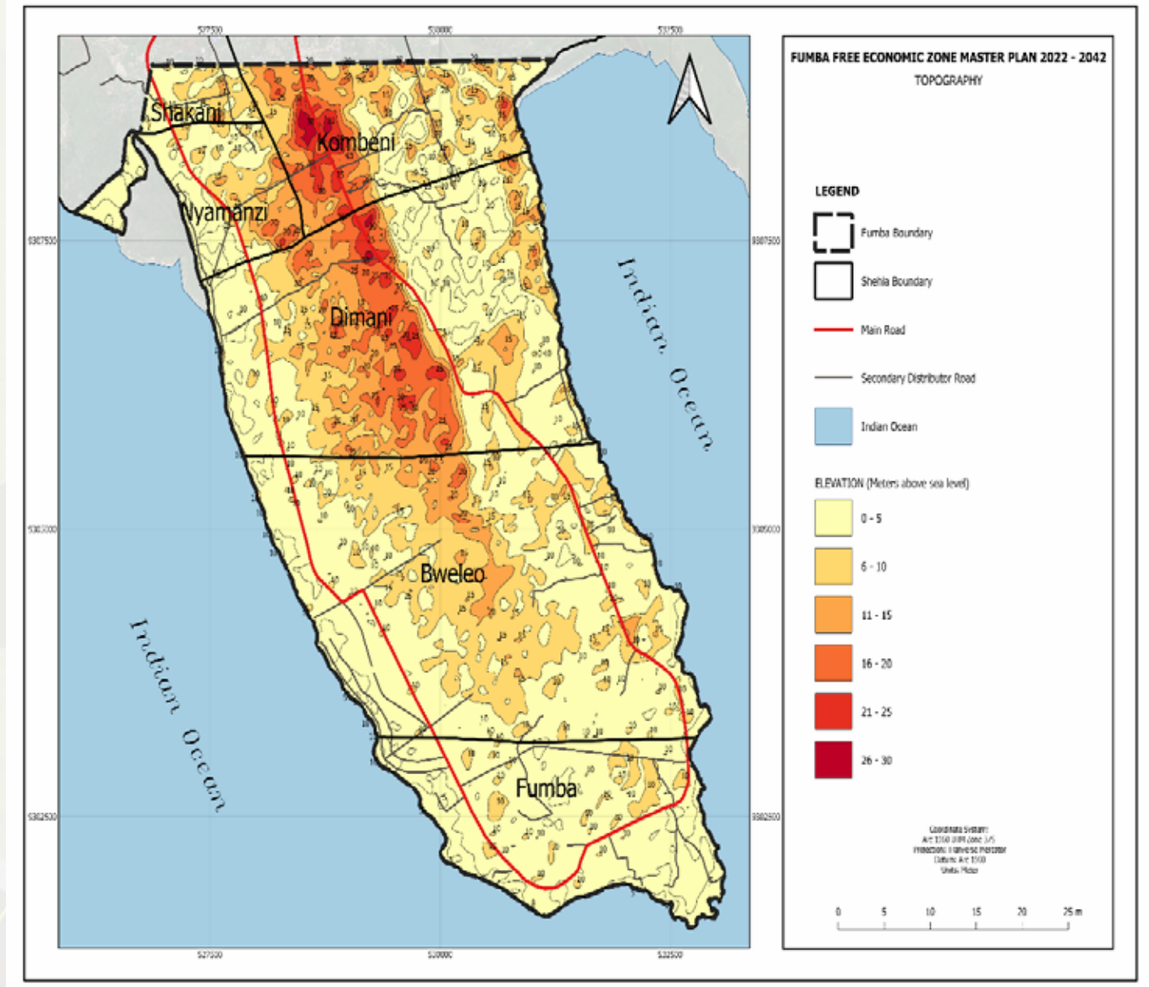
Map 2. 3: Vegetation cover at Fumber Free Economic Zone



2.4 Topography

Fumba FEZ land form is relatively flat with the highest point being 30 m above sea level with exceptional of central areas along the high tension power line which is a bit elevated toward Dimani Village. As shown in Map 2.3, the lowest point being 5m above sea level where rocky borders the ocean especially to the south. Sandy beaches are rare hence beach hotels are not attracted adequately. Indian Ocean coastal belt is the most dominant feature in Fumba FEZ. The shoreline is characterized by rocky beaches where some fishing activities are conducted.

Map 2. 4: Topography of Fumba Free Economic Zone



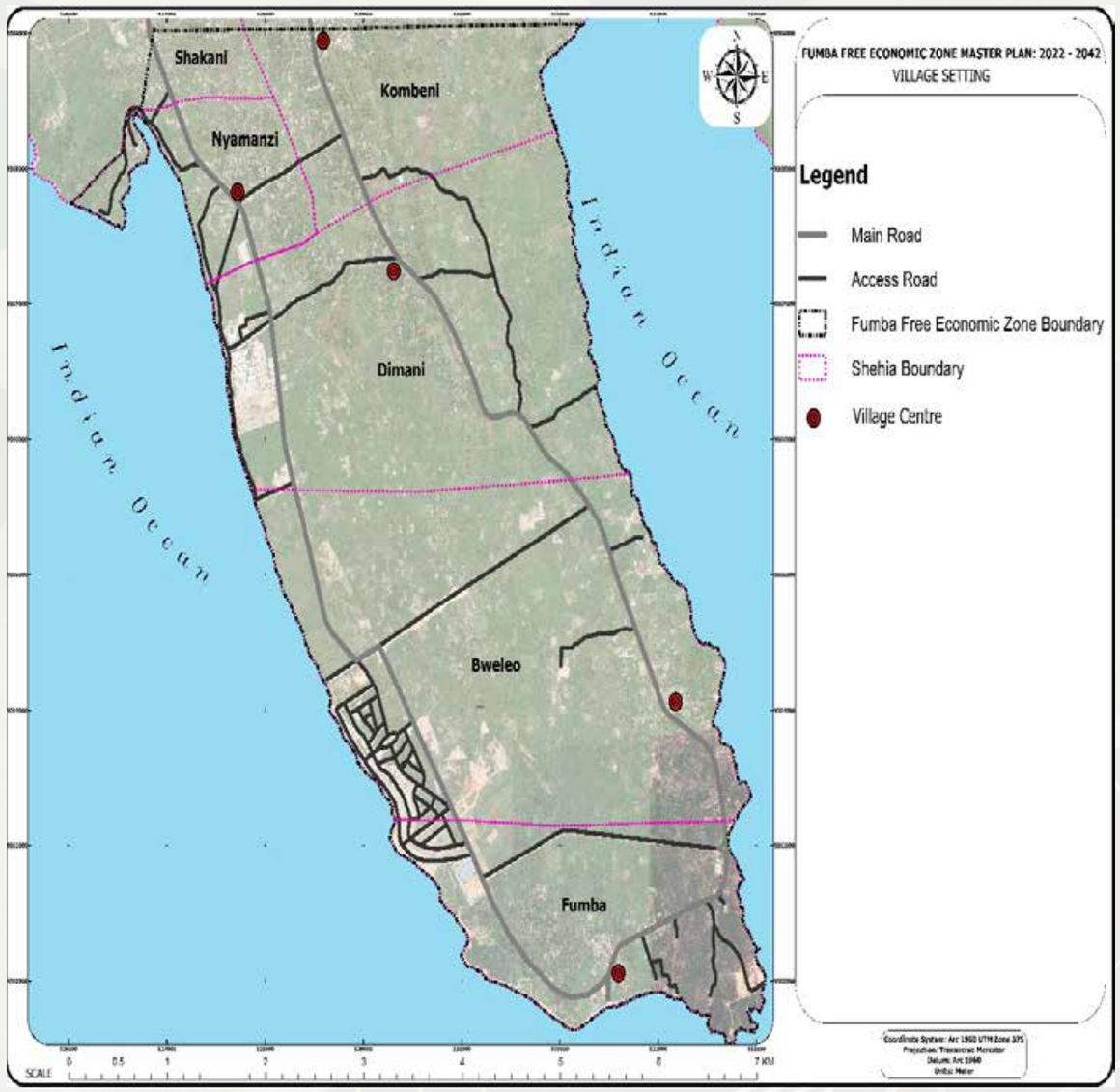
2.5 Demographic and Administrative Issues in Fumba Free Economic Zone

The area declared as Fumba Free Economic Zone (FEZ) in 1992 at Maungani Ward, hosts 6 Shehias namely Nyamanzi, Fumbu, Bweleo, Dimani and Fumbu and partially Shakani and Kombeni (Map 2.2). The population distribution in the 6 Shehia is displayed in Table 2.3. The baseline population is made in 2012 National Population Census whereas the population of 2021 was based on the projection assuming the growth rate of 6%.

Table 2. 3: Population distribution

S/N	SHEHIA	2012	2021
1	KOMBENI	3,162	5,426
2	NYAMAZI	1,287	2,209
3	DIMANI	2,052	3,521
4	BWELEO	971	1,666
5	FUMBA	981	1,683
6	SHAKANI	2,760	4,736
	Total	**11,213**	**19,242**

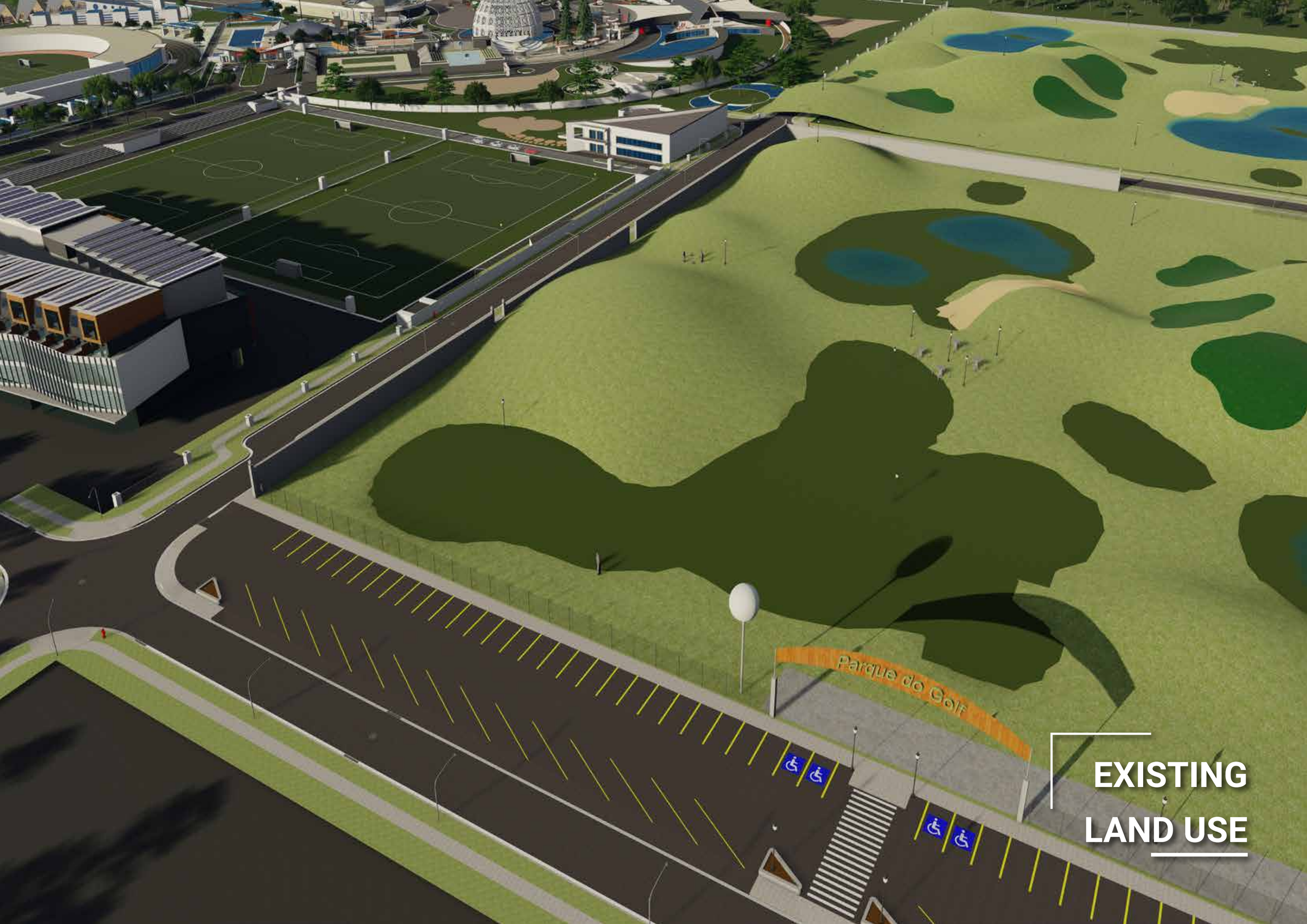
Map 2. 5: Spatial distribution of Shehia in the Free Economic zone



The assumption for population growth as estimated between 2012 and 2042 was based on the current spatial growth trends where many people are now moving to Fumba and other peri-urban zones for residential housing development. It will be assumed such growth trend for the next 20 years of the Fumba Free Economic Zone Master Plan due to also expected interventions in the free economic zone.

It is currently estimated that about 20,000 people reside in the free economic zone largely found in the existing shehia. It was also established that informal land –subdivision by natives and selling plots to people from different part of Zanzibar Town is a common phenomenon. As a result residential houses are sporadically developed all over the Free Economic Zone leaving relatively large pockets of undeveloped land free for investments and farming activities.

Lack of physical boundaries to define or delimiting administrative units for Shehia and that of Free economic Zones forms one of the critical development issues in Fumba Free Economic Zone. It is advised for ZIPA to carry out physical demarcation of Shehia area boundaries in collaboration with local people from the six Shehia of Fumba, Dimani, Bweleo, Nyamanzi, Kombeni and Shakani in order to reduce encroachment into the Free Economic Zone. Currently these areas are not physically defined causing land use overlaps and land use conflict.



EXISTING LAND USE

CHAPTER THREE

EXISTING LAND USE

3.1 Introduction

Analysis of existing land use helps to identify existing socio-economic activities that are either influencing growth or destroy environment. Spatial development issues can also be identified in analysis of existing land use. Potential areas for different investments can also be highlighted. Existing land use can also suggest desirable and sustainable future growth.

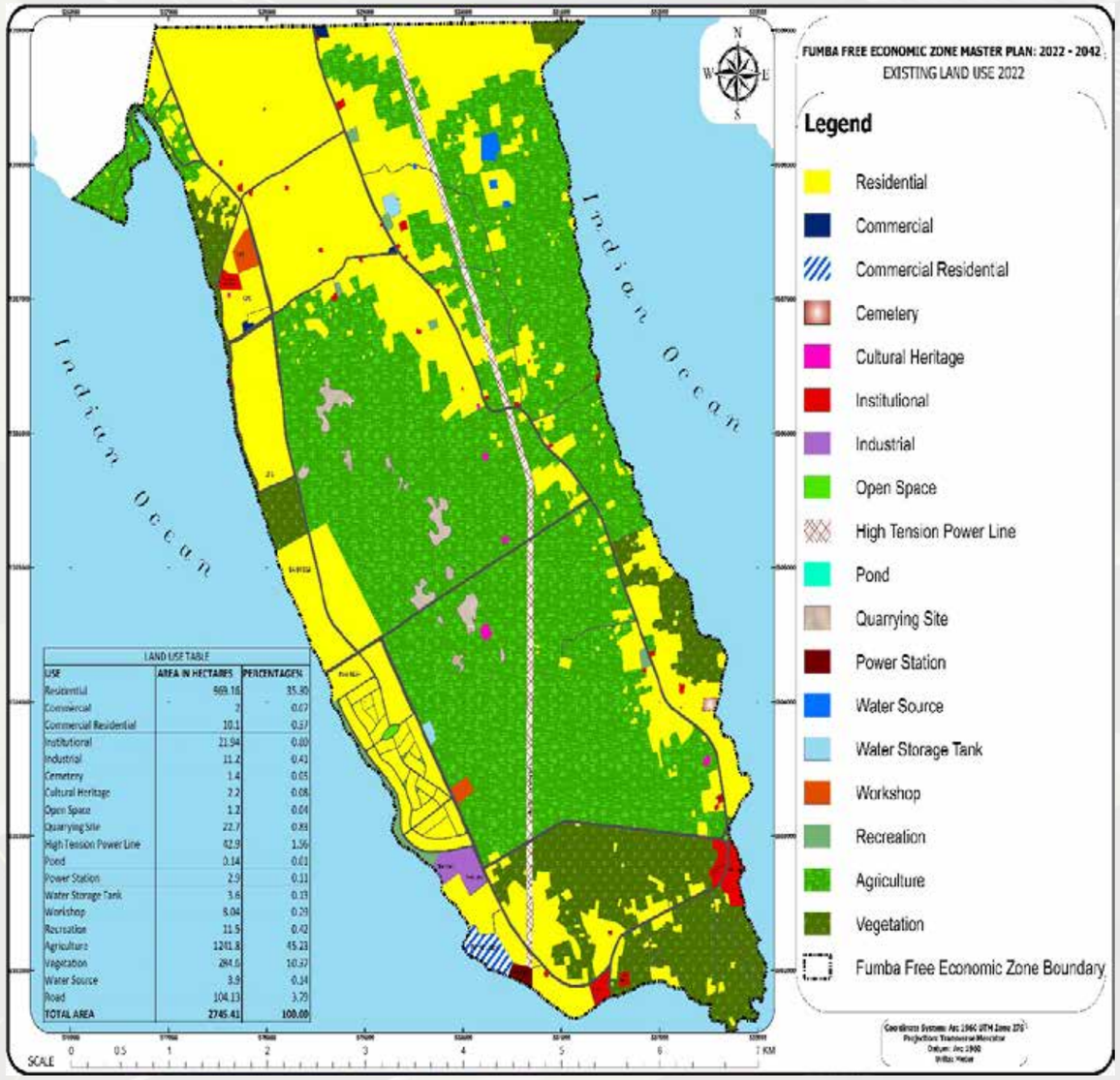
The Free Economic Zone require land-use planning. Land use planning is, usually, the participatory process of regulating the use of land in order to promote more desirable social and environmental outcomes as well as a more efficient use of resources. Land use planning therefore, considers environmental conservation, restraint of urban sprawl, minimization of transport costs, prevention of land use conflicts, and a reduction in exposure to pollutants. Land use means the diverse socio-economic activities that occur in a specific area, water bodies, forests, valleys, hills and circulation systems. It includes both built-up and non-built-up areas. The Fumba Free Economic Zone Master Plan is, therefore, one of the outputs of land use planning that the ZIPA can use to manage the development of the Fumba Free Economic Zone.

The planning area for Fumba Free Economic Zone covers 3,000 Ha which falls also within the existing traditional villages. We would like at this moment to suggest for ZIPA to solicit fund for preparing land use plan for existing Shehia. This will help the villagers to develop their area systematically, efficiently and sustainably. The encroachment to Fumba Free Economic Zone will also be significantly reduced as the clear demarcation of shehia and free economic zone will be made apparent. Every piece of land will be allocated specific use agreed by all villagers. In this ways informal settlements will be avoided in the future Fumba town. The analysis of existing land use will therefore, include existing shehia showing existing community facilities and the land uses in the areas left for the free economic zone. The section will cover Bweleo, Fumba, Nyamanzi and Dimani and areas left for free economic zone investment. Most of the community facilities and infrastructure are concentrated in the aforementioned ***shehia.***

3.2 Existing Land Use for Fumba Free Economic Zone

Existing land use is dominated by the residential, urban agriculture and vegetation. Other land use includes institutional use, commercial and areas occupied by community facilities. Map 3.1 shows existing land use for Fumba Free Economic Zone including land use in existing shehia. On the other hand, Table 3.1 summarizes distribution of existing land use and their spatial coverage in terms of their percentage.

Map 3. 1: Existing Land Use 2021



LAND USE TABLE

USE	AREA IN HECTARES	PERCENTAGE%
Residential	969.18	35.30
Commercial	2	0.07
Commercial Residential	10.1	0.37
Institutional	21.94	0.80
Industrial	11.2	0.41
Cemetery	1.4	0.05
Cultural Heritage	2.2	0.08
Open Space	1.2	0.04
Quarrying Site	22.7	0.83
High Tension Power Line	42.9	1.56
Pond	0.14	0.01
Power Station	2.9	0.11
Water Storage Tank	3.6	0.13
Workshop	8.04	0.29
Recreation	11.5	0.42
Agriculture	1241.8	45.23
Vegetation	284.6	10.37
Water Source	3.9	0.14
Road	104.13	3.79
TOTAL AREA	2745.41	100.00

Table 3. 1: Existing Land use distribution

Existing Land Use	Area (Hectare)	Percentage
Residential	969.16	35.30
Commercial	2.00	0.07
Commercial Residential	10.10	0.37
Institutional	21.94	0.80
Industrial	11.20	0.41
Cemetery	1.40	0.05
Cultural Heritage	2.20	0.08
Open Space	1.20	0.04
Quarrying Site	22.70	0.83
High Tension Power Line	42.90	1.56
Pond	0.14	0.01
Power Station	2.90	0.11
Water Storage Tank	3.60	0.13
Workshop	8.04	0.29
Recreation	11.50	0.42
Agriculture	1241.80	45.23
Vegetation	284.60	10.37
Water Source	3.90	0.14
Road	104.13	3.79
TOTAL AREA	**2745.41**	**100.00**

3.2.1 Socio-economic activities and existing land use descriptions

Fumba Free Economic Zone borders with Indian Ocean to the south, west and east hence may people are engaged in fishing activities as their major economic activities. Small scale-rain fed farming are the other popular economic activities in *shehia found in the Free Economic Zone*.

Plate 3. 1: Fishing activities and local marine transport

Plate 3. 2: Existing fishing activities at Bweleo

Farming is done in a small scale and crops grown are bananas, coconut trees, mangoes, tomatoes, vegetables and pawpaw. Farming is mostly done by the intruders from main land, who practice farming and in-door and zero grazing livestock keeping such as cows and goats. Small scale retail trading is also conducted in various corner-shops in all parts of existing residential settlements.

Plate 3. 3: Banana Farm

Plate 3. 4: Tomato farm

Plate 3. 5: Zero grazing livestock keeping

3.2.2 Land Use in the Real Estate Development Site

Currently, key investors who dominate existing land use in the Free Economic Zone are CPS, Bakhresa and Fumba Beach Resort (Map 3.3). The CPS is one of the real estate developers in Zanzibar (Figure 3.1). Integration of green structure; affordability and equity in housing development and access respectively are among the key features found at the CPS Fumba Town situated in the Fumba Free Economic Zone. Houses of various sizes and standards to meet the needs of different socio-economic groups in the community are provided by the CPS.

Figure 3. 1: CPS Site Development Plan

Basic services such as recreational facilities, water supply, power supply, liquid and solid wastes management are also taken care of. Mixed types of vegetation including natural trees, fruits and grasses are being grown in the CPS site. Some of the houses provided by the CPS are depicted in plates 3.5 and 3.6.

Plate 3. 6: Internal circulation and housing type for lower income earners in CPS site

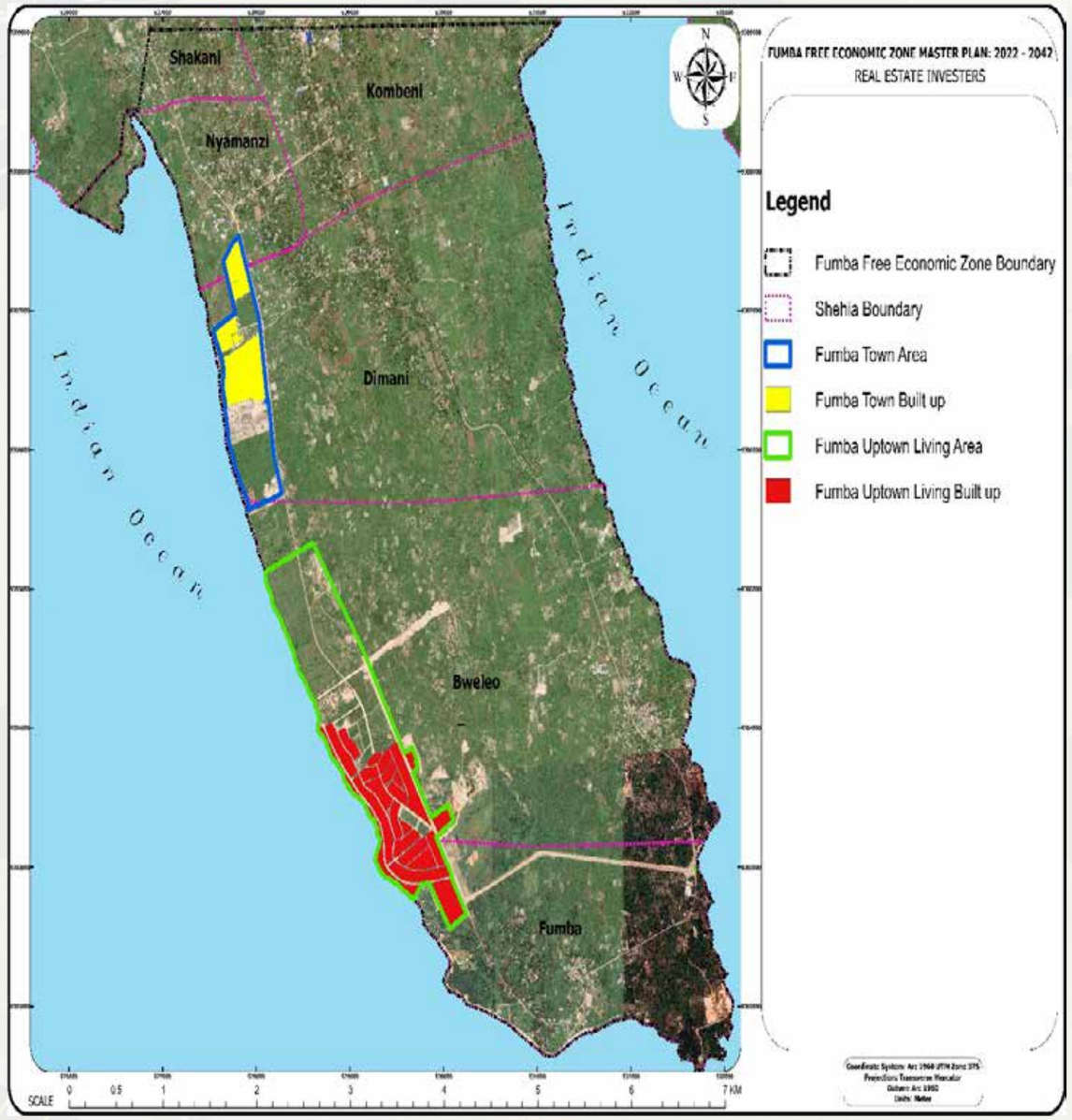
P**late 3. 7:** Apartments facing Indian Ocean for high income earners in the CPS site

Bakhresa is another key real estate developer at Fumba Free Economic Zone. In its site known as "Fumba Uptown Living" there are wide range of housing and accommodational facilities are available. Basic infrastructure such as road network and water supply are also provided in the site and can also be shared with the surrounding community. Plate 3.7 shows some of houses developed at Fumba Uptown Living in the Fumba Free Economic Zone. Infrastructural facilities such as Street lights and Road network are quite apparent in the site.

Plate 3. 8: Real Estate Development in Bakhressa Site at Fumba Free Economic Zone

Hard landscape has been highly used in Fumba Uptown Living. It is advised to combine both hard and soft landscape to reduce the effects of sun rays and heats islands. Integration of green structure with built-up environment create resilience human settlement to the effect of climate change. This Free Economic Zone Master Plan 2022-2042 will promote investments that will create smart city development, promote pedestrian free movement within the green corridor and all transportation corridors must be buffered with trees to enhance micro-climatic condition of the new city. Map 3.2 shows the locations of existing real estate developers in the site.

Map 3. 2: Existing Real Estate Development



3.2.3 Housing development and land use in exiting *shehia*

Housing development in existing ***shehia*** follow traditional style and uses locally available building materials namely stones, blocks, iron sheets and timber. Bundling materials especially stones are readily available in the area. Most of the old houses were built up of stones while the recent hoses are largely built up by blocks and cements. Self-Financing approach is used in housing development within existing ***shehia***. As there is no ***Shehia*** land use plan, houses are sparsely distributed and vehicular accessibility is limited in most of the houses.

Plate 3. 9: Some of houses constructed with stones

Plate 3. 10: Some of houses constructed with cement blocks

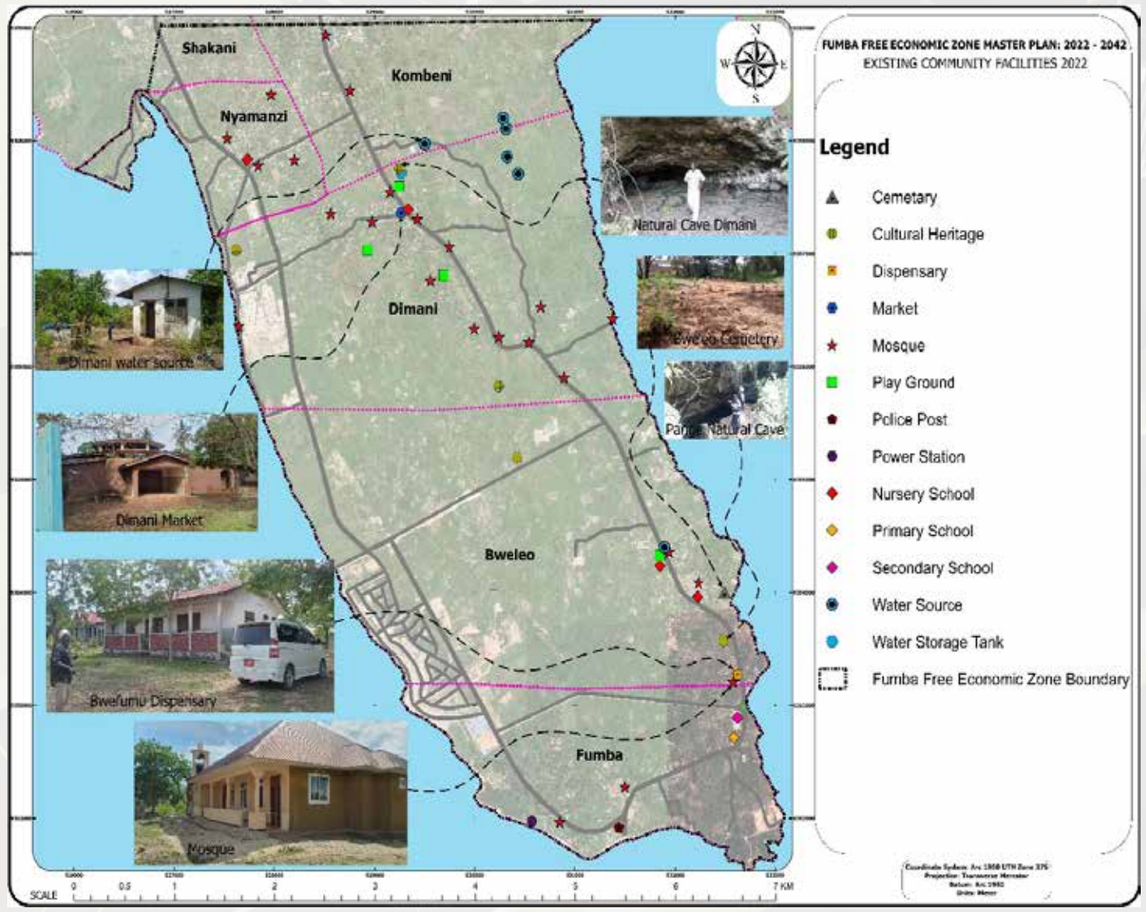
Land use in existing shehia are mixed residential and farming activities, forming a homesteads sparsely developed but concentrated along the main roads and community facilities. The expansion of the shehia is towards the free economic zone. Two suggestions can be made to improve housing development in existing shehia namely preparation of village land use plan for each shehia or regularization of existing land use parcels and titling. Both approaches may limit encroachment to the Free Economic Zone as informal land sub-division will be restricted by law. Both approaches will eventually set aside land for community facilities and accessibility.

3.3 Existing Community facilities

Community facilities identified during the fieldwork and here presented in this section include dispensaries, nursery schools, primary schools, secondary school, cemetery site, religious facilities (mosques), police post and market place. Table 3.2 present in detail types and quantity of the identified facilities. Map 3.2 shows spatial distribution of community facilities which are largely found in existing *Shehia*.

Table 3. 2: Existing community facilities in Shehia within the Free Economic Zone

S/N	Types of facilities	Quantity
1	Dispensary	1
2	Nursery School	4
3	Primary SchoolX	2
4	Secondary School	1
5	Mosque	23
6	Cemetery	1
7	Market	1



3.3 1 Existing community facilities at Bweleo *Shehia*

In 2012, Bweleo had only 971 inhabitants (Magharibi B District Profile, 2017). The number of inhabitants is currently estimated at 1666 in 2021. Bweleo has the following community facilities:

Common Cemetery site

Unlike other ***Shehia*** in Maungani Ward, Bweleo has a community cemetery which is almost full utilized. Therefore, new area is required for communal cemetery. This spatial development issue will be addressed by this Master Plan.

Plate 3. 11: Community Cemetery at Bweleo

Religious facilities

Religious facilities are essential social institutions that form fundamental bonds within the society fabric. They provide sense of relating to the creator and spiritually help society to observe good conduct, ethics and love. There are three mosques in Bweleo. One of the three mosques is located at the centre of Shehia while the rest are situated close to existing industrial areas which are largely used by industrial workers (Plate 3.2)

Plate 3. 12: Mosques at Bweleo

Nursery schools

There are two nursery schools in which one was built by community members (Al-Jadid Nursery School) and the other is privately owned (Al-Mannur Islamic School).

Plate 3. 13: Nursery Schools at Bweleo

Playground

Bweleo has one football playground for all the people in Bweleo and the surrounding communities which is not enough compared to the current population.

Plate 3. 14: Football play ground

Water Well

There is one artificial water well known as Kisima Ng'ombe which supplies water to the community throughout the year. It is the main source of water in Bweleo. Bweleo does not receive water from ZAWA water supply network.

Plate 3. 15: Kisima Ng'ombe

Traditional worship areas

There are three traditional natural caves at Bweleo namely Pange caves, Mwinyi Ngazi and Mwana Mkuu. All of these natural caves are preserved for traditional worshiping and ritual offerings (Plate 3.6).

Plate 3. 16: Natural cave for traditional worship

Natural caves with underground water, apart from supplying water for domestic use, are also used for washing clothes and recreational activities such as swimming (Plate 3.17).

Plate 3. 17: One of the natural caves used for swimming and washing clothes

It was estimated that natural cave occupies an area between 300m2 and 600m2with underground water streams. Most of the natural caves are naturally vegetated on the surface making them cold and protected from pollution as well as human daily development activities (Plate 3.18).

Plate 3. 18: Natural vegetation covers the natural cave to create natural protection.

Dispensary

Existing dispensary at Bweleo is called BWEFUM meaning Bweleo and Fumba as it is shared by both Fumba and Bweleo. The dispensary is built adjacent to Fumba administrative boundary which makes it easily accessible by people of the two Shehias (Plate 3.7).

Plate 3. 19: BWEFUM Dispensary

Market Place

There is no market place in Bweleo, they usually buy and sell their commodities in the nearby market at Kombeni which is the neighboring ***shehia***. It was also reported that the residents at Bweleo needs their own local market to cut down the transportation cost to Kombeni Market.

3.3.2 Community facilities at Fumba

In 2012, Fumba had only 981 inhabitants (Magharibi B District Profile, 2017). The number of inhabitants is currently estimated at 1683 in 2021 suggesting that the population is increasing rapidly. Bweleo receives its health care from Bwefum dispensary which is located in Bweleo. It has both primary and secondary schools. In addition, Fumba Shehia has two mosques and police post to cater for Fumba, Bweleo, Dimani and Nyamanzi. There is also areas reserved for establishing local sub-office for president. The is also adjacent to Azam Diary Products Limited.

Plate 3. 20: Secondary School building at Fumba

3.3.3 Community facilities at Nyamanzi

In 2012, Nyamanzi had only 1,287 inhabitants (Magharibi B District Profile, 2017). The number of inhabitants is currently estimated at 3,521 in 2021 suggesting that the population is increasing rapidly. The only available education facility is one public nursery school (Plate 3.9). There is one private school which is under construction. Nyamanzi has four mosques in which of them are relatively big providing adequate space for Friday praying session (Swala ya Ijumaa) and the other two are small mosques used for other daily religious activities (Plate 3.10). Mwambegu is a natural cave for rituals and traditional worshiping area.

Plate 3. 21: Primary school at Nyamanzi

Plate 3. 22: Mosques at Nyamanzi

Nyamanzi receives water from the ZAWA water supply network with its sources from Water distribution Tank located at Dimani. Water is not reliable as itis not available all the time. The local shallow well drilled by local people are used to supplement water deficit from ZAWA.

3.3.4 Community facilities at Dimani

Unlike other Shehia discussed above, Dimani is the Shehia where most social services are concentrated. Dimani has public and private nursery schools as well as primary school. Plate 3.12 shows existing primary school at Dimani.

Plate 3. 23: Public Primary School at Dimani

There is one public nursery school and one private nursery school. Currently, the private nursery school has not yet secured a full permission to operate at Dimani. In addition, Dimani has three football paly grounds whereby one ground is used largely by Dimani Primary School. One of the remaining two grounds open for public use while the rest one is under religious institution ownership and is used by "madrasa pupils.

Plate 3. 24: One of the football play grounds in Damani

Dimani is a ***Shehia*** with the highest number of mosques of the six ***shehias*** found in the Free Economic Zone. It has 14 mosques of different sizes in which 2 of them are relatively big and used for Friday prayers. The other 12 mosques are distributed in different places of Dimani to serve grassroots at their localities thus minimizing travel distance to the central mosques.

Plate 3. 25: Some of the mosques found in Dimani

Dimani has a descent and relatively big market in a good condition. It was under-utilized and not vibrant like market in the downtown but serves wide range of local people from other ***Shehia***. As it was not full-utilized it appears as a seasonal market (Plate 3.15). Its physical condition, structure and size is adequate to accommodate current and future population growth. The proposed interventions by this master plan will have future influence of the utilization of the market.

Plate 3. 26: Dimani Market

Dimani ***Shehia*** has the most elevated land as compared to the neighboring ***Shehias***. As a result, ZAWA has established water storage tank with capacity of 300,000 litres to supply water to the rest of the area in Mjini Magharibi Region (Plate 3.16). The tank receives water from two pipes from two different water sources. One of the sources is from underground cave called Machumvi Kubwa cave and the other water source is from a deep well. In addition, about 2.2 Ha has been set aside for underground and on surface water stotorage facilities(Plate 3.27).

Plate 3. 27: Construction site for water storage tanks at Dimani

In the course of documenting existing land uses and existing community facilities in the Free Economic Zone, several caves with fresh water were identified apart from Chomoani cave in Dimani. The other popular caves include Machumvi Kubwa and Machumvi Ndogo which are important water sources in Dimani. There other small caves with fresh water distributed in various areas in Dimani and other Shehia in the free economic zone (Map 3.3).

Natural caves are therefore, one of the dominant land use features found in the shehia; some of the have fresh spring water while other have not. The dry caves are usually used for ritual and which do not have water are used for traditional rituals activities including traditional worshiping and shrines including Chuu. Such areas need to be preserved for historical purposes and traditional activities.

3.4 Development constraints and Potentials

Uncontrolled and unregulated spatial expansion of existing Shehia, natural and underground caves, proliferation of quarrying activities in the free economic zones and high tension power line corridor are key development constraints in the Free Economic Zone. Rocky soil may be both potential for construction but constraints when it comes to underground natural caves, paforated rocks. The underground caves may also pose threats in the overall development of the Fumba Free Economic Zone in particulary heavy structure including housing estate and appartments and road networks.

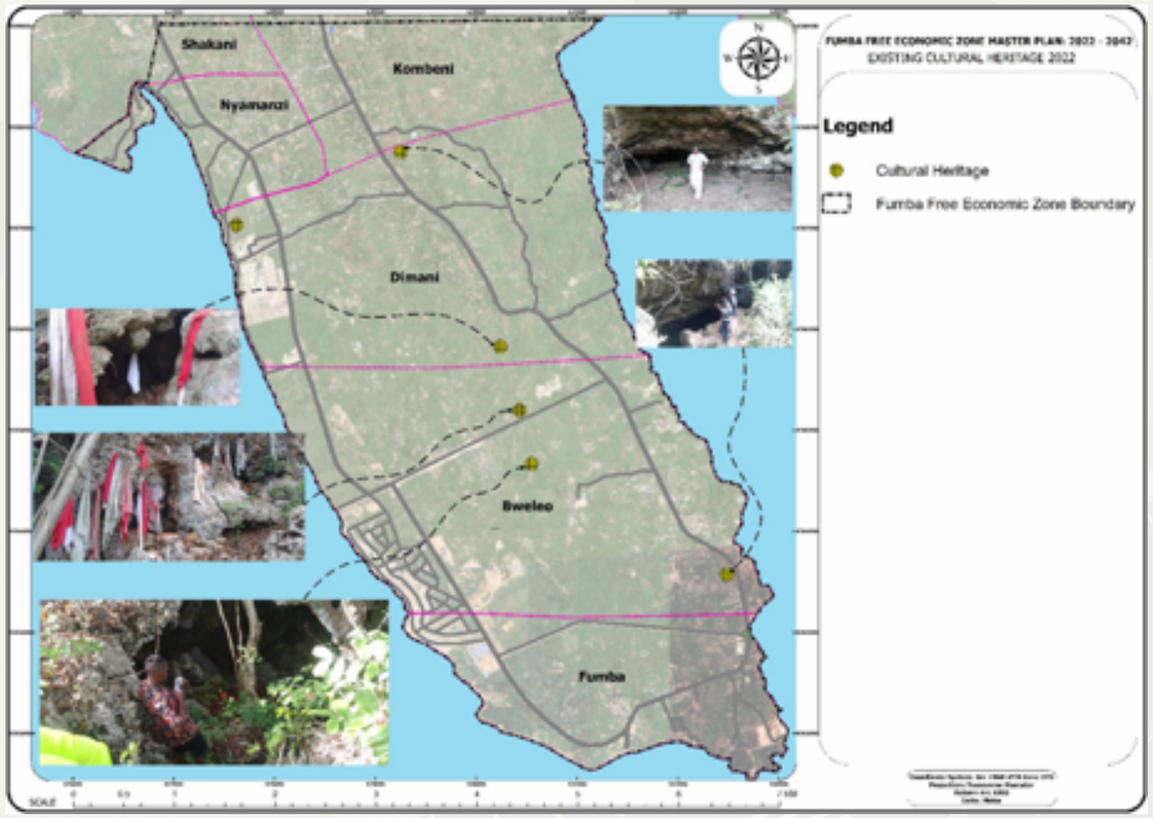
Plate 3. 28: Uncontrolled quarrying activities constrain site development

Plate 3. 29: Peforated rocks spreading along the existing high tension power line

Plate 3. 30: Natural undeground caves

The underground caves constrain fully development of the economic zone. They should be identified and protected for tourist atractions as shown in Map 3.3.

Map 3. 3: Location of natural caves in Fumba Free Economic Zone



3.5 Site development potentials

Basic Potentials in the Free Economic Zones at Fumba include availability of fresh water in underground caves, rocks as important construction materials for roads, housing and storm water drainage canals. Natural vegetation is also available for environmental conservation and micro-climate. There is basic transportation network in Fumba Free Economic Zone to facilitate transportation of goods and services, including building materials during the implementation of the proposed projects in the master plan.
Availability of local skilled, semi-skilled and unskilled labours to be engaged in the construction activities, institutional structure at local level such as Shehia and grassroots leader such as sheha to participate in awareness creation about investments in the Free Economic Zone and investment benefits as well as opportunities for employments and investment.
ZIPA in collaboration with government leaders, local politicians, investors and other stakeholders may hastern the promotion of investments through utilization of available potentials to create facilitative environment (roads, water supply, power supply and liquid waste management system) for direct investments locally and internationally.

ECONOMIC ANALYSIS

CHAPTER FOUR

ECONOMIC ANALYSIS

4.1 Objectives of the economic analysis

The main objective of this chapter is to provide an analysis of the current and future drivers of the Zanzibar economy that would influence the design and viability of the Development of Fumba Free Economic Zone. The FEZ would be the single PPP project aimed at attracting a concentration of both local and foreign investments into the Island. Inevitably, it is expected to influence not only the economic development of the island but will also impact on social and cultural development. This chapter focuses on the analysis of existing economic activities in Zanzibar that forms an important tool to inform Spatial Development of Fumba Free Economic Zone. It is therefore, an integral part of the Fumba Free Economic Zone Master Plan 2022-2042.

4.2 Free Economic Zones in Zanzibar

In 1992 the Revolutionary Government of Zanzibar (RGZ) promulgated a free economic zones act that designated two FEZs aimed at attracting manufacturing and processing investments into the zones as a way to stimulate growth, employment and economic development on both islands. The five identified Free Economic Zones are Fumba Zone, Amaani Industrial Park, Airport Free Port, Maruhubi Free Port and Micheweni. As for the Fumba area which occupies 3000 hectares, was previously demarcated into four (4) zones which are industrial park, real estate, logistic zones and Shehias. There is also a plan for the development of infrastructure for water, electricity and road network (Kisauni - Fumba Ring road). There is a signed agreement for the PPP between Government and Fumba Up Town Living (Bakhresa Group of Company) to develop the Special Purpose Vehicle which is a company called the Fumba Bay Development Co. Ltd to develop the Fumba Commercial City. Another 150 hectares were leased to Azam Group of Company to develop the Fumba Satellite City by constructing about 600 units of settlement and other facilities, and 60 Hectares was leased to CPS for construction of 1,500 units of settlements and other facilities in the first phase.

Like other zones in Zanzibar, the Zanzibar Investments Promotion Authority (ZIPA) designates the FEZs to attract Foreign Direct Investment (FDI), specifically labour intensive projects that increase exports. Companies are expected to set their business in those designated areas to enjoy simplified customs and other administrative procedures. As for Fumba Free Economic Zone, attention is largely given to real estate development combined with other urban functions of higher order such as sport stadium, hospitals, recreational facilities, central market and commercial complexes, civic centre, ICT park, research and training institutes as well as smart and modern transport facilities.

4.3 Macroeconomic setup

4.3.1 GDP and Per Capita GDP

Over the past twenty years, the economy of Zanzibar has been growing at the annual rate of not less than four per cent (the minimum growth was 4.3 per cent recorded in 2008 and 2010). However, Zanzibar recorded the highest growth rate of 7.7% in 2018, which is still lower than the targeted rate of 9 per cent to 10 per cent as deemed necessary to eradicate abject poverty. Per capita GDP is a major indicator to measure of reaching Low Middle-Income Country (LMIC) status. Based on a 2019 Zanzibar Statistical Abstract Report showed that, during implementation of Vision 2020 the per capita income rose to USD 1,114 in 2019 from USD 298 in 2000, Zanzibar crossed the LMIC threshold of per capita income of USD 1,036. Despite of the decline of the per capita income for the year 2020 to USD 1099 as reported in Table 3.1, Zanzibar maintained its status of Low Middle Income Country. Noteworthy, the per capita income decline was attributed by the decline in GDP growth rates 1.3% in the year 2020 due to COVID-19 pandemic. However, in the past experience GDP per capita has grown steadily from $523 in 2007 to $830 in 2016 and picked to $ 1,114 in 2019 before dropped $1,099 as reported in Table 4.1 below.

Table 4. 1: Social Economic indicators for Zanzibar

GDP at Market Prices	2016	2017	2018	2019	2020
At current prices (Billion Shillings)	2,749	3,228	3,663	4,132	4,209
At constant 2007 prices (Billion shillings)	2,491	2,684	2,874	3,078	3,116
Quantity index (2015=100)	106	114	122	131	132
Constant price growth rates (%)	5.8	7.7	7.1	7.0	1.3
Implicit price deflators (2015=100)	110	120	127	134	135
GDP per capita at current prices					
GDP per capita (TZS '000)	1,889	2,104	2,323	2,549	2,526
GDP per capita (US $)	868	944	1,026	1,114	1,099

GDP per capita at constant 2015 prices					
GDP per capita (TZS '000)	1,712	1,750	1,823	1,898	1,870
GDP per capita (US $)	857	876	913	951	936
Memorandum items					
Population ('000)	1,455	1,534	1,577	1,621	1,666
Exchange rate TZS per US $	2,177	2,229	2,264	2,289	2,298

Source: Office of Chief Statistician, Nov. 2021, Zanzibar

4.3.2 Inflation

The trend of the overall inflation rate in Zanzibar for the last five years remained in a single digit which good to spur economic growth. It was further observed that annual headline inflation declined to 0.5% in the year ending 2020 as compared to 1% in the year 2019 (OCGS, 2020). The average annual inflation rate in 2016 was 6.7% compared to 5.8% reported in 2017, and continues to decline to 3.9% and 2.7% in the years 2018 and 2019 respectively before it increases marginally to 3.4% in the year 2020 which might be attributed by COVID 19 pandemic. Specifically, in 2016, the average annual food inflation rate was 8.4% and average non-food inflation rate was 4.8% while in 2017 annual food inflation rate declined to 5.5 % and non – food inflation rate was 5.7%. The average annual food inflation increased from 1.4%, 2.8% in the years 2018 to 2019 years respectively before in increases more than double to 5.8 in the year 2020 as reported in Table 4.2 and Figure 4.2 respectively. Given Zanzibar governance arrangements in the Union with Tanganyika, its trading landscape is captured by looking at the interstate trading performance. Inter-State trade statistics provides an idea about the demand of commodities produced or consumed in Zanzibar along with flows thereof to the other side of country that is Tanzania Mainland. Different goods transferred include foods and non-foods items, such as building hardware, transport hardware and other imported materials from mainland.

Table 4. 2: Zanzibar Inflation Trends

Description	2016	2017	2018	2019	2020
Food	8.4	5.5	1.4	2.8	5.8
Non Food	4.8	5.8	5.7	2.6	1.7
All Items	6.7	5.6	3.9	2.7	3.4

Source: Zanzibar Statistical Abstract, 2020

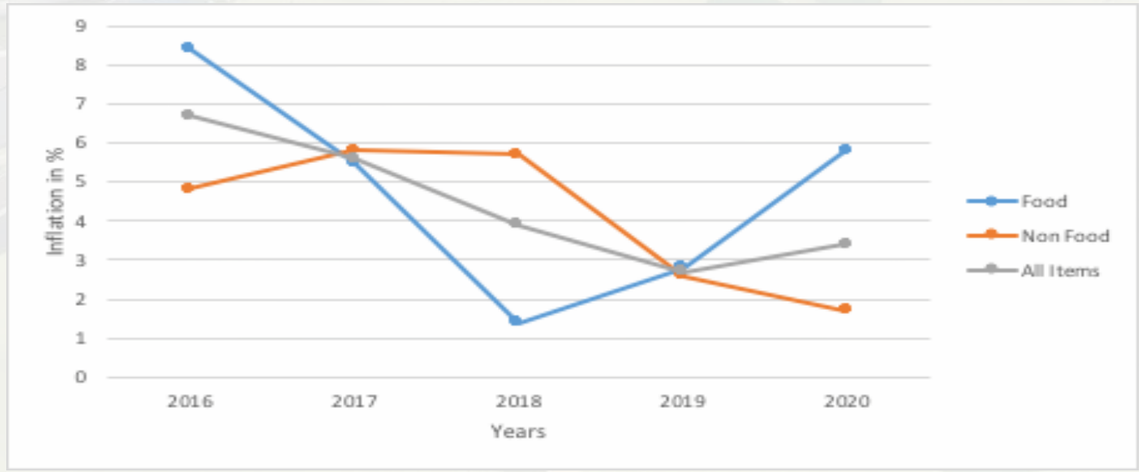


Figure 4. 1: Zanzibar Inflation Trends

Source: Consultant Computation from Zanzibar Statistical Abstract

4.3.4 Trade Performance

Trade is important and essential ingredients in economic development and poverty reduction. The sectors encompass large part of private sector that contributes much to the economic and social development through employment creation as well as government revenue contribution. As reported in Table 4.3 and Figure 4.3, total trade for the year 2020 reached to TZS 913,091.8 million indicates an increase of 13.58 percent over TZS 803,884.6 million recorded in the year 2019; exports increased 65,661.0 million from TZS 48,573.3 million and imports valued to TZS 847,430.8 million as compared with TZS 755,311.3 million accounted in the year 2019. The recorded export values in 2016 was TZS 96,234.9 million which increased to TZS 145,756.8 million recorded in 2017. Vegetable products contributed TZS 69,077.1 million equivalents to 71.8% of the total export value. The exported value of Cloves recorded in 2016 was TZS 64,723 which is equivalent to 67.3 % of the total value. For the last five years, India appeared to be the major buyer of the exported commodities from Zanzibar, especially cloves. The value of the imports in 2016 was TZS 16,088.0 million which indicates an increase of 6.5% compared with 156,941.1 recorded in 2015. Machinery and Mechanical Appliances, Electrical products recorded the highest value of TZS 3,958.6 of the total import. The trade balance in 2016 has shown a deficit of TZS 70,853.1 million compared with the deficit of TZS 114,534.1 million recorded in 2015

Table 4. 3:Value of Imports and Exports, 2016-2020 (TZS Millions)

Description	2016	27	2018	2019	2020
Imports	460,919.8	531,026.2	760,122.8	755,311.3	847,430.8
Exports	96,234.9	145,756.8	58,187.0	48,573.3	65,661.0
Volume	263,322.9	357,170.2	394,034.7	803,884.6	913,091.8
Export-Import ratio	20.9	27.4	7.7	6.4	7.7
Volume Growth Rate		35.64	10.32	104.01	13.58

Source: Zanzibar in Figures, 2020

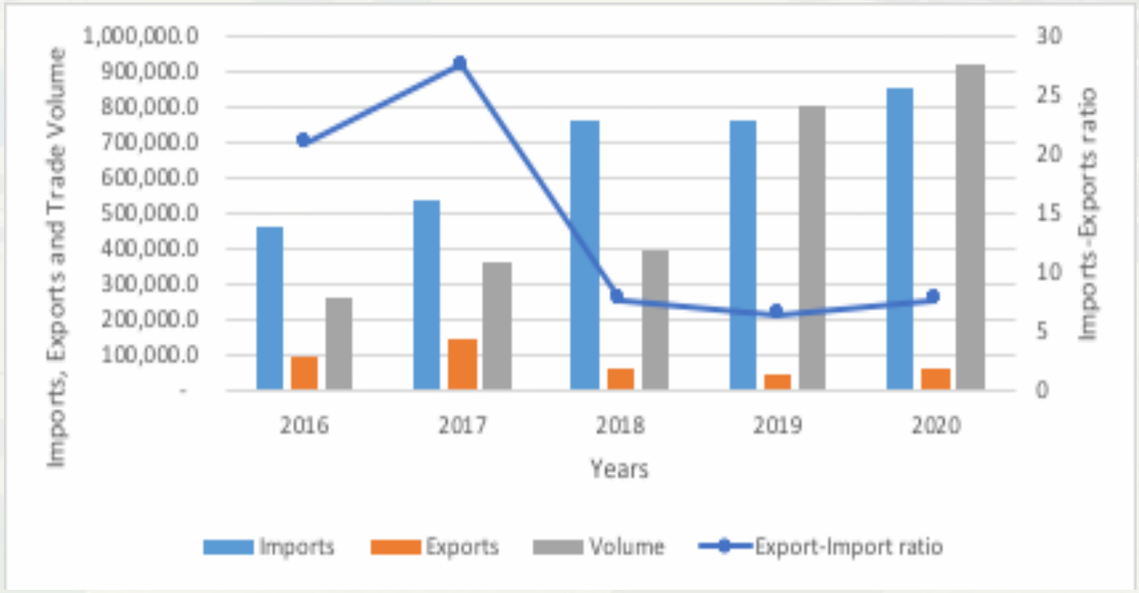


Figure 4. 2: Value of Imports and Exports, 2016-2020 (TZS Millions)

4.3.5 Public Finances

Monetary policy which is one of drivers of revenue is handled at the national level by the Union Government. A review of the Bank of Tanzania's monetary policy statement indicates that during the first half of 2017/18, Zanzibar domestic revenue amounted to TZS 320.5 billion, or 96.2% of estimates for the first half of 2017/18. Tax revenue amounted to TZS 289.9 billion, while non-tax was TZS 30.6 billion. Total grants amounted to TZS 18.9 billion, higher than the projected amount by 10.5%. Total Zanzibar government expenditure was TZS 378.2 billion, out of which recurrent expenditure was TZS 298.3 billion and development expenditure amounted to TZS 79.9 billion. The current account recorded a surplus of USD 34.4 million during the first half of 2017/18, compared with a surplus of USD 26.9 million recorded in the similar period of 2016/17. The performance was on account of improved receipts from exports of goods and services, mainly cloves and tourism services, as well as higher inflows of current transfers. Generally, Zanzibar continues to grow as expected and projected by the Bank of Tanzania (BoT). The economy grew at a rate of 7.7%, 7.1% and 7.0% in the 2017, 2018, 2019 years respectively, driven mainly by the tourism services sector before dropped to 1.3% attributed by COVID 19 pandemic. The growth is guided by implementation of the medium and long-term policies including Vision 2050, Zanzibar Strategy for Growth and Reduction of Poverty III—MKUZA III—and Sustainable Development Goals 2030. The economic growth potential which was driven by tourism sector creates a confidence that, the Fumba Free Economic Zone Master Plan 2022-2042 will nourish and enables more expansion of economic activities.

4.4 Sectoral contribution to the economy

A breakdown of sectoral performance provides an indication of the most important and current drivers of the Zanzibar economy, which in turn informs the Fumba Free Economic Zone Master Plan.

4.4.1 Services including tourism

This sector grew -1% in the year 2020 as compared to 8.7% from 10.4 % in the years 2019 and 2018 respectively. This drastic decline of the service sector was mainly driven by COVID 19 pandemic that resulted into the decline of tourist arrivals by 51% as reported in Table 3.3. Noteworthy, tourism sector has been recording the highest growth as compared with other sectors of the economy as presented in Table 4.3 indicating the potentiality of venturing into that sector, however there was a remarkable drop of tourism activities in the year 2020 (-51.6%) due COVID 19 pandemic. Most of the tourists were from Italy, Germany, United Kingdom, United States of America and France. Table 4.4 and Figure 4.3 Shows the five years' cumulative tourist arrivals from different continent; 63.4 % of tourists arrived from Europe, followed by America and those who are not stated were 1.6%.

Table 4. 4: Number of Tourist by Continent

Nationality	2016	2017	2018	2019	2020	Total Visitors
Europe	233,157	275,402	311,177	341,756	189,031	**1,350,523**
Asia	58,108	57,703	57,305	42,536	14,210	**229,862**
Africa	46,016	51,457	52,674	61,312	23,347	**234,806**
America	30,404	38,344	71,574	74,247	29,393	**243,962**
Oceania	5,359	7,074	13,364	8,633	2,435	**36,865**
Not Stated	3,198	3,494	14,715	9,780	2,228	**33,415**
All Countries	376,242	433,474	520,809	538,264	260,644	**2,129,433**
Growth Rate	27.9	15.2	20.1	3.4	-51.6	

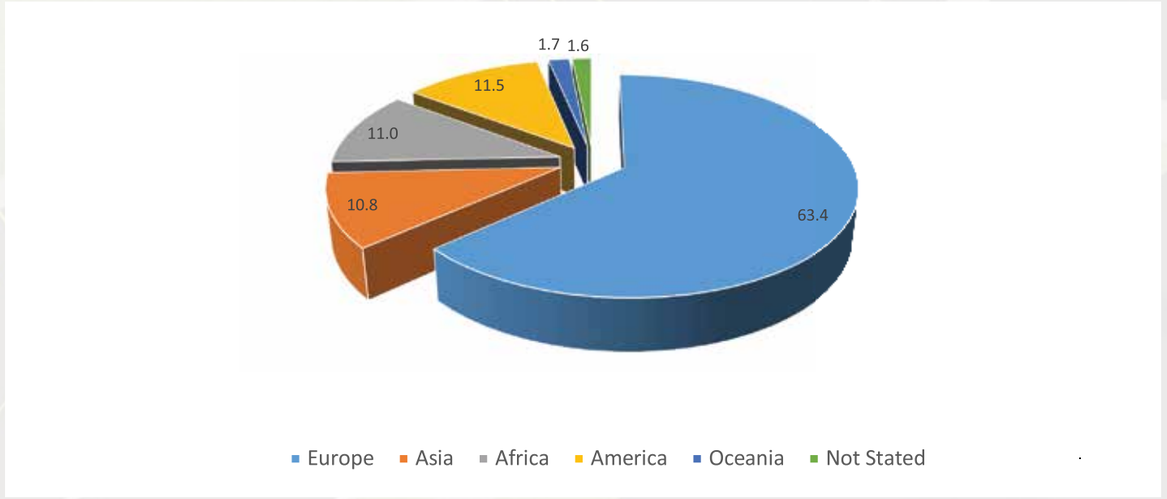


Figure 4. 3: Number of Tourist Arrivals by continent

4.4.2 Agriculture, Forestry and Fishing

The activity in these sectors were fluctuating overtime, in 2015 the growth rate was 2.5% before it increased to 5.7% in 2016. The growth in these sectors picked up in 2017 when the recorded growth was, 7.9% before it dropped to 3.7% and 2.6 in the years 2018 and 2019 respectively. While in the year 2020 it increased marginally to 3.3% as reported in Table 3.6 the positive growth was attributed to favorable weather, but decline in recent years may be attributed to COVID 19 pandemic. Main contributors to the growth of this activity was crops sub-sector, particularly increase in the production of cloves and horticulture. Growth in fishing subsector slowed mainly attributed to supply-side challenges. Notwithstanding the decline in volume from 34,104.0 tons in 2015 to 33,892.0 tons, the value of fish sold in the domestic market increased by 0.2 % to TZS 136.2 billion, owing to increase in the price in the domestic market.

4.4.3 Industry and Construction

The value added in industry was fluctuating overtime as reported in Table 4.6, in 2015 grew by 10.6 before it dropped to 9.7 % in 2016. Meanwhile this sector dropped from 5.6% to 2.2% the years 2017 and 2018 respectively. It was further observed that, the sector picked up in the year 10.6 in the year 2019 before it dropped to 5.2% in 2020 which might be attributed by COVID 19 pandemic. Manufacturing grew by 6.2 % and contributed 6.9 % of the nominal GDP, mainly driven by processing of dairy products, beverages and bread.

Table 4. 5 :Sectoral share of GDP 2014 to 2018

Sector	% Share of GDP by Year					
	2015	2016	2017	2018	2019	2020
Agriculture, forestry and fishing	25.8	25.7	21.5	21.3	21.2	22.8
Services	46.1	45.1	48.6	51.3	50.7	47.8
Industry	18.1	18.6	19.6	17.8	18.1	19.6
Manufacturing	6.7	6.9	6.5	5.7	6.6	7.7

Source: Source: Zanzibar Statistical Abstract, 2020

Table 4.5 shows the sectoral contribution to GDP in Zanzibar from 2015 to 2020 indicating that services sector was mainly contributor at an average of 48.3 % in the respective year from 2015 to 2020. On average the service sector was contributing 47.16% to the total GDP. It also recorded an increasing trend from 46.1 % to 51.3 % in the years 2015 and 2018 respectively before it declined to 50.7 in the year 2019 and 47.8 in the year 2020. This forms a good indicator for investing in service sector in Zanzibar.

Table 4. 6:GDP Growth Rate by Sector (% Change at 2007 Constant Prices)

Sector/year	Annual Growth Rate					
	2015	2016	2017	2018	2019	2020
Agriculture, forestry and fishing	2.5	5.7	7.9	3.7	2.6	3.3
Services	7.9	8	7.7	10.4	8.7	-1
Industry	10.6	9.7	5.6	2.2	10.6	5.2
Manufacturing	8.8	6.2	8.6	-1.6	20.5	6.5

Source: Zanzibar Statistical Abstract, 2020

4.5 Economic Infrastructures

Economic infrastructures are key lubricants to economic growth and development of any country. For instance, tourism sector development in Zanzibar, tourism vehicles, human capital, tourists, technology, and machinery can be imported from other countries through shipping and air transport. Zanzibar connects to the rest of Tanzania and the rest of the world by Abeid Amani Karume International Airport and Habour. Abeid Amani Karume International Airport was previously known as Kisauni Airport and Zanzibar International Airport. It was renamed in 2010 in honour of Abeid Amani Karume, it is one of four international airports available in Tanzania. Moreover, Zanzibar is also connected with Tanzania main land by using modern boats and the rest of the world by Ships.

4.5.1 Airport

Zanzibar's main airport, Zanzibar International Airport popularly known as Abeid Amani Karume International Airport, has been able to handle large passenger planes since 2011, which has resulted in an increase in passenger and cargo inflows and outflows. Since its expansion it has now have the capacity of serving up to 1.5 million passengers per year. The island can be reached by flights operated by Air Tanzania, Auric Air, Kenya Airways, Qatar Airways, Turkish Airlines, Fly Dubai and Coastal Aviation. Meanwhile Pemba airport is for domestic and light weight flights from neighboring countries. Note worthily, "Zanzibar achieved impressive compound annual growth of 19% in total passenger arrivals by air and sea from 2013 to 2017, stimulated by a rise in direct flights. The destination has also benefited from increased global recognition of its upscale and luxury hotels. Such that, in 2017, the island received 433,474 passenger arrivals, which rose by 15% compared to the previous year. Tourists can access the island via both by the seaport and airport. While the proportion of seaport passenger arrivals slightly declined year-on-year, more visitors arrived via the airport. There is new airlift from Italy and increasing frequency in existing popular routes.

4.5.2 Port infrastructure

Cross-border trade comprises a main share of businesses in Zanzibar's economy including both imports and exports. The main merchandize imports of Zanzibar come from China and the Far East, Persian Gulf Countries, India and some European countries. The major exports leaving Zanzibar's port facilities are cloves, seaweed and other locally produced goods going to other countries. The main entrance for imports and exports in East Africa is the port of Malindi, which is one of the oldest ports in the region, and has an advantageous location along key trade route.

4.5.3 Roads Infrastructure

Roads are essential for economic growth and the competitiveness of a vibrant economy. They important sector in enhancing tourism sector and other sectors of the economy. They also increase tourist flow from one park to hotel and other tourism attractions facilities. Zanzibar has about 1,600 kilometers of roads, of which 85% are tarmac or semi tarmac. The remaining (15%) are earth roads, which are rehabilitated annually to make them passable throughout the year (investment guide 2017). Condition of the existing road network on the Island reflects some of challenges in road maintenance including climate and natural resource conditions, and insufficient funding for construction and maintenance of roads through existing mechanisms.

5.5.4 Telecommunication

The telecommunication industry forms the important inputs into the tourism sector more formally will be key input into the growth and Development of Fumba Free Economic Zone. The telecommunication system in Zanzibar is effective for both local and international calls. Advanced mobile phone technology is available, and the country is well served by telecommunication companies operating not only in United Republic of Tanzania but also in the East African region and beyond. Information and Communication Technologies (ICT) are increasingly being recognized as powerful enablers for economic, industrial and social development. ICT can advance economic growth, enhance social inclusion, increase enterprise growth, increase health and education services, and improve governance at all levels.

5.6 Magharibi B District Economic Analysis

The present social economic profile of June, 2017 provides useful information for district economic activities. The district's main economic activities are agriculture, forestry, fishing, hunting, livestock, mining and quarrying, manufacturing, hospitality, construction and merchandise trade. These activities contribute in various ways to the district's economy.

4.6.1 Agriculture

The main activities are crop production, livestock rearing and fishing. Agriculture is one of the major economic activities of households in the district. Major crops produced include paddy, sweet potato, cassava, yam, millet and banana, different varieties of fruit and vegetables. The district is also endowed with valleys extremely suitable for paddy cultivation. There were 408 acres in the district located in valleys where paddy is grown in 2015 and the area for this production increased to 418 acres in 2016. Crop production is practiced mostly in a rain-fed environment, although efforts to develop efficient irrigation methods still continue. Most households practice a mixed farming system. The number of households that own livestock, especially cattle, has been increasing over the years. Despite, there is no indication as to whether farmers have managed to improve soil fertility through the use of animal manure which could help to increase soil fertility and, therefore, farm productivity. Table 4.7 and figure 3.5 shows the selected Shehia production of cash crops in tones where cassava is leading followed by Banana.

Table 4. 7: Magharibi B Crop Production

S/n	Shehia	Cassava	Paddy	Banana	Yam	Maize	V/vidogo	V/Vikuu	Pinneple	N/Nyasa	Peas	Kunde
1	Fumba	12	0	30	0	1	14	11	0	0	5	5
2	Bwelo	19	0	46	0	0	7	21	0	0	1	0
3	Dimani	19	0	14	0	1	32	16	0	1	0	0
4	Nyamanzi	12	0	20	0	2	0	0	0	2	0	0
5	Kombeni	32	0	20	12	2	27	13	0	1	0	0
6	Maungani	43	7	16	30	2	44	11	6	3	0	0
7	Kiobondeni	99	60	3	17	0	21	9	0	0	0	0
8	Fuoni Migombani	20	15	26	6	0	15	3	3	0	0	0
9	Pangawe	3	10	20	0	1	4	1	0	0	0	0
10	Muembe Majogoo	10	3	11	0	0	3	0	0	0	0	0
11	Kununi	10	3	11	0	0	3	0	0	0	0	0
12	Kisauni	15	18	24	12	1	11	0	6	1	2	0
13	Chukwani	17	0	19	0	1	36	0	3	0	0	0
14	Shakani	42	0	44	12	2	19	21	0	2	1	0
	Total	**353**	**116**	**304**	**89**	**13**	**236**	**106**	**18**	**10**	**9**	**5**

Source: Mgaharibi B Social Economic Profile, 2017

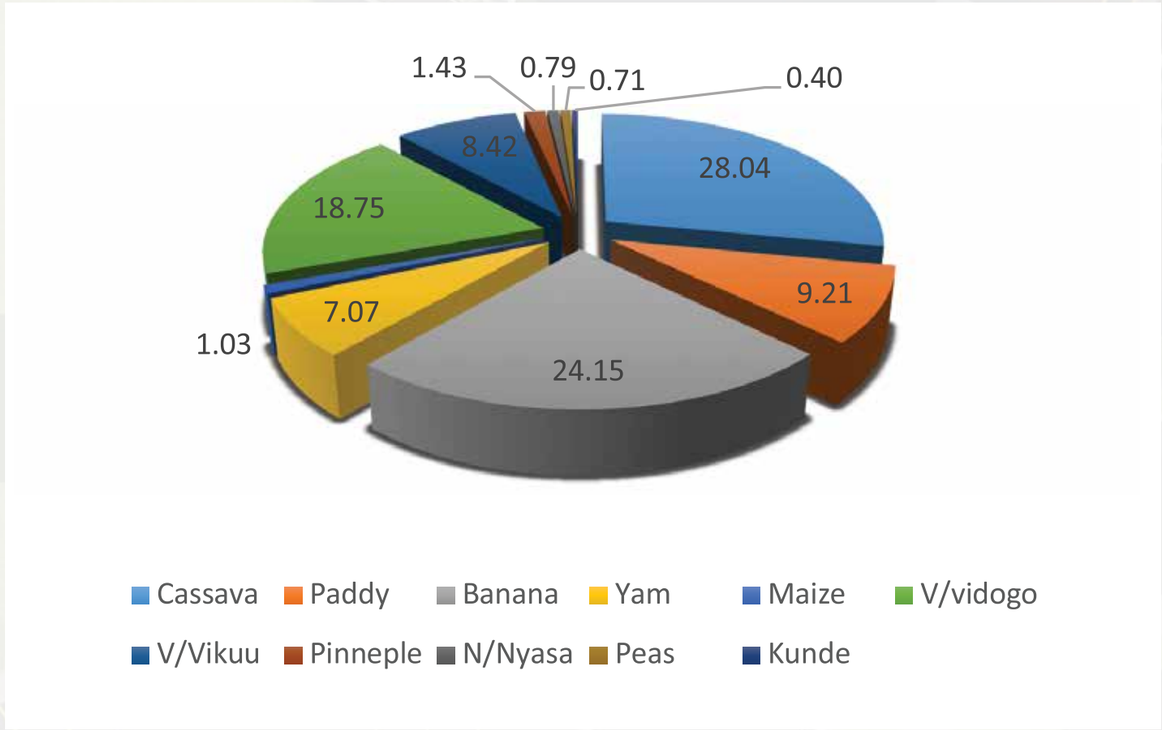


Figure 4. 4: Share of Crop Production

Source: Consultant computation from Social economic profile, 2017

4.6.2 Fisheries

Fishery is another sector that provides employment to the district's residents. The district has a total of nine official recognised landsite. The distribution of these sites has considered almost all areas/shehia of the district which are bordered by Indian Ocean. Table 4.8 gives details about designated landing sites and the corresponding number of vessels and fishermen in each area. Only 7 out of 34 Shehias in the district have fishing sites. The lone fish farm in shehia Nyamanzi is privately owned.

Table 4. 8:Land site (madiko), fishing vessels and fishermen

S/n	Shehia	Land Site	Outrigger	Boat	Dhow	Canoe	Vibori	Total	Fishermen	Cucumber Farming Site
1	Fumba	Fumba	10	17	10	6	3	46	184	0
2	Bweleo	Bweleo	7	8	9	5	3	32	110	0
3	Dimani	Dimani	40	2	0	0	2	44	134	0
4	Nyamanzi	Kiovya	20	15	5	4	2	46	140	2
5	Kombeni	Kisakasaka	3	5	5	15	2	30	68	1
6	Chukwani	Buyu	5	17	15	5	3	45	182	0
		Chukwani	15	12	6	20	4	57	176	0
7	K/Samaki	Mazizini	30	15	60	50	5	160	198	0
8	**Kibondeni**	**Kibondeni**	**5**	**12**	**4**	**5**	**0**	**26**	**64**	**3**
	Total		**135**	**103**	**114**	**110**	**24**	**486**	**1256**	**6**

The contribution of t seaweed industry is among the major economic activities in Zanzibar employing around 24,000 farmers whereby 80percent are women. Engagement in seaweed farming indicated that it played an important role in the coastal communities' livelihood and women's empowerment in Zanzibar as depicted in Table 4.9 in Magaribi B district there are six Shehia that produced seaweed while the remaining 28 Shehia do not farm seaweed. There are 810 seaweed farmers, producing an average of 95,100 kilograms of seaweed per month. Meanwhile Dimani is leading in production per month (28,800 kgs) followed by Nyamanzi (24,200 kgs) and Kibondeniu being the last that produces 2,500 kg per Month.

Table 4. 9 :Seaweed farmers and average production per month

S/N	Shehia	Male	Female	Total	Kg/Month
2	Dimani	0	150	150	28,800
3	Nyamanzi	0	200	200	24,200
6	Chukwani	90	150	200	20,000
1	Bweleo	15	100	115	15,600
4	Kombeni	25	85	85	4,000
5	Kibondeni	50	35	60	2,500
	Total	**180**	**720**	**810**	**95,100**

Source: Magharibi B Economic Profile, 2017

4.6.3 Tourism

Being bordered by Indian Ocean almost in every direction, the district has been at a suitable location for the hotel investors. There 24 hotels and guest house in the district. That might be influenced by the fact that not only the place is endowed with attractive beaches but also the local people are willing to support the tourism activities around their areas. Since a large part of the district is a township, hotels and guest houses are well developed, with most being located in Kiembesamaki and Chukwani shehias. In this regard Kiembesamaki have more hotels and gusts houses, six (6), followed by Chukwani with five (5) hotels and guest houses and there is only one 1 guest house in Shakani as depicted in table 4.10 below.

Table 4. 10:Distribution of hotels and guest houses in the district by Shehia.

S/N	Shehia	Hotels	Guest House	Sub Total
1	Kiembesamki	3	3	6
2	Chukwani	3	2	5
3	Kisauni	1	3	4
4	Mbweni	3	1	4
5	Kibondeni	0	3	3
6	Mwanakwerekwe	0	1	1
7	Shakani	0	1	1
	Grand Total	**10**	**14**	**24**

Source: Magharibi B Economic Profile, 2017

4.6.4 Trade and Commerce

The lifeline of Magharibi B lies in trade. The dominant types of trade include retail and wholesale outlets, hospitality industry, supermarkets and food markets. This sub-sector employs and generates income to larger population of people residing in the area. The existing trade facilities are limited relative to the increase in population, which leads to increase in demand. Thus, rising middle class demand for modern and expanded trade felicities. This calls for improvement of existing market structures and construction of more convenient shopping facilities. Table 4.11 shows number of registered business in Mangaribi B.

Table 4. 11: Number of registered business in Magharibi B District

S/N	Shehia	Ward	Registered traders
1	Fumba	Maungani	52
2	Bweleo		48
3	Dimani		94
4	Nyamanzi		66
5	Kombeni		85
6	Maungani		147
7	Uwandani	Kibondeni	57
8	Kibondeni		130
9	Fuoni Kipungani	Kipungani	93
10	Fuoni Migombani		817

11	Mambosasa	Mambosasa	496
12	Chunga		443
13	Kiembesamaki	Mbweni	70
14	Mbweni		13
15	Mombasa	Mombasa	61
16	Michungwani		3
17	Kwamchina		18
18	Chukwani	Chukwani	36
19	Shakani		10
20	Kisauni	Kisauni	52
21	Tomondo		71
22	Magogoni	Jitimai	593
23	Jitimai		557
24	Mikarafuni	Mwanakwerekwe	399
25	Mwanakwerekwe		681
26	Muembe Majogoo	Muembe Majogoo	4
27	Mnarani		2
28	Kinuni	Pangawe	30
29	Pangawe		49
30	Melinne	Melinne	37
31	Taveta		8
32	Uzi	Kijitoupele	3
33	Kijitoupele		73
	Total		**5298**

Source: Magharibi B Economic Profile, 2017

This Master Plan for Free Economic Zone will open up new areas for wide range of business investments including retails, whole sales and commercial complexes.

4.7 Economic Activities in Fumba Town

There are existing both formal and informal economic activities in Fumba Free Economic Zone ranging from real estate development, Bakreasa milk processing company, fishing, tourism and agriculture.

4.7.1 Real Estate Development

As discussed in the previous Chapters, Fumba as FEZ covers an area of 3,000 Ha, and has been demarcated by the previous Land Use Master Plan into industrial park and real estate. There is also a plan for the development of infrastructure for water, electricity and road network (Kisauni - Fumba ring road). Additionally, there is a signed agreement for the PPP between Government and Bakhresa Group of Company to develop the Special Purpose Vehicle which is a company called the Fumba Bay Development Co. Ltd to develop the Fumba Commercial City. Azam Group of Company had also plan to develop the Fumba Satellite City. However, the interview conducted by the consultant with the company representatives indicated narrow chance to embark into such project.

While the first phase of implementation of Uptown Living, which started in 2016, has focused on building residential units, the second phase of construction is set to include commercial facilities, international schools, conference centers, and hotels.

Recently, Bakhresa Group of Company through Fumba Uptown Living Project constructed 600 units at Fumba while the Customized Property Solutions (CPS) constructed 1,500 units at Nyamanzi. Of the 500 units that have already been built, several have been assembled using prefabricated housing techniques, which developers boast reduces the negative environmental footprint of cement, while community gardens and eco-entrepreneurship training programs promote local involvement in the city's environment.

One of the town's main selling points is that the landscaping is based on permaculture principles or a 'whole systems' approach to design. Sloping roofs and gutters collect grey water, which is then used to water community gardens and front lawns, in which native fruits and vegetables are planted; these are either consumed by residents or sold at the local town market. Finally, the leftover organic waste is composted and used to fertilize the gardens and build topsoil. Combining technical sustainability solutions with community building initiatives, the designers of Fumba Town see themselves as change makers rather than mere real estate developers and plan to scale up and replicate this model throughout Tanzania and to other parts of Africa.

Located on the south-east part of the island, some 30 minutes from the urban center and port of Zanzibar Town, both Fumba FEZ projects are only separated by a 15-minute drive and yet their urban visions could not be further apart. Both projects, however, remain out of reach for the average Tanzanian. The villas in Bahkresa's Fumba Uptown Living are priced at US$400,000 and up. While CPS had originally planned to target middle class Tanzanians and aimed to price a 2-bedroom house for US$35,000, additional infrastructure costs have pushed prices up. Studio apartments start at US$17,900, a 2-bedroom townhouse sells for US$55,000 and a 5-bedroom seafront property costs around US$300,000. Regardless of how inaccessible these developments are to locals, the new city developers benefit from building in a free economic zone, which allows foreigners to purchase houses on a 99-year lease, guaranteed by the local investment authority. Fumba Town is the furthest along of the new city projects in Tanzania, and by May 2020, 500 units had been sold and nearly 100 residents had moved in. The massive investment in the real estate in Zanzibar resulted into the increase in GDP at current prices for the real estate rose from TZS 14.3 billion in 2000 to 320.1 TZS billion in 2019, while its share has been fluctuating from 3.6 per cent to 8.5 per cent over the stated period.

4.7.2 Industry Development

Bkaresa Group of companies has dairy plants in Fumba with an installed capacity of 150,000 lpd and it currently process 25,000 liters per day-packed in 2 sizes – Tetra Classic 200ml and Tetra brick square edge 1 liter pack. While the 200ml is supplied with hygienically packed sealed straws, the 1-liter pack comes with a unique directly injection molded cap for easy pouring. Whole milk and Low fat milk in 1 liter pack while only whole milk is in 200ml pack. It also makes flavored milk, yoghurt and other dairy products. ADPL started by using mostly imported reconstituted milk to make Azam brands of milk products before diversifying sources of raw materials to include fresh milk from the mainland and Zanzibar. It has established an out grower contract farmers who will be supplying fresh milk to the factory that creates employment in terms of forward and backward linkages

4.7.2 Mining and quarrying

The demand of sand and stones for construction purposes has increased to keep pace with the increasing population growth. In this regard some part of Fumba Free Economic Zone have been exploited especially undeveloped areas along the high tension power line and adjacent to existing roadnetwork. The community around Fumba Free Economic Zone are extracting these stones informally as a building materials. In this regard, reclamation of such land woud add cost of site development during the implementation of this Plan. Urgent need for quarrying restrictions is requied to safeguard the environment by reducing such land degradation.

4.7.3 Mariculture

The Bweleo, Fumba and Nyamanzi community mariculture groups are focusing on pearl oyster farming. The bivalves are implanted with artificial button pearls made from plastic, and hung in sacks on buoyed lines. Upon harvest the pearls that have formed (so called half-pearls, which remain attached to the shell) are used for jewellery, while the meat used for food and/or sold. The farming is based on a long-line floating system in the subtidal zone, stocked with wild-collected adult oysters (4–5) in nets (no juvenile “spat” collection). After placing a nucleus in the oysters, half pearls are formed within 9 to 12 months of rearing. The production of pearls is not regular throughout the year. As an indication, the farmers on a farm in Bweleo estimated that 400 oysters per years can be collected from the wild, while only around 200 of them are appropriate to be placed on the farm for pearl production. Pearl farming is practiced all year round, with a farming low season (only farm maintenance) during June–August (southeast monsoon “kusi”) because of limited visibility due to currents.

Pearl farming is conducted by cooperative groups. It is a part-time job, and for most of the people engaged, this is supplementary labour (less than 50% of total annual income) to other main livelihoods such as fishing, seaweed farming and sewing. Jewellery made of pearls and shells is sold in the Fumba Resource Centre and trade fairs such as exhibitions and festivals in Zanzibar and mainland Tanzania. Jewellery and unprocessed half-pearls can be sold in the local markets and rarely exhibited in trade fairs in neighbouring African countries. An indicative price of a pair of earrings made of pearls was about 18–23 USD (40,000–50,000 TZS) and of an unprocessed pearl around 9 USD (20,000 TZS) (prices for September 2015). Therefore, a production of 200 pearls per year, which enables 100 pairs of earrings to be made, would contribute if sold a maximum gross annual revenue of around 2025 USD (4.5 million TZS) per farm. Pearl farming and jewellery making, however, require substantial initial investment compared to other aquaculture activities that include processing equipment for jewellery making, bivalve collecting materials (fishing gears or spat collectors) and farm construction materials (e.g. nets, sticks).

However, the main constraints in pearl farming constitute the irregular and unreliable market (products are sold with difficulty after a long time), the lack of technical expertise to achieve high quality of pearls (surface and shape imperfections and low lustre), the insufficient farming and jewellery equipment (due to economic reasons) and difficulties to locate adult oysters. Pearl farming was also practiced for few years after its introduction in the Shehia surrounding the Free Economic Zone, but has completely ceased due to reduced interest for the aforementioned reasons.

4.8 Free Economic Zones (FEZs) as a model for economic development

A free trade zone is considered a Special Economic Zone (SEZ)which is a designated area for commercial purposes. In the said area, economic trade is free from any trade-related fees like taxes or duties. Free Trade Zones (FTZs) were the first type of free zones to have been developed. The World Bank uses the following definition: “FTZs are fenced-in, duty-free areas, offering warehousing, storage, and distribution facilities for trade, transshipment, and re-export operations.” FTZs are hubs of international trade by the very nature of their activities: transshipment, re-export, international trade, etc. They play a very important role as trade facilitators in globalization. These areas are generally located in or in the immediate vicinity of seaports (known as “free ports”) and major airports. They are also present along the main transportation axes (maritime, rail and road), along the development corridors, or in border regions.

Free trade zones are a type of special economic zones which can be regarded as an investment in industrial infrastructure and a services provider to attract and facilitate foreign investment, integrate local firms into global value chains, promote export-oriented growth and generate employment. The very first type of FTZ was created in Ireland at Shannon Airport. The airport was facing serious decline due to advances in aviation technology. The jet airliner that refueled from the airport on the transatlantic flight no longer needed to refuel in Shannon (Shoesmith, 1986). This threat meant the loss of around 1,500 jobs of people employed at the Shannon airport. Thus, the Irish government transformed the airport into a duty-free production zone (i.e. Free Trade Zone) with manufacturing facilities of close proximity offering special tax incentives. The initial objective of the establishment of the FTZ in Shannon was to save jobs and it proved successful not only in employment generation but also in the attraction of foreign business.

4.8.1 Major Features of FEZs

Special economic zones feature structural and political goals that are necessary characteristics for the way they are set up and operate. Not all zones manifest all of these features, but will display core characteristics in order to be considered a FTZ. The main structural features of a zone are (Farole, Special Economic Zones in Africa, 2011):

a) A zone is a segregated area of the national territory, governed under special legal framework providing it with a set of more liberal investment, trade and operating rules. Under this framework, a zone can be administered more efficiently than the host country.
b) Generally, a zone requires a dedicated governance structure administering the regulatory system to ensure the efficient management and that investors benefit from its operation.

c) Physical infrastructure - such as real estate, roads, electricity, water and telecommunications - to support operations of the firms within zones, is usually provided to them. Key transport infrastructure includes roads, connecting the zone to its sources and the markets as zones usually exist to host firms.

4.8.2 Reasons for establishing FEZs

Reasons for establishing FEZs, especially in 12 developing economies, are usually to achieve one or more of four broad policy objectives (FIAS, 2008)

a) **In support of a wider economic reform strategy.** FEZs are an easy approach that enables a country to develop and diversify exports. Zones are a way of reducing anti-export bias while keeping protective barriers intact
b) **To serve as "pressure valves" to alleviate growing unemployment.** The FEZ programs of Tunisia and the Dominican Republic are frequently mentioned as examples of robust, job-creating programs.
c) **As experimental laboratories for the application of new policies and approaches.** China's SEZs can serve as an example, where financial, legal, labour, and even pricing policies were introduced and tested first within the SEZs before being extended to the rest of the economy.
d) **To attract foreign direct investment.** Nearly all modern Free Trade Programs have the goal to attract foreign direct investment.

In the case of Fumba Free Economic Zone all four reasons are applicable and relevant to the type of development that would enhance and conserve the inclusive and community-based development. In particular, the development of forward and backward linkages into the real estate and tourism sectors would generate sustainable employment opportunities while attracting the type of investors interested in the recreation of high value niche products that are based on the unique brand that is Fumba – Organic, environmentally sustainable, and sensitive to community development and respect of culture.

4.8.3 Trends of FEZs Zone Development

FEZs initially started off being developed, managed and governed by governments and were located relatively remotely as zones were intended to foster regional growth. The access to regulatory privileges and incentives was tightly controlled and companies at times had to be export oriented to a certain percentage. Since 1980, however, the approach to zone development has changed fundamentally and has undergone major changes in terms of administration, ownership and many more factors. Recently with the introduction of public-private partnership concepts to foster development of zones, improvements in the cooperation of government bodies and private zone developers have been made.

Major improvements include:

a) To foster private on-site infrastructure development, governments provide off-site infrastructure including building streets, connections to energy grids, telecommunications and more.
b) Introduction of build-operate-transfer and build-own-operate concepts of off and on-site zone infrastructure with public financial support.
c) Development of better land use and ownership laws regulating and securing rights of private groups on zone land.
d) Arrangements where a private contract manager can buy a zone after meeting certain performance criteria.
e) Lease of government owned zones by private operators and contracts for private management of government zone

4.8.4 Global Patterns of FEZs

SEZs are used by more than 140 economies around the world, almost three quarters of developing economies and almost all transition economies. Their number has grown rapidly in recent years, and at least 500 more are in the pipeline. Most SEZs are multi-activity zones. Industry-specialized zones and zones focusing on innovation are concentrated in more advanced emerging markets. Most developed-country SEZs focus primarily on logistics. The use of zones by countries at different stages of industrialization shows a clear SEZ development ladder. UNCTAD's inventory for this report includes at least 5,383 SEZs in 147 economies. The economic significance and policy objective of SEZs differ substantially among economies at different levels of development. In developed economies, most SEZs are customs-free zones. Their role is to provide relief from tariffs and, more importantly, from the administrative burden of customs procedures, in order to support complex cross-border supply chains. In developing economies, in contrast, the primary aim of SEZs is generally to build, diversify and upgrade industries by attracting FDI. In fact, economies that have traditionally struggled to attract FDI show a higher propensity to adopt SEZ programmes. Excluding Small Island developing States (SIDS), where the availability of resources to build zones is limited. SEZs are found in most structurally weak economies (LDCs and landlocked developing countries (LLDCs). All but one of the transition economies operate SEZs, which, as in China, were considered instrumental in building market economies and increasing participation in international trade.

Although SEZs are widely used, a handful of economies account for the majority of them. China alone hosts over half of all SEZs in the world. Other countries with high numbers of SEZs include India, the United States and the Philippines. Zone concentration is observed at the regional level, too. Economic activity among SEZs is also relatively concentrated, with a few large zones attracting significant amounts of investment and generating a large share of exports while many others, often smaller zones, remain relatively inactive (FIAS, 2008). Nevertheless, even one or two zones can significantly affect a country's FDI and export performance. Three groups of economies have relatively low SEZ densities. Most developed economies do not have SEZs apart from free zone programmes. The business environment in these countries is considered sufficiently attractive, and many offer alternative policy schemes to facilitate trade in cross-border supply chains, such as duty drawbacks or systems of bonded warehouses. Second, economies that face particular geographical challenges– most notably, as mentioned above, SIDS – have limited resources to create zones, and their locations often make the development of export-oriented manufacturing less viable.

4.8.5 SEZs in SIDS

Reflecting the limited public resources in Small Island developing States (SIDS), SEZ programmes are found in only one third of the 28 SIDS economies, most of which run a system of free points. Given the limited potential for manufacturing, newer SEZ regimes in SIDS are seeking to attract diverse industries, especially services. To overcome the problem of limited land availability, most SEZ programmes in SIDS offer a special SEZ license or certificate that is not tied to a designated multi-user zone. In Mauritius, for example, the concept of an EPZ has never been limited to any specific geographical zone. Likewise, in Seychelles, the international trade zone license is granted to qualified companies, while the country's

fenced-in area, called the Financial Services Authority zone, and does not stipulate a special incentives regime for zone occupants, which can be domestic or foreign enterprises with or without an international trade zone license. Traditionally, the SEZ regime has been used to attract export-oriented FDI in the manufacturing sector.

The majority of SIDS economies, however, are increasingly targeting foreign investments in business process outsourcing, information and communication technology, and large-scale hotel and resort projects, as well as private and public investors for developing new zones. To comply with the World Trade Organization's rules on subsidies, some middle-income SIDS (e.g. Cabo Verde and Jamaica) are modernizing their existing EPZ-type regimes. Mauritius amended its Income Tax Act and the Freeport Act in 2018 to remove the corporate tax exemption on export of goods. SIDS economies without established SEZs are considering new schemes. Maldives, where the SEZ law was adopted in 2014, has proposed several SEZ projects, including an integrated port and EPZ, as well as an island-wide "Youth City" project to curb youth unemployment by attracting private sector investors. Vanuatu is preparing a new framework to implement a pilot FTZ project (covering 50 ha) in 2019.

Table 4. 12: Number of SEZs, by region 2019

	Total Number of SEZ	Under Development	Planned
World	5,383	474	507
Developed Economies	374	5	
Europe	105	5	
North African	262		
Developing Economies	4,772	451	502
Asia	4,046	371	419
East Asia	2,645	13	
China	2,543	13	
South East Asia	737	167	
South Asia	456	167	235
India	373	142	184
West Asia	208	24	
Africa	237	51	53
Latin America and Caribbean	486	28	24
Transitional Economies	237	18	5
Memorandum			
LDCs	173	54	140
LLDCs	146	22	37
SIDS	33	8	10

Source: UCTAD, 2019

4.9Free Economic Zone Best Practice

4.9.1 China

China is one of the most successful countries in terms of leveraging SEZs to achieve far-reaching economic transformations. It started with four zones at the initial stage to experiment with market oriented economic reforms which involves laws, regulations, taxation, land, labour, finance, customs, immigration, etc. After being successful, the zone program and relevant reforms were gradually rolled out throughout the nation in more diversified forms, and some of the zones were designed with more sophisticated agenda, such as the high-tech industrial parks. Together with the numerous industrial clusters, the SEZs have contributed significantly to national GDP, employment, exports, and attraction of FDIs. It was estimated that in recent years, SEZs at national 4 level accounted for about 22% of national GDP, 46% of FDI, and 60% of exports and generated in excess of 30 million jobs (Zeng 2010). The FTZs have also played important roles in bringing new technologies to China and in adopting modern management practices. The largest number of free zones in the world are located in China, where there are more than 900 zones and around 40 million employments. In addition, FTZs as of July, 2021 account for a significant portion of China's foreign trade and investment. Through the first seven months of 2020, Chinese FTZs contributed USD400 billion (13.5%) in foreign trade and attracted more than 3,300 new foreign enterprises, accounting for USD13.3 billion (16.8%) of foreign investment in China.

Many factors contributed to the success of China's SEZs, and in every case, the situations and factors might be different:

(i) Strong commitment and support of the government to pilot market-oriented economic reforms

(ii) Land Reforms. The government allowed SEZs to lease land to investors with an initial term of 20-50 years with the possibility of renewal. Meanwhile, a land auction system was established for all the commercial land (2002) and industrial land (2007) to ensure the efficient use of land resources (Shen and Xu 2011).

(iii) Investment incentives and institutional autonomy. To encourage firms (especially FDIs) to invest in the zones, the SEZs had in place various fiscal and non-fiscal incentives3 and preferential policies, including streamlined administrative process, sound infrastructure, rapid customs clearance, concessionary tax rates, and flexibility in hiring and firing workers, among others

(iv) Foreign Direct Investment and the Chinese diaspora: FDI and the Chinese diaspora have played important roles in the success of the SEZs by bringing capital investment, technologies, and management skills; generating learning and spillovers; and ultimately helping to build local manufacturing capacity.

(v) Technology learning, innovation, upgrading, and strong links with the domestic economy. One of the key strengths of the SEZs is that they have a high concentration of very skilled people, including many R&D personnel, especially in the HIDZs and ETDZs. As a result, they have become centers of knowledge and technology generation, adaptation, diffusion, and innovation.

(vi) Innovative cultures. In addition to institutional flexibility, the composition of people in the SEZs also helped nurture innovation and entrepreneurship. Because most SEZs were built in new areas or suburbs of cities and were open to all qualified workers, they have attracted a large number of immigrants from across the country and, later on, from overseas, who hoped for better jobs and new opportunities

(vii) Clear objectives, benchmarks, and competitions. In China, SEZs were normally set up in batches—initially four—and then the number increased rapidly. Despite the large number of these zones, most of

them have clear goals and targets in GDP growth, exports, employment, revenues, FDI generation, and the like.

(viii) Location advantages. Most SEZs in China are located in the coastal region or near major cities with a history or tradition of foreign trading or business and thus are better linked to the international market.

4.9.2 Free Economic Zone (FEZ) in Africa

Egypt Tunisia and Mauritius have the largest employment rate in their free zones. Other countries in Africa such as Kenya, Madagascar and Nigeria employ around a total of 35,000 people in their free zones (Stein, 2007). In East Africa, Kenya in 2015 set up an FTZ in Mombasa that expected to attract investments to motor vehicles, household goods, and construction materials. More recently in 2018, Djibouti with Chinese financing built a $3.5 billion FTZ that included the development of a major port aimed at servicing countries in the horn of Africa – in particular land locked Ethiopia.

Egypt

Egypt is among Africa's economic heavyweights. Although Africa is a small industrial player, accounting for only 2% of world manufacturing, Egypt is the continent's top manufacturing hub, accounting for 22% of its value added in this sector. The country's fast-growing economy has been increasingly attracting international investors, who are choosing Egypt to produce for the African continent and the Middle East. Between 2017 and 2020, Egypt attracted the highest percentage of foreign direct investment (FDI) in electronics and electrical manufacturing in Africa (21% of the total number of projects), and the second highest of knowledge-intensive ones (14%), according to the report. However, Egypt still trades little with other African economies, with only 15% of its goods exports traded on the continent. The Egyptian government has established nine free zones distributed all over the republic and supplied with facilities and essential infrastructure services such as electricity, water, sanitation, telecommunication, and natural gas necessary for the establishment and running of investment projects. The free zone locations were chosen taking into account the proximity of sea and air ports, as well as the proximity of large cities (where workers and supporting factors are available, in order to attract the investment enterprises to them). According to the Egyptian regulations, free zone companies are committed to export more than 50% of their total production. Incentives provided under the Egyptian free zone system can be outlined as follows:

a) No limitations in transferring profits and investing money.
b) The right to import and export without the need to maintain records in the Register of Importers.
c) All equipment, machinery, and transportation required for the activities thereof are exempt from customs duties and sales tax (with the exception of cars).
d) Sequestration will not be imposed administratively on the companies and establishments nor will their property and funds be distained, seized, retained in protective custody, frozen or confiscated.
e) No administrative body will interfere in pricing the companies' and establishments' products, nor in determining their profits.

Moreover, free zone projects are not subject to taxes. However, free zone companies are subject to the following financial liabilities:

1) Charges against services rendered by General Authority for Investment and Free Zones (GAFI): Free zone companies pay charges against services at an annual rate of 0.5% of the project investment costs at a minimum amount of $100 and maximum of $1,000, or its equivalent in foreign currency.

2) Financial guarantee to cover the project liabilities: Before licensing the practice of the activity, the companies should provide GAFI with a financial guarantee to cover its liabilities before GAFI either in cash or by letter of guarantee (L/G) issued by a bank registered

   - For industrial projects: 1% of the project investment costs at a minimum of $5,000 and maximum of $50,000.
   - For storage projects: 2% of the project investment costs at a minimum of $10,000 and maximum of $100,000.
   - For other projects: 1% of the project investment costs at a minimum of $10,000 and maximum of $100,000.

It should be noted that the financial guarantee will be abated by 15% in case of cash payment, provided that it does not fall below the prescribed minimum amount.

3) Annual charges:

   - For industrial projects: 1% of the cost value of manufacturing portion introduced there into or the assembly process made to them.
   - For storage projects: 1% of the commodity value upon the entry of the commodity (CIF) on their entry.
   - For service projects: 1% of total realised annual revenues to GAFI as per the accounts approved by a public accountant.

Tunisia

Tunisia has two FTZs, which were both established in 1993 in an effort to open up the domestic economy. The Bizerte Free Zone in the north is located at the crossroads of major Mediterranean shipping routes and is less than eight hours by sea from Europe. Zarzis Park in the south benefits from its proximity to the Libyan market. Libya is Tunisia's second most important trade and economic partner after the European Union, and one of the three countries with which Tunisia has a trade surplus – the others being Morocco and France. The EU records 57.9% of its trade in 2020 with Tunisia and 70.9% of Tunisia's exports went to the EU and 48.3% of Tunisia's imports came from the EU. Tunisia is the EU's 35th biggest trade partner, representing 0.5% of the EU's total trade with the world in 2020. Eventually, FDI flows remained relatively steady between 2013 and 2019, resulting in a total EU FDI stock of $ 4.74 billion in Tunisia at the end of 2019. FDI flows to Tunisia are concentrated on developing the infrastructure network, and on the textiles and clothing sectors. EU companies are the biggest foreign investors in Tunisia, accounting for over 85% of FDI entering the country, and the biggest employers, responsible for 81% of the total employment generated by FDI.

In addition to providing a strategic geographical position and proximity to major oil and gas resources, the Parks offer several investment incentives, namely:

- Freedom in foreign trade and foreign exchange,
- Flexibility in employment.

Tax and financial incentives: -

a) Income tax rate reduced to 10% for totally exporting companies,
b) Total exemption from VAT and customs duties on inputs of products to be re-exported,
c) Total exemption of profits for up to 10 years granted to companies located in regional development zones and a reduced rate of 10% after the exemption period,
d) Allowance of up to 30% of the investment cost capped at $1.04M for companies located in regional development areas
e) Allowances for intangible investment and research and development expenditure of up to 50% of costs, respectively capped at $ 173,822 and $104,294.
f) Investment allowance of 15% of investment cost capped at $ 347,645 under the schemes of priority areas and economic sectors,
g) State subsidy of employer's contribution to the statutory social security schemes during the first 3 years of actual activity of employees of Tunisian nationality for their first recruitment on a permanent basis,
h) State subsidy of training expenditures leading to certification of skills representing up to 70% of the cost of initial training and capped at $ 6,953

Mauritius

The Mauritius SEZ was set up in 1970, and has become one of the country's biggest centres of employment, particularly in clothing manufacture. The SEZ is meant for manufacturers and food processors who export 100% of their output, although permission is sometimes available for 10-20% of output to be sold locally. In Mauritius, the SEZ sector—and, by extension, the textiles and clothing sector—has been a significant contributor to the agrarian diversification of the economy, with the emergence and growth of the manufacturing industry in Mauritius. According to Joomun (2006), between 1990 and 2000, the textile and clothing sector has been at the heart of the economic success of Mauritian SEZs and the SEZ sector has contributed around 12 per cent to the country's gross domestic product (GDP). World Bank study by Staritz (2011). Clothing exports from Sub-Saharan Africa to the European Union are largely dominated by Mauritius and the country remains among the top five Sub-Saharan African clothing exporters to the United States. The SEZ programme has aided in reducing the long-standing high rate of unemployment and was responsible for the industrialization and successful integration of firms into the Global Clothing Value Chains (GCVCs).

In addition, with FTZ Mauritius managed to construct Ebene Cybercity which is one of the most successful Business Parks of Mauritius that aimed at transforming Mauritius into a Cyber Island. Originally designed to attract companies operating in the ICT sector, it is now also home to the Financial Services Commission, several banks, and offshore companies, accounting and consulting firms. All the plots of land in Ebene Cybercity have been snapped up by private promoters and as at today over 45 office blocks, that provide jobs for more than 30,000 people, have been constructed. The construction of Ebene Cybercity began in November 2001, with the suburb being promoted as a new information technology hub for Mauritius and as a link between African and Asian markets. The aim being to create a Hi-tech office area in order to dynamise the country. Within a record time of 18 months, the iconic Cyber Tower One, a building of 44,000 square meters on 12 floors, emerged and the first occupants moved in from 2004. The Cyber tower 1 was voted Intelligent Building 2005 by the Intelligent Community Forum of New York. This award propelled Mauritius to a higher level of technology-led businesses and Ebene Cyber City rapidly became the reference place for IT Software development and high-end IT enabled services

Incentives Offered are

a) No customs duties or sales taxes payable on raw materials and equipment
b) No corporate taxes payable and no withholding tax on dividends;
c) No capital gains tax
d) Free repatriation of dividends, profits and capital;
e) 60% remission of customs duties on buses for personnel transport;
f) 50% reduction in registration fees payable on land and buildings;
g) Relief on personal income tax for two expatriate staff.

With this snapshot, there are number of successful FTZ's I which their record globally is still patchy mainly due to the different reasons for setting them up. In particular, those zones that were set up mainly to fulfill political interests have not been successful and have been a burden to taxpayers. What is critical is that an FTZ must be set up to exploit the unique comparative advantage that a particular location might have that others in the region don't have. Consequently, it is important that the Fumba FTZ maximizes the advantages of its location in Unguja. This chapter will outline the opportunities identified that tap into the comparative advantage that Unguja and Magharibi B region can exploit to deliver sustainable growth, job creation, exports, enhanced livelihoods and development.

4.10 General Incentive structure of FTZs

Although FTZs may be designed and created for different reasons and, as a result, the characteristics that define the concept have been described in many different ways, it appears that a few common characteristics are standard features of the modern FTZs. An example is the incentives generally provided by governments for cooperation within the zone that may include;

a) **fiscal incentives –** exemption from some or all export taxes, duties on imports of raw materials/ intermediate goods, profit taxes, VAT, free profit repatriation; direct subsidies like water and electricity rates;
b) **indirect subsidies** - like grants for training and education, free provision of physical infrastructure, transport, telecommunication, production space, residential and commercial facilities;
c) **administrative services –** fast track customs services; simplified licensing procedures; dedicated legal framework; relaxed regulatory environment - easy foreign ownership procedures, leasing and purchasing land, labour law and environment regulations;
d) **Export promotion services -** in the form of business advisory services, export credit services, sales and marketing support

4.11 FTZ Incentive structure for Zanzibar and Pemba

In the case of FTZ's in Zanzibar and Pemba the RGZ offers the following incentives to attract investments to the FTZs on both islands. These include;

- 10 – Year Corporate Tax Holiday and 25% Tax for the subsequent ten years.
- 10 – Year Withholding Tax Holiday on dividend to non-residents.
- 75% Duty and VAT Exemption on raw materials, machinery, equipment and other inputs.
- Stamp Duty Exemption.

i. 100% investment deduction on capital expenditure within 20 years.

ii. Exemption from tax on dividend for ten years.

iii. Duty and Tax Free Import of goods from domestic tariff area permissible.

iv. Duty Free import of material for construction of factory buildings.

v. Duty Free export of goods produced.

vi. Exemption of Income Tax on interest on borrowed capital.

vii. Exemption from payment of all taxes and levies imposed by local government authorities for goods and services produced in a Free Economic Zones.

viii. On site customs inspection of goods in lieu of off-port inspection.

4.12 Genaral Economic Advantages for Development of Fumba Town Mater Plan

(i) Offer formal trading premise petty traders
(ii) Increase employment opportunities (forward and backward linkages)
(iii) Expand financial flows to Zanzibar
(iv) Decongest the Zanzibar city
(v) Will attracts other social services providers such as banks, logistic companies, hospitals etc.
(vi) Business formalization
(vii) Incerase the flow goods from and to the city
(viii) Boost the agricultural production to the surrounding districts and regions
(ix) Incrase in exports of srvices and tourism products
(x) Branding of Zanzibar

4.13 Prospective opportunities catalyzed by the FTZ and Blue Economy

The Fumba FEZ has the potential to enhance the development of the island of Unguja and in particular Magharibi B region. Discussions with ZIPA and consultations with keys stakeholders in the public and private sectors as well as different policy document reviews have provided useful insights into the make-up of the local economy and how the FEZ will help stimulate a number of sectors / economic activities including blue economy. Among of the reviewed policy documents are ZDV2050 together with Zanzibar Blue Economy policy, 2020 that provides strategic direction to fully explore the blue economy in Zanzibar. Given its small in land area, Zanzibar has a vast area covered by the Indian Ocean, both in its territorial waters as well as its Exclusive Economic Zone (EEZ). This represents a major comparative advantage in the cross-cutting blue economy sector, including in maritime trade and transportation, fisheries development (as a seafood hub and for industrialisation), further tourism development, resource extraction, including oil and gas (O&G) and R&D. Though interventions in marine-related sub-sectors of Zanzibar's economy have consistently taken place, this blue side of the economy is currently under-exploited and haphazardly developed. Presently, Zanzibar has developed the Blue Economy Policy (2020) to formalize blue development as a growth generator for the next decade in the context of employment generation and poverty reduction. This policy defines the scope of the blue economy under four key areas, namely fisheries and aquaculture; marine trade; sustainable marine tourism and energy, comprising renewable energy (RE) and O&G. It also outlines the institutional framework, calling for a coordinating institution within the RGoZ to oversee blue economy-related undertakings. The blue economy policy is consistent with ZDV 2050 that requires:

(a) A cohesive blue economy captured through sectoral linkages across agriculture (1.1), industrialization and trade (1.2), tourism (1.3) and maritime transportation (3.3) as follows:

(i) ndustrial value addition, including the commercialisation of fisheries and aquaculture, in line with domestic and export market demand,
(ii) Expansion of sustainable marine tourism to include undeveloped markets for ecotourism7 to promote job creation,
(iii) Efficient and reliable maritime infrastructure network and services, including seaports and undersea pipelines, to facilitate trade and passenger flows as well as strengthening tourism demand;

(b) High expertise in managing blue economy-related technologies through capacity building and investment in R&D to ensure local ownership and greater contribution to the general economy;
(c) Sustainable exploitation of marine-related resources and products within an operational blue economy framework guided by marine spatial planning, environmental preservation and clear investment procedures; and
(d) Continued adherence to and support for regional and international blue economy institutions and initiatives in order to preserve the marine environment and promote economic cooperation.

4.14 Key planning issues in the economic analysis of Zanzibar

It is clearly noted that Zanzibar retains significant advantages in both the international and regional tourism markets. The Potentials in the Blue Economy have not yet fully utilized to hasten economic growth. There are also many gaps in infrastructural facilities, reliable and efficient transport services, value addition in locally produced products in agricultural sector and support services which constrain development of the sector and spin-offs to the wider economy. Fishing industry is also not promising as currently the fishing is largely done by traditional fishing gears just for local consumptions. In view of the blue economy as envisaged by the Vision 2050, the fishing industry should be expanded through engagement in deep sea fishing for large scale production and export to neighboring countries in the regions such as EAC, COMESA, SADEC to mention a few.

There is also need to make Fumba Free Economic Zone one of the regional and international centres for service industries and technology; for instance establishing the centre for MICE, offshore financial centre, cyber city, real estate, hospitality, sport centre to mention a few. This Master plan will address such aforementioned gaps.

EXISTING INFRASTRUCTURE

CHAPTER FIVE

EXISTING INFRASTRUCTURE

5.1 Water Supply System at District Level

Safe and readily available water is crucial for public health and live sustenance. Improved water supply and management of water resources can boost national economic growth and significantly reduce poverty. It is widely accepted that everyone has the right to sufficient, continuous, safe, physically accessible and affordable water for personal and domestic use. This section will focus on water supply in Magharibi B District where the Fumba Free Economic Zone is situated highlighting existing situation of water supply and accessibility. The section will also provide an overview of water supply at ***Shehia*** level and emerging challenges.

According to Magharibi B District Profile (2017), the level of connection to water supply in ***Magaharibi*** B district is relatively low. Thirty-three (33) out of the 34 ***Shehias*** have water pipe connections, which is equivalent to 97% of ***Shehias***. However, only 23% of houses in the district are connected to water pipes. The statistics given do not provide complete information on accessibility to water supply within the district due to the fact that the data do not include households with their own boreholes. The district produces 23,980,186 m3 while the estimated demand is 38,271,258 m3, therefore the district has a deficit of 37.3%. The water supply status specifically for Fumba shehias is shown in Table 5.1 which provides information on the households connected to water supply service.

Table 5. 1: Households connected to water supply

S/N.	Shehias	No. of houses	No. of houses connected to water	Percentages
1	Fumba	414	82	19.8%
2	Bweleo	259	21	8.8%
3	Dimani	633	144	22.74%
4	Nyamanzi	330		

Source: Magharibi B District Profile (2016).

5.2 Water Supply System in Fumba Free Economic Zone

Fumba consists of four ***Shehias*** namely Nyamanzi, Demani Bweleo and Fumba and the special economic zone. Water supply service in Fumba area differ among shehias and private entities. The well-established private investors in Fumba are Bakresa Group and CPS, both investing in real estate in Fumba Free Economic Zone, with other envisaged investors, the improvement of water supply is necessary intervention to facilitate investments in the free economic zone. ZAWA has a water supply scheme for community service in all four shehias from Dimani water sources but the service was reported to be unreliable.

5.2.1 Water sources

According to Magharibi B District Profile (2017), the main sources of water used by ZAWA water supply scheme for Fumaba area are located in Dimani which include a borehole drilled by the Chinese company with yield of 60m3/h (1440m3/day) and Dimani cave (Chomoani cave) with yield of 100 m3/h (2400m3/day). Other sources used by Fumba community include wells, boreholes and caves located in specific Shalias. Map 5.1 shows the location of main sources of water in Fumba and the storage tanks while Plate 5.1 shows the main sources of water for Fumba Free Economic Zone.

Map 5. 1: Existing Water Sources and Storage Tanks in Fumba Free Economic Zone

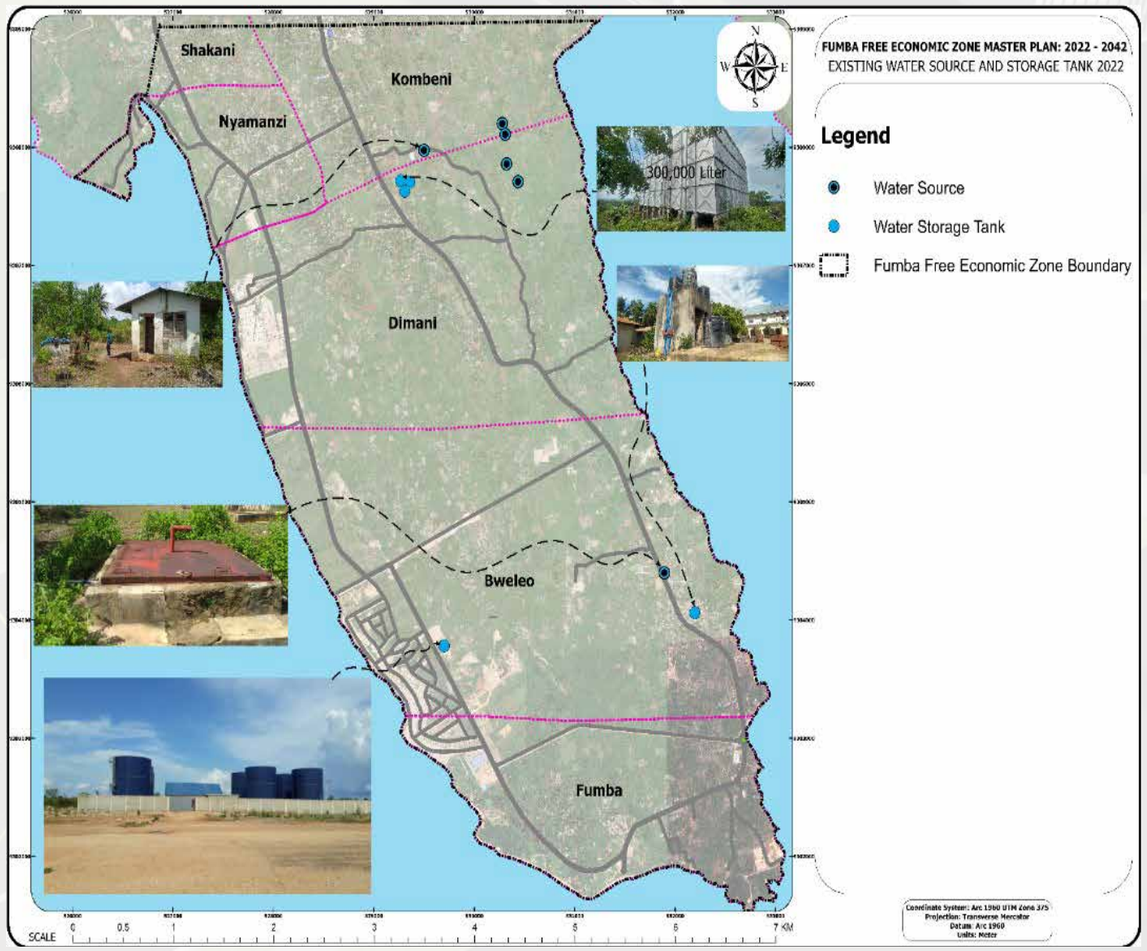


Plate 5. 1: Cave used as a source of water yields 100m³/h

Plate 5. 2: Borehole which yields of 60m³/h

Plate 5. 4: Water main and appurtenances from Dimani sources to Fumba area

5.2.2 Water storage facilities

Water from the two major sources is pumped to storage tank of 300,000 litres (Plate 5.3) located at Dimani which is the highest point in Fumba Free Economic Zone from which is supplied by gravity to Dimani, Kombeni, Fumba and Nyamanzi. The storage capacity does not suffice the demand as such water is supplied by rationing method among the four Shelias. Access to water differ among the four shehias based on the availability of water sources in the specific shalia other than the ZAWA water supply scheme are detailed bellow.

Plate 5. 3: The storage tank of 300,000 litres located in Dimani

5.2.3 Water transmission from Dimani to Fumba Free Economic Zone

The transmission main exists which transmits water from the storage tank to Fumba Free Economic Zone area. A stated earlier on water is supplied by rationing method due low storage capcity. The tank has three pipes which distribute to four Shehias. Dimani and Fumba receive water from independent pipes while Kombeni and Nyamanzi share the same pipe. Despite the fact the water distribution system exists, the map for water distribution system was not available which makes it vulnerable to unintended damages during construction of other infrastructures. Apart from damages, it also causes unformed decision during land use planning and infrastructures development. Therefore, mapping of the water supply network needs to be taken as an argent issue as Fumba Free Economic Zone becomes the prime area for housing development. Plate 5.4 shows parts of the transmission main to Fumba Free Economic Zone

5.2.4 The ongoing initiatives for improvement of water supply service

The water supply authority (ZAWA), is trying hard to ensure reliable water supply in Magharibi B including Fumba Free Economic Zone. Currently there is Exim Indian Project for water supply which is still at initial construction stages. The project intents to increase the quantity of water by drilling more boreholes in Dimani, Other project components include construction reservoirs and water distribution system which will also cover Fumba.

5.3 Water supply status in each shehia

5.3.1 Water supply service in Nyamanzi shehia

Water supply service in Nyamanzi shehia is advanced as compared to other shehias of Dimani, Bweleo and Fumba due to the presence of private investor known as CPS. The shehia has estimated population of 2,209 residents as projected from the 2012 National Population Census. The main source of water for this Shehia are wells and Borehole.

Protected wells

It was stated that the Shehia has 72 wells including public and privately owned wells. It was said that the depth of wells ranges from 15-25m and are locally drilled. The cost of drilling and pump installation was said be 1,500,000 to 2,000,000 Tshs. During site visit, a public well and Nyamanzi basic education centre was covered. The well depth is 17m with a pump and elevated tank of 500 litres which supplies water to the public tapes located at the school (Plate 5.5). The tank is filled twice a day morning and evening which means that water consumption rate from this source in 10,000 litres per day on average. Water is said to be fresh and is used for drinking and other domestic activities though water quality report was not available. Water service for community members is for free and payment for water service is based on individual willingness to support the service; and this is on the basis of faith. It was said that the typologies and model of operation of other wells in the shehias are typically the same.

Plate 5. 5: Community well supplying water at Nyamanzi shehia

Borehole owned by private investor

Apart from wells, Nyamanzi residents have alternative source of water from a borehole owned by CPS. The CPS has borehole for supplying water to support construction and operational activities. As part of community service, the CPS constructed a water supply line with elevated tank of 10,000 litres for Nyamanzi community members. The tank is filled twice a day; morning and evening on daily basis which water consumption from this source to be 20,000 litres per day. Water service from this source is purely for free and therefore preferred by the majority of community members. Therefore, the overall water consumption from the two sources of Nyamanzi shehia is 30,000 litres per day.

5.3.2 Water supply in Dimani

Dimani Shehia has 800 households with a population of about 3000 people. The residents in this area get water from ZAWA water supply scheme, Muungano water supply project, wells and galleries. Water supply service from ZAWA and Muungano project is said to be unreliable since water is supplied on rationing basis. The Muungano Water Supply project consists of 5 boreholes two tanks of storage capacity of 400,000 litres and 200,000 litres and a supply line to the community. Despite the investment, the project does not supply water reliably due to various operational challenges. Furthermore, the community members get water from 5 public wells of which 2 wells have pumps and elevated tanks and the remaining 3 wells do not have pump and water is abstracted by using rope mechanism. Private individuals also have wells which also provide water supply service to the Dimani community. Water from the wells is said to be reliable. For those without access to water from wells get water from the natural galleries of which the total walking distance is approximately 30 minutes to and from the source.

5.3.3 Water supply in Bweleo Shehia

The number of households in Bweleo shehia is 371 with estimated population of 1666 people. The community is served by ZAWA supply scheme though water is reliably available from the scheme. The main sources of water in Bweleo are protected wells which supply reliable water to the community. There is one famous well known as Kisima Ng'ombe which never dries even during prolonged dry periods. It is reliable source of water for Bweleo community. It has a pump and an elevated tank of 10,000 litres as shown (Plate 5.6).

Plate 5. 6: The Ng'ombe well at Bweleo and storage tanks at Bweleo Mosque which receives water from ZAWA.

5.3.4 Water supply in Fumba Shehia

The number of households in Fumba shehia is 370 with estimated population of 1,683 people. The major source of water is ZAWA water supply scheme which was said to be unreliable. The other sources include protected wells, private borehole and caves. Majority in Fumba use protected wells and caves while others get water from Bakresa bore hole since the water supply service from ZAWA supply scheme was said to be unreliable.

5.4 Storm water drainage system

Storm water management system is a key component in protecting and enhancing the environment at the Fumba Free Economic Zone. Unattended drainage systems disrupt normal activities, cause disease and degrade the environment. Storm water management infrastructure do not exist in most of the built areas in Fumba. Only natural storm water drainage system exists which drain the area towards the Indian ocean. The need for a comprehensive plan that directs and shapes the development of storm water management systems grows along with proposed development. A clear need exists for a comprehensive Drainage Master Plan for the entire Fumba Free Economic Zone. Such a plan will be included in this Fumba Free Economic Zone Master Plan in line with land use plan.

It is recommended that the Zanzibar Road Agency should integrate drainage channels in all roads and footpaths in an acceptable urban standard for effective collection of storm water to Indian ocean or rain water storage facility. Many areas in Fumba Free economic Zone have rocks in which storm water can easily percolate underground such that the construction of storm water canals should not be paved at the bottom to allow water filtration to underground.

Storm water management techniques can vary widely and can include facilities such as retention ponds, wetlands, drainage swales, rainwater gardens, rooftop gardens, cistern barrels, or pervious pavement. These efforts are intended to serve multiple purposes such as reducing the rate of runoff, improving the quality or cleanliness of the runoff, and recycling the water back into the groundwater systems. Zanzibar development vision (2050) emphasizes on rain water harvesting therefore, the storm water master plan may also incorporate the rainwater storage facility. Rainwater harvesting from the ground surfaces should take into account the pervious land and impervious in land use as described below.

5.4.1 Pervious Land and Impervious in Land Use

In analysing storm water it's important to evaluate and quantify the pervious and impervious lands as they play greatly in determining the run-offs.

i) Pervious Land

Pervious Land surface that allows water to percolate through provide a suitable for pedestrian and or vehicular traffic, while allowing rainwater to infiltrate through the surface and into underlying layers..

ii) Impervious Land

Impervious Surfaces are manmade hard areas or surface that does not allow water to percolate through. When rain falls on these surfaces it flows faster and in greater amounts than it would have under pre-development conditions, significantly increasing runoff and decreasing infiltration and evaporation. Impervious surfaces mainly artificial structures such as pavements (roads, sidewalks, driveways and parking lots, as well as industrial areas such as airports, ports and logistics and distribution centres, all of which use considerable paved areas) that are covered by impenetrable materials such as asphalt, concrete, brick, stone and rooftops. The total coverage by impervious surfaces in an area, such as a municipality or a watershed is usually expressed as a percentage of the total land area. The percentage imperviousness, often referred to as PIMP in calculations, is an important factor when considering drainage of water. It is calculated by measuring the percentage of a catchments area which is made up of impervious surfaces such as roads, roofs and other paved surfaces.

5.5 Sanitation status in Magharibi B District

An efficient and hygienic method of human waste disposal in a dwelling is very crucial to the health and sanitary living conditions of household members. The type of sanitation systems used Magharibi B District are mainly on-site sanitation system consisting of various typologies of latrines. According Magharibi B District Profile (2017), the types of latrines include pit latrine which accounts for about 30.6% of households. On the other hand, the use of flush toilets in the district was 51% in 2014/15. The third most used toilet facility in the district is the ventilated improved pit (VIP), which accounts for 16.9%.

The hotels in Zanzibar including tourists' hotels also use onsite sanitation systems with septic tanks which are emptied when get full. The emptying service is offered by the Municipal council using its two cesspit trucks. The sanitation situation at district level reflects the real situation observed in the four Shehias of Fumba Free Economic Zone. With the current move and investment plans, Fumba Free Economic Zone will definitely transform into new city. This transformation will attract increase of human population and expansion of the built environment such as increase in hotels, academic buildings and processing industries and real estates. This calls for consideration of advanced sanitation system particularly centralized sewerage system with treatment plant which also emphasized in the Zanzibar Development vision 2050.

5.6 Solid Waste Management

Solid wastes management entails collection, transportation, treatment and safe disposal of solid materials that is discarded because it has served its purpose or is no longer useful. Improper disposal of municipal solid wastes can create unsanitary conditions, and these conditions in turn can lead to pollution of the environment and outbreaks of vector-borne disease, that is, diseases spread by rodents and insects.

5.6.1 Generation and management of solid wastes

The amount of solid waste generated in Zanzibar Town was reported to be 280 tons per day out of which 180 tons equivalent to 64.3% is collected and transported for disposal. The generation rate is reported to be 0.75kg/capita/day which is projected to be 0.9kg/capita/day by 2038. The available data shows the solid wastes collection capacity has been increasing for the three years consecutively from 39% in 2014 to 64% in 2021 (Figure 5.1). It appears that the capacity to collect solid waste between 2016 and 2020 has not improved. .

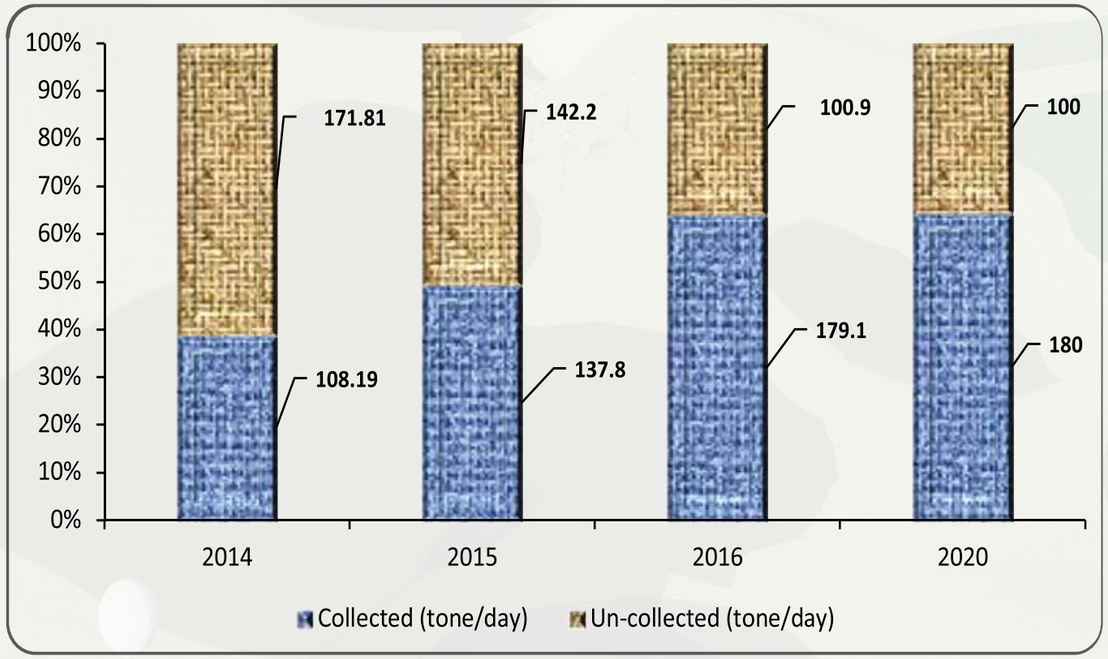


Figure 5. 1: Solid wastes collection trend between 2016 and 2020 in Zanzibar Municipal Council.

Collection of solid wastes in the municipal council is done by the municipal council through the Department of Development and Community Services. Within the urban municipal council there is door to door wastes collection service where solid wastes are collected from residential houses using push cuts are taken to the skip buckets at the communal collection points (Figure 3.8). There are 68 communal collection points in the urban municipal council with 87 skip buckets. The full skip buckets are transported by the municipal vehicles to the transfer stations at Mpendae and Maruhubi at which they are emptied into the large containers. When containers are full, they mechanically loaded into the long vehicle which transport the wastes to the Kibele landfill about 20 Km away from the Municipality. Areas outside Municipality are served by Vigor private company which is recently procured to improve solid wastes collection in Zanzibar Town.

5.6.2 Generation and management of solid wastes from hotels

Observation and responses from hotel staffs revealed that solid wastes from hotels are collected and stored at the designated areas at the hotel from which they are collected by the municipal council to the nearby communal collection point. As for residential areas, there is no sorting of wastes, instead all types of wastes fractions are mixed together. For big hotels in the rural areas, solid wastes are collected by private companies and transported to the Kibele Sanitary Land Fill for disposal. Physical observations, showed that the solid wastes from hotel is very rich in food waste (Plate 5.7).

Plate 5. 7: Solid wastes collected at one of the hotels in Zanzibar municipal council

5.6.3 Solid wastes management at Fumba Free Economic Zone

At present there is no formal solid waste management service in Fumba Free Economic Zone since is in peri-urban areas with some form of rural settings. As the area is undergoing rapid transformation, solid waste management service infrastructures should be integral part of the development plans of Fumba Free Economic Zone. All households and proposed investments in Fumba Free Economic Zone need to be served by an appropriate solid waste collection and disposal system. Thorough analysis is needed to determine if the existing Kibele landfill could be integrated for disposal of solid wastes from Fumba Free Economic Zone. In addition to solid wastes disposal, options of recycling, material recovery and composting need to be assessed and integrated in the land use planning for recycling infrastructures.

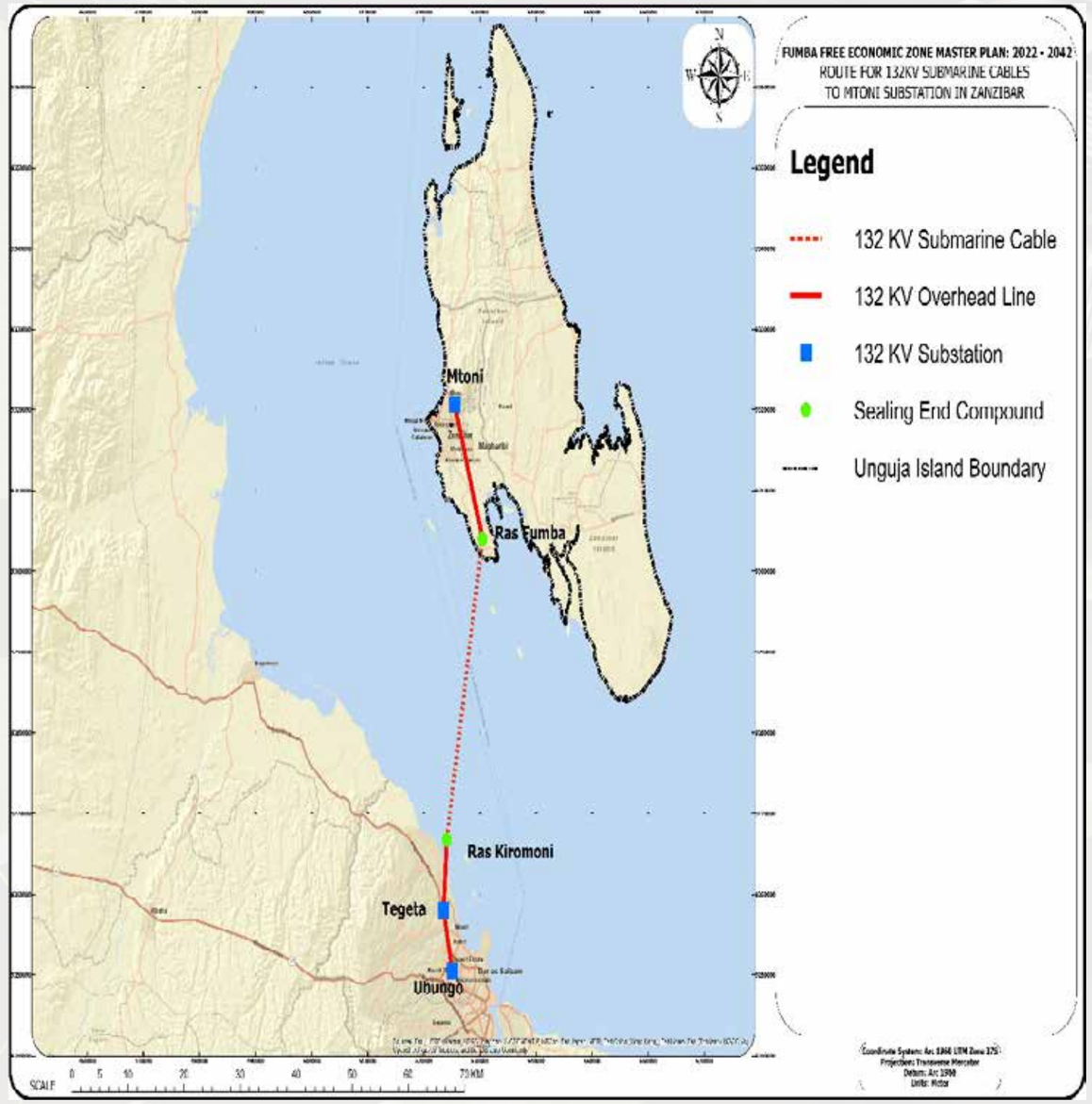
5.7 Electric Power Supply

5.7.1 Current Situation of Power Supply

In Zanzibar power supply is through Tanzania National Grid whereby the power generation is done from the Tanzania mainland under Tanzania Electric Supply Company (TANESCO). Therefore, Zanzibar dependents on power imported through submarine cables from mainland-Tanzania. Unguja imports its power from TANESCO through a 39km, 132kV submarine cable with a maximum capacity of 100MW, that was commissioned in March 2013.The new cable was constructed to replace the old 132kV (45MW) oil filled submarine cable, installed in 1980, which was reaching its limits both in terms of capacity and lifetime. The old cable had started experiencing breakdowns leading to prolonged blackouts on Unguja and causing considerable losses on the island's economy.

The new submarine was connected with capacity of 132kV 100MW which is still in use to date (Map. These submarine cables route through Fumba to MTONI where there are two substations. The Old one through 45MW ,132KV submarine and the 100MW through new 132kV,100MW submarine cable.

Map 5. 2:Route for 132kV submarine cables to MTONI Substation in Zanzibar



According to ZECO the old cable is currently energized but not loaded. This old 45MW,132kV substation can be used as a backup in case of the grid would be overloaded in near future.

Plate 5. 8: Old 45MW,132KV substation

The Fumba new transmission line 33kv have a total power consumption of 11MW maximum. The new 33kv was made under the influence of newly constructed establishment such as the Bakhresa-Uptown Living and the milk factory. The total provisional capacity for this line is 17MW.

The Fumba Old transmission line 33kv have a total power consumption of 5MW, where these comprises of old house holds power in Nyamanzi, Bweleo, Dimani and part of Fumba Town. The total provisional capacity for this line is 17MW.

With such provisional capacity, these two 33kv lines can carry extra of 18MW in case of any additional load in a mean time (Map 5.2).

Plate 5. 9: Existing 33kv Transmission line at Nyamanzi with 100KVA transformer energized

Map 5. 3: existing 33 KV Transmission Line

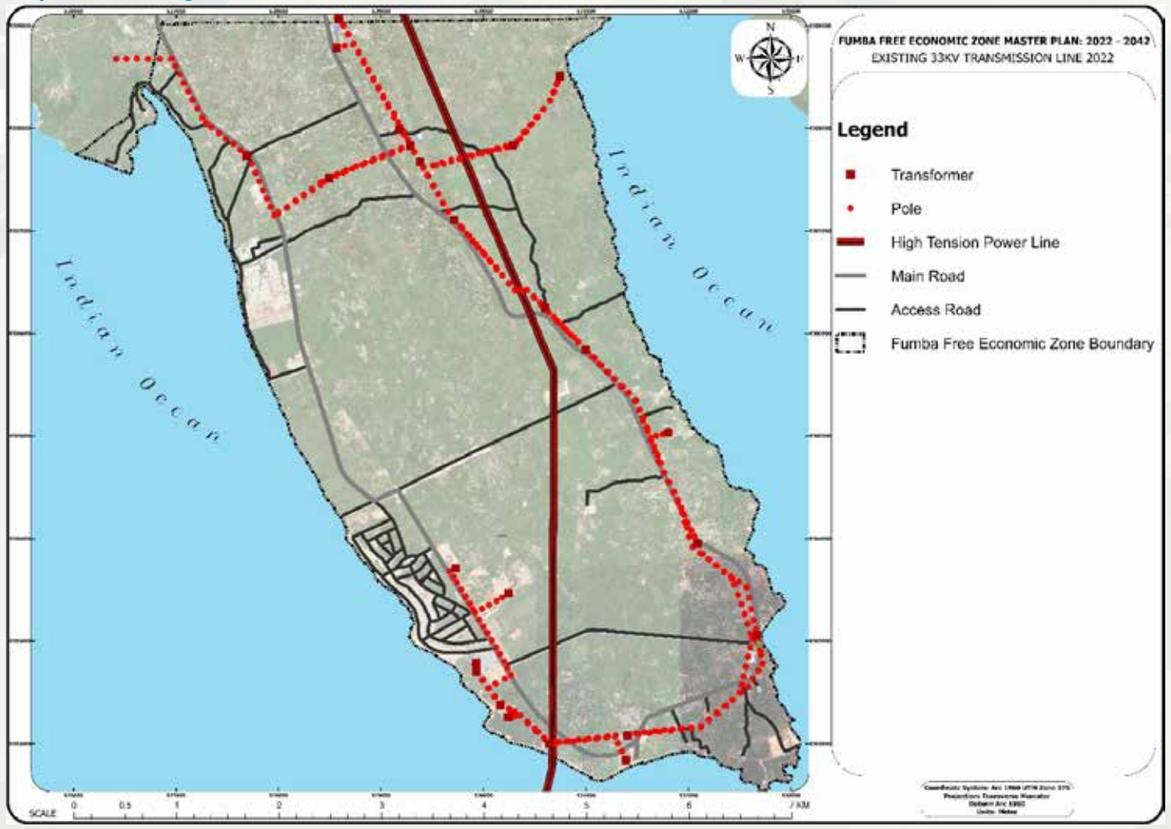


Plate 5. 10: New 100MW,132KV substation with total electric power consumption minimum 50MW to Maximum 85MW.

5.7.2 Alternative Power Sources

a) ZECO owns 25MW of grid-connected back-up diesel generator on the Island at Mtoni substation. The generator has not been adequately maintained over the years and are considered very expensive to even run as stand-by. 12.The 25MW generator is not enough to supply power for the whole Unguja incase of any outages that might occur in the grid.

b) Currently ZECO has not yet implemented any solar project. However, future plan is in place to produce 18MW at Makunduchi that will be connected into ZECO grid, the project will be implemented by World Bank fund and its under process. Most of small solar projects are privately owned by institutions and companies for their own power backup.

c) In Fumba Free Economic Zone, about 200 Ha have been set aside for an investors in Solar farm

5.7.3 Challenges of Power Supply

(i) High Electricity connection charges that lead to poor access to electricity. It is established that only 30% of households are connected with electricity. Currently, ZECO house-connection charges are about TZS300,000 (US$133) for a “no-pole” connection and increase proportionately with the number of poles needed for a connection. In recognition of this barrier, ZECO has adopted a scheme to allow customers to pay for connection fees in installments over time.

(ii) Limited alternative sources for power supply although Zanzibar has abundance sunlight almost every day throughout the year, such potential has not yet exploited. Availability of green energy source will benefit both the energy access and climate agenda, which eventually helps boost economic growth.

(iii) Frequency of power outages is high and has adverse impacts on commercial and residential consumers. The average number of unplanned outages were 93 and 54 per month in 2018 in Unguja and Pemba, respectively. Inefficiency in ZECO’s operations on power outages due to some old transformers defaults require system upgrade and improved reconfiguration.

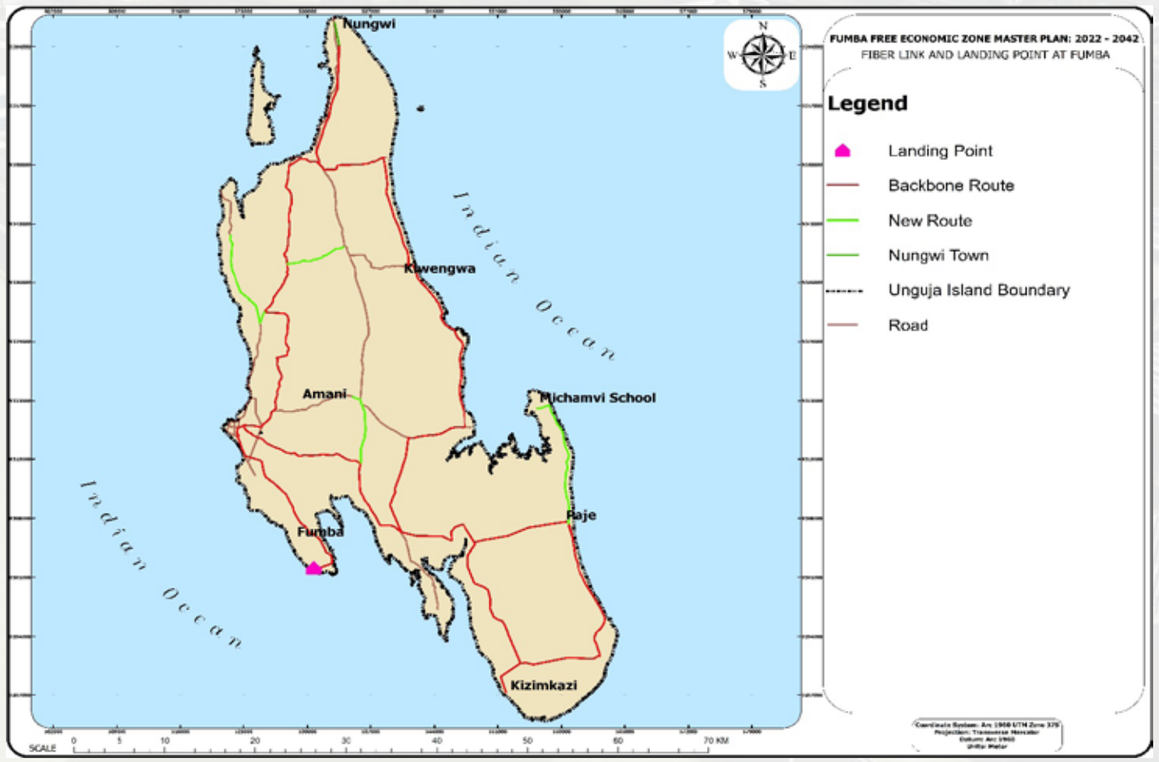
(iv) There is no independent power producers (IPP) that would supply power to the Grid as in Tanzanian mainland, there are IPP like IPTL, Songas, Aggreko, Waltsila and Dowans plus many IPPs, these assures power availability during severe breakdown.

5.8 Existing ICT Infrastructure

5.8.1 An Overview

The Information Communication Technology (ICT) in Zanzibar has internet with SEACOM submarine fibre optic cable which is extended from mainland Tanzania and this fibre connects Zanzibar with global networks. Zanlink as an ISP (Internet service provider) was the first company in using this fiber link from mainland in 2012.The cable passes through Fumba Free economic Zone from the Tanzanian mainland to Mazizini area, where there is an office for the ICT Regulatory Authority namely Zanzibar Information Communication Technology Infrastructure Authority (Map 5.4). The ZICTIA has the mandate to own and operate this fiber by building and distributing internet connectivity infrastructure to almost all main customers including government offices, telecoms service providers and other internet services providers-ISP

Map 5. 4:Fiber link landing point at Fumba.



5.8.2 Existing ICT Infrastructure in Fumba Free Economic Zone

With exception of Real Estate Development by CPS i.e Fumba Town and Bakhresa (Uptown Living) which have private security systems, there is no any security systems such as CCTV cameras along streets for the shehias and other undeveloped land in the Fumba Free Economic Zone. There are also no traffic lights that are interlinked with internet systems. Telecommunication system in these territories is available with only one telecommunication company operator which is Zantel.

5.8.3 Major challenges

Since major internet and communication infrastructure are based on the optic fibre cable laid by SEACOM. The following are few challenges facing this sector

- Internet un reliability due to human operations on areas where the cable pass through and these are farming activities tends to cut –down cables during farming activities since the cable is at small height of about 30cm deep and these was due to poor installation of optic fibre cable
- Inadequate fund from the government for installing new ICT systems in planned and unplanned maintenances of the installed ICT systems. It seems that user-fees are not in place or charged properly in public institutions. The public institutions only have to pay for the initial investment for fiber link connectivity and not perpetual fees for the internet services they use after installation.

PLANNING ISSUES, SWOT ANALYSIS, PLANNING PRINCIPLES AND PROJECTIONS

CHAPTER SIX

PLANNING ISSUES, SWOT ANALYSIS, PLANNING PRINCIPLES AND PROJECTIONS

6.1 Planning Issues

There are various issues identified in the course of analyzing existing situation of Fumba Free Economic Zone, surrounding environment and socio-economic activities taking place in existing Shehia. The following issues are planning issues that need to be addressed by ZIPA through the envisaged Fumba Free Economic Zone Master Plan 2022-2042:

6.1.1 Land Use Development Issues

- Uncontrolled and unregulated spatial expansion of existing Shehia into the Free Economic zone. Currently no physical demarcation of existing Shehia that surround Fumba Free Economic Zone (FEZ). There are six Shehias that need physical definition of their boundaries to avoid land use conflicts between Fumba Free Economic Zone and Shehia land. This will minimize encroachment into FEZ.
- Lack of land use plans for existing Shehia will affect land use development in Fumba Free Economic Zone. Planning for land use in all shehias will improve land use development in areas surrounding Free Economic Zone and avoid proliferation of informal settlements in the near future. It should be noted that the interventions that are proposed by envisaged Fumba Free Economic Zone Master Plan will attract people from down town and other districts to migrate to Fumba Free Economic Zone and surrounding Shehia. Such situation will encourage informal land subdivision and delivery to land speculators and those who want to live in New Fumba City. If the areas are not planned in advance, the consequences will be the formation of shanty urban centres, squatter settlements, land use conflicts, land degradation and environmental pollution.
- Environmental degradation in the Fumba Free Economic Zone due to illegal quarrying activities and encroachment by various land developers into Fumba Free Economic Zone.
- Although, provision of High Tension Power Line Corridor is National Power Line Infrastructure, yet it is one of the constraints of Free Economic Zone Development. It traverses the site from South to the North-East covering about 40 Ha dividing the Free Economic Zone into two separate segments.
- Rock outcrop may be both potential for construction projects and constrains when it comes to improving vegetation and urban agriculture. Readily available stones are potentials for housing and road construction including storm water drainage canals. It is therefore encouraged to use stone in housing construction especially foundations, local access roads and construction of road side channels for storm water drainage.
- Underground caves may also pose threats in residential housing development, road networks and other linear infrastructure.
- It was observed that many investors have been attracted to Fumba Free Economic Zone. However, their investments are not spatially guided and coordinated for sustainable development of the Free Economic Zone. The Fumba Free Economic Zone Master Plan is therefore, necessary to address this issue.
- The Fumba Free Economic Zone lacks comprehensive infrastructure provision to facilitate and promote existing and future investments. In the FEZ there are no clear and comprehensive circulation system, water supply network, liquid waste disposal system and Power Supply to mention a few.
- Natural caves used for ritual and other traditional activities need to be preserved
- It was observed that many investors completely clear vegetation cover prior to site development leading to disappearance of vegetation. Such kind of land development needs to be revisited and all land use developers should integrate green structure into their plan and implementation to mitigate the impacts of climate change.

6.1.2 Economic Development issues

- It is clearly noted that Zanzibar retains significant advantages in both the international and regional tourism markets. However, the are many gaps in infrastructural facilities, reliable and efficient transport services and support services constrain development of the sector and spin-offs to the wider economy.

6.1.3 Utilities

- Currently the Fumba Free Economic Zone has not provided with adequate utilities to facilitate both local and international investments. The plans for utilities provision in Fumba Free Economic Zone are also missing i.e there is no water supply network that covers the whole free economic zone site, there is no liquid waste management system for the free economic zone; storm water management for the whole site are also missing.
- Lands for linear infrastructure such as electricity, road network, water supply pipelines are not yet provided. The planned road network needs to be clearly defined and opened for various land use to be developed. This Master Plan is geared toward addressing such shortfalls.

- Water supply in the existing shehia is still a critical problem. It was observed that none of Shehias receive water in 24hrs and some of them like Bweleo does not receive water from ZAWA at all, the residents rely on their own drilled well which sometimes are not safe and clean as they are vulnerable from environmental pollution.
- High Electricity connection charges that lead to poor access to electricity. It is established that only 30% of households are connected with electricity. Currently, ZECO house-connection charges are about TZS 300,000 (US$ 133) for a “no-pole” connection and increase proportionately with the number of poles needed for a connection. In recognition of this barrier, ZECO has adopted a scheme to allow customers to pay for connection fees in installments over time.
- Limited alternative sources for power supply although Zanzibar has abundance sunlight almost every day throughout the year, such potential has not yet been exploited. Availability of green energy source will benefit both the energy access and climate agenda, which eventually helps boost economic growth.
- Frequency of power outages is high and has adverse impacts on commercial and residential consumers. The average number of unplanned outages were 93 and 54 per month in 2018 in Unguja and Pemba, respectively. Inefficiency in ZECO’s operations on power outages due to some old transformers defaults require system upgrade and improved reconfiguration.
- There is no independent power producers (IPP) that would supply power to the Grid as in Tanzanian mainland, there are IPP like IPTL, Songas, Aggreko, Waltsila and Dowans plus many IPPs, these assures power availability during severe breakdown.

6.2 SWOT Analysis

Analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT) is a tool used to analyze internal and external situation of Zanzibar where the Fumba Free Economic Zone form an integral part. It is one of the analytical tools to assess current situations in terms of strengths and weaknesses as an internal environment of Zanzibar in one hand and the opportunities as well as threats as an external environment on the other hand. Subsequently, the SWOT Analysis was used to develop strategies to address the planning issues of the Free Economic Zone.

Table 6. 1: SWOT Analysis

	HELPFUL	HARMFUL
INTERNAL FACTORS	**STRENGTHS** • Outstanding history of being a trade hub in East and Central Africa make it a regional trade node. • Zanzibar is one of the global tourist destinations • Zanzibar is known globally as a spice Island. Spices are exported to the world market eg. Cloves, cinnamon, cardamom, nutmeg, black pepper and chilies.	**WEAKNESSES** • Poor mass/public transport facilities • Limited space to improve transport infrastructure within and around the Stone Town (World Heritage Site under UNESCO) • Inadequate capacity to implement the urban transport proposals put forward by the previous plan and strategies for traffic mobility
EXTERNAL FACTORS	**OPPORTUNITIES** • Processing of spices and value addition – byproducts such as perfumes, perfumed soaps, medication and food processing. • Aquaculture products ranging from seaweed farming, fin fish and shell fish farming. • Seaweed: Value addition in seaweed such as perfumes, toothpaste, ice-cream, milk shakes and yoghurt using seaweed extracts such as carrageen, ager and alginates gelling substance, stabilizers and emulsifies. • Presence of attractive sea shore, caves and coral reefs and one of the best white sandy beaches in Africa, attract tourists and shore recreational facilities and beach hotels. • Growing number of registered tour operators to provide tourist destinations. • High population density facilitates deployment of mass transportation and equitable access to services. • Presence of stable and predictable fiscal policies that recognize the importance of the investors/companies to recover investments costs prior to the payments of co-operate tax. • Presence of Zanzibar Investment Guide which provides guidelines, investment procedures including land acquisition. It also provides threshold for investment in Zanzibar. • Establishment of Zanzibar Investment and Promotion Authorities (ZIPA) to facilitate and promote investments and aftercare services through “One Stop Centre” Mechanism. • Presence of Zanzibar Master Plan to provide potential mass transit route and nodes. • Presence of Stone Town as a World Heritage has attracted tourists across the global and calls for innovative, efficient and convenient modes of transport facilities to improve their mobility • Hierarchy of Institutional Structure to Govern Urban Development, Infrastructure and Traffic Management eg Ministry of Land, Housing, Water and Energy; Ministry of Infrastructure, Communication and Transport; Land Commission, ZIPA, ZEMA, ZAWA, ZECO and ZURA	**THREATS** • Inadequate parking facilities amid • Proliferation of informal settlements which are not coupled with transport infrastructure • Inadequate mass transit to the Airport • Poor urban transportation systems • Underutilization of marine resources • Poor bus stations for public buses

	• Presence of Zanzibar Bureau of Standards (ZBS) for quality assurance and certification, Zanzibar Development Vision 2050, Zanzibar Trade Policy (2006), Land Policy 2018, Zanzibar Investment Promotion and Protection Authority Act No. 14 of 2018 opens avenue for land development and economic growth. • Presence of Strategic Free Economic Zones at Fumba, Maruhubi Free Port Airport Free Port, and Amaani Industrial Park. • Availability of Main Credit Facilities including PBZ, CRDB, NMB and EXIM • Availability of ICT Networks • Availability of mass media network • Presence of International Airport and Zanzibar harbor with docking facilities for both passengers and cargo ships • Availability of Power: Zanzibar is connected to sub-marine electrical cable from the National Grid	
EXTERNAL FACTORS	**OPPORTUNITIES** • Indian Ocean provide potential area for Blue Economy i.e possibility for fishing in artesian and deep sea water. The presence of the ocean improves marine transportation • Tropical weather which allows different types of crops, vegetables and fruits to be grown Climate favorable to crop production, livestock and bee keeping • Zanzibar is a part of Tripartite Free Trade Area (TFTA)-Three Agreements between 3 blocs of COMESA, EAC and SADEC. It is also a part of Continental Free Trade Agreement (CFTA) under the auspices of the African Union • Presence of significant number of Tourists require descent accommodation facilities, reliable and efficient transportation facilities.	**THREATS** • Unpredictable out-break of new diseases that may render growth of economic activities and mass transit • Loss of biodiversity due to urban expansion, informal land development • Climate Change and their consequences on urban development eg unpredictable rain intensity and seasonality, high temperature and increase in sea level require resilient infrastructure and economy • Pollution due to increase in vehicular traffic create unhealthy urban environment • Underground natural caves

6.3 Planning Principles

6.3.1 Principle of Environmental Sustainability

Environmental sustainability of the Fumba Free Economic Zone can be realised by managing land use activities. Although flexibility in land use development is allowed, restriction against haphazard land use development should be considered. Undeveloped areas should be covered by vegetation to conserve the environment of the Free Economic Zone. Vegetation cover is one of the best methods to protect soil erosion. The leaves and branches of trees create a flexible screen that reduces the force of rain in the surrounding area (rainfall erosivity). It also enhances soil porosity that improves infiltration rates, hydraulic conductivity of the soils thereby reducing soil erodibility. The roots prevent soil compaction and help water soak into the ground instead of flowing over its surface. In this way, storm water will significantly be managed. Enhance use of renewable energy namely solar power and biogas from solid waste recycling to protect air pollution.

6.3.2 Principle of movement and accessibility

Free and convenient movement of pedestrians is predominantly underpinned by the so-called car-free zone. This principle provides priority to free pedestrians' movement. Therefore, walkways will be provided to allow people in the free economic zone to walk without any vehicular interference.

6.3.3 Principle of Identity

The Free Economic Zone at Fumba will have a well-articulated identity namely the core area where the centre is placed should have a land mark and an iconic view as an identity to Fumba New City. The envisaged master plan should offer strategies that link efficiently the central areas to the rest of Fumba and Zanzibar at large. The BRT forms the spine of this connectivity and the transportation node surrounded by the unique structure forms the identity of the Fumba Free Economic Zone.

6.3.4 Principle of Integration

The Fumba Free Economic Zone land use should be coordinated and integrated with transportation, ICT and Green Structure. Activity integration and coordination ensures that the proposed land uses work collaboratively and in harmony with each other and the un-built-up environment. In this way the master plan will guide and coordinate all socio-economic activities and future growth will work as a system rather than a collective fragmented entity.

6.3.5 Principle of Green and smart growth

The mixed use, compact development, pedestrian free movement, availability of alternative transportation facilities, wide range of accommodation facilities, ICT facilities, wide range of residential housing and equitable access to available facilities are among the key principles of smart city to be developed at Fumba Free Economic Zone. Green structure integrated with housing and infrastructure development will be given significant attention.

It is widely known that the smart growth is a spatial development approach which seeks to restore a time-tested forms of urbanism. It provides vitality, walkability and preserve natural environment and cultural heritage of the areas. It advocates on the compressed development with mix uses and pedestrian priority in designs. In addition, the smart growth fosters communities' sense of place, make development decisions predictable and fair.

6.3.6 Inclusive growth

The envisaged Fumba Free Economic Zone Master Plan will promote urban poor and vulnerable groups access to services and economic opportunities through providing affordable solutions and pro-poor investments. Special areas for small scale businesses for local products that reflect local contents will be designated. The plan is geared toward meeting expectations of all soci0-economic groups in the society.

6.3.7 Digital Solutions

Digital solutions are critical aspect in this era of rapid urbanizations. Mobile-enabled innovation makes basic services more affordable and more reliable to the urban inhabitants. GIS tracking facilitates safe transport and disposal of fecal sludge, geolocation of sanitation facilities and consumers, and site planning for expanding system capacity. Smart metering for energy and water services to give accuracy real-time information to service providers and consumers. Big data solution where large data sets enable better understanding of the daily activities of the urban dwellers which can facilitate evidence-based policy making, inform entrepreneurs and unlock private investment. This can be used in peak traffic management, forecasting for disaster resilience and urban expansion. Pay as you (PAYG) go solution is for more affordable services for the poor consumers as they can make micropayments; service providers improve revenue collection in low income earners settlements. The LoT/M2M connectivity is relevant in smart monitoring of system, which can increase operational efficiency in water points to ensure functionality and smart grids to reduce technical and commercial losses.

6.3.8 Principle of Security and Safety

The Fumba Free Economic Zone Master Plan should be safe, secure, and free of violence, crime, harassment, and fear of crime for all inhabitants. It deploy the Security by Design (SbD) techniques to keep the economic zone safe and secure. Entry and Exit control and restrictions in special areas should be taken into account. As such, the SbD approach builds on knowledge from physical protection; fencing and buffer zones in areas with land use incompatibility, access control, and surveillance/censoring techniques like CCTV (in door and outdoor areas), development control to minimize environmental stress and improve resilience and inclusive site design to reduce economic vunerability of the target community.

6.4 Population Projection and future land use requirements

A population projection is an important element in planning aspect. Population growth is a key determinant of future land requirements. Population projection often deals with computations of future population projection size and characteristics based on assumptions about future trends in fertility, mortality, and migration. There are also assumptions based on the pre-conditions that foster population growth in particular urban setting. For instance, envisaged interventions proposed by the Fumba Free Economic Zone Master Plan 2022-2025 influences future population of the Free Economic Zone and surrounding *Shehia.*

6.4.1 Population Projections

Population projections in the Fumba Free Economic Zone consider the population growth of the surrounding Shehia and incoming population who will be hosted in the zone. The population of existing Shehia will be grown from 20,431 in 2022 to 67,835 in 2042. The population projection of existing Shehia is shown in Table 6.2 and is projected between 2022 and 2042. While the surrounding shehia population is estimated at 67,835 inhabitants in the next 20 years, the target population for people to occupy the planned housing estate and apartments wiil be 77,000.

Table 6. 2: Population projection by Shehia

Shehia	2022	2024	2026	2028	2030	2032	2034	2036	2038	2040	2042
Kombeni	5,762	6,496	7,324	8,258	9,311	10,498	11,837	13,346	15,047	16,966	19,129
Nyamazi	2,345	2,644	2,981	2,520	3,790	4,273	4,818	5,432	6,125	6,905	7,786
Dimani	3,739	4,216	4,753	4,018	6,042	6,813	7,682	8,661	9,765	11,010	12,414
Bweleo	1,769	1,995	2,249	1,901	2,859	3,224	3,635	4,098	4,621	5,210	5,874
Fumba	1,787	2,015	2,272	1,921	2,889	3,257	3,672	4,141	4,668	5,264	5,935
Shakani	5,029	5,670	6,393	5,404	8,127	9,164	10,332	11,649	13,134	14,809	16,697
Total	**20,431**	**23,036**	**25,973**	**24,023**	**33,019**	**37,228**	**41,975**	**47,327**	**53,361**	**60,164**	**67,835**

Table 6.2 presents target population and number of dwelling units for high density, medium density and low density in Fumba ree Economic Zone.

The projection of population density is derived from the current trend of spatial development of Fumba Free Economic Zone including Real Estate Development by Customized Property Solution (CPS) to form the so called “Fumba Town” and Bakhresa (Up-Town Living) and “Mjini Magharibi Region” at large. It is estimated that when CPS site (Fumba Town) is full developed, it will accommodate about 25,000 inhabitants. As such housing estate development and apartment should take into account the overall population growthof the region, local and international market as well as existing trends of Real Housing Estate Development in Zanzibar. Figure 6.1 shows population projection of Mjini Magharibi Region

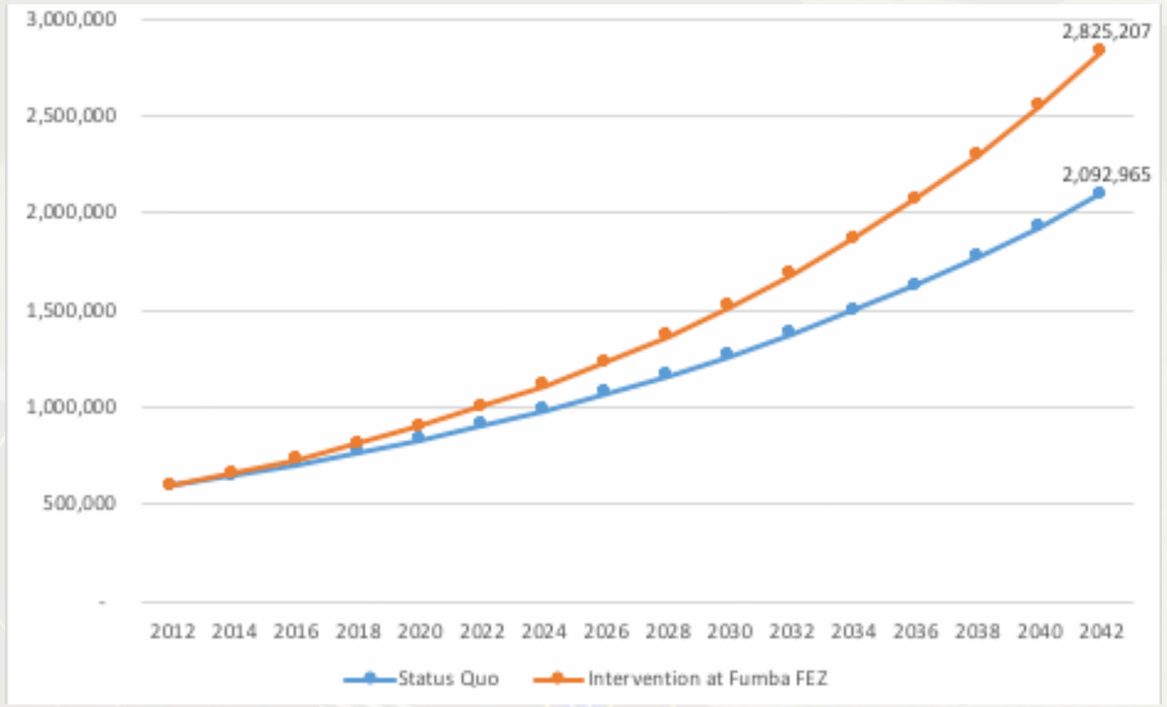


Figure 6. 1: Population Projection of Mjini Magharibi Region

Key assumptions of population growth rate

It is assumed that the envisaged smart city at Fumba Free Economic Zone will grow largely by the influence of massive investment in the Free Economic Zone (FEZ). The rapid growth of Mjini Magharibi Region where the Fumba Free Economic Zone is situated will have positive impacts on the growth of population at Fumba FEZ. The political will by the RGZ to embark into Blue Economy and open up investment opportunities in the Harbour, Airport, Dry Port and Free Economic Zones will fuel economic and population growth in Unguja and Zanzibar at large. It is therefore assumed that the population growth of Mjini Magharibi Region will be 5.2 by 2042 increased from 4.2 in 2012. Population projections under the status quo scenario and intervention in Fumba Free economic Zone are shown in Figure 6.1 above.

Many future migrants are expected to resort in the Fumba Smart City due to availability of wide range of houses, recreational facilities, commercial complexes, and infrastructural facilities. The target population of the Fumba Smart City emerged from the Fumba Free economic Zone and surrounding community is estimated at 800,000 inhabitants. Therefore, more attention should be given, to the land and environmental management as well as transportation facilities to pre-empt informal land development. This Fumba Free Economic Zone Master Plan 2022-2042 is a key tool to be used by ZIPA to manage the growth of the Fumba Free Economic Zone.

6.4.2 General Assessment of Planning Area

General assessment of planning area considered largely existing land use with specific focus on existing "shehias", developed land for government institutions and investors, undeveloped land, natural features that constrain future development and trunk infrastructure networks. Table 6.3 shows assessment parameters for spatial planning reference.

Table 6. 3: Assessment Parameters in Planning in Fumba Free Economic Zone

S/N	Planning Area		Area in hectares	Percentage (%)
1	**Land Used by Shehia**	Fumba Shehia	75.1	2.74
		Bweleo Shehia	161	5.86
		Nyamazi Shehia	163.3	5.95
		Dimani Shehia	350.9	12.78
		Kombeni Shehia	285.7	10.41
		Shakani Shehia	57.7	2.10
		Sub-total	**1093.7**	**28.49**
2	**Land used by investors and public institutions**	CPS	123.3	4.49
		Bakhresa	212.1	7.73
		Fiber Glass Factory	3.31	0.12
		Azam Dairy Milk	7.21	0.26
		Fumba Lodge	8.9	0.32
		Police Station	0.9	0.03
		Deep Sea Fishing	13.42	0.49
		Bwefumu Pr/Sec School	12.6	0.46
		KMKM	5.26	0.19
		Roads	82.21	2.99
		Sub-total	**469.21**	**10.89**
3	**Constraint Area**	Natural caves	11.82	0.43
		High Tension Power Line	42.94	1.56
		Sub-total	**54.76**	**1.26**
4	**Net-Planning Area**	**Un-developed Land**	**1127.74**	**41.08**
	Total Planning Area		**2,745.41**	**100.00**

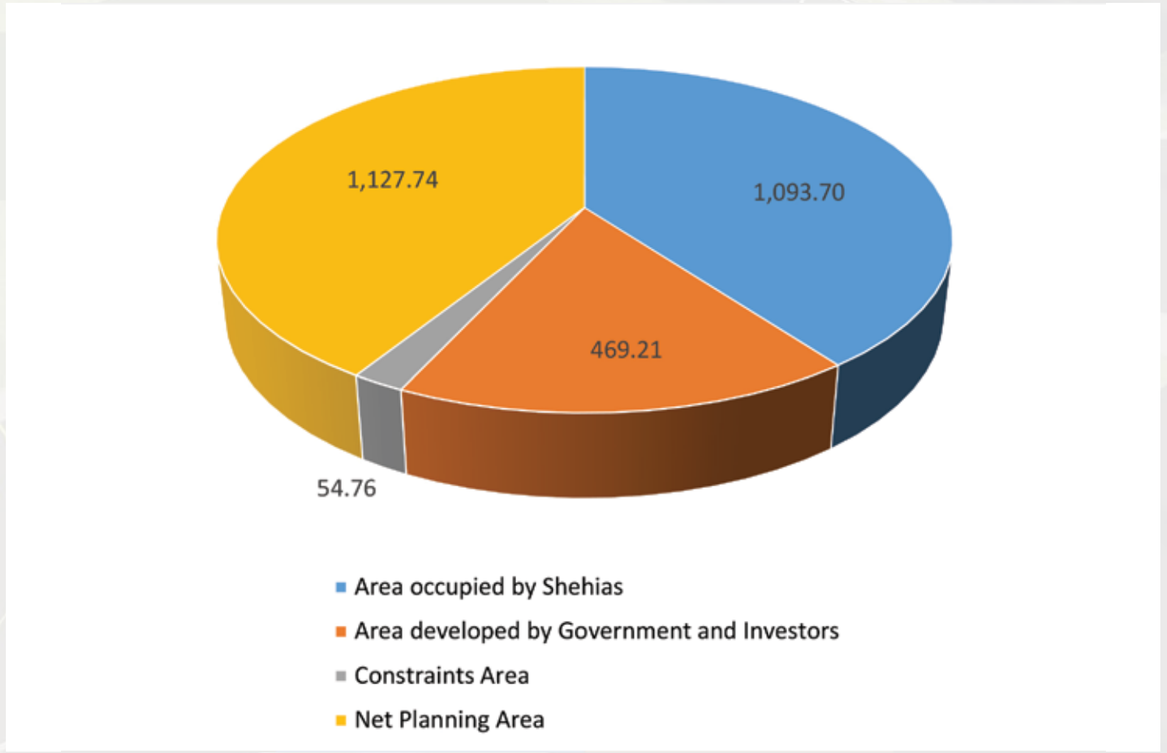


Figure 6. 2: General Assessment of Planning Area

6.4.2 Space and Planning Standards for Projected Future Land Uses for Requirements

Fumba Free economic Zone is the area for Investment Opportunities. For spatial planning purposes, the space and planning standards governing urban activities have been reviewed for the purposes of developing sizes of land use plan for the proposed investments in Fumba Free economic Zones. Major future Investments opportunities are listed in Table 6.4. Specification for Housing Estate and Apartments are shown in Table 6.5, Table 6.6 and Table 6.7. The rest of tables present the space and planning standards which also serves as a framework for space and planning standards for different investments in Fumba Free Economic Zone. They also provide development guidelines for implementing various projects in the Free Economic Zone.

Table 6. 4: Major future Investments opportunities

Functional requirements	Projected space in Hectare	Planning Standard
Cyber City	20	10-40
Offshore Financial Centre	20	5-10
Medical City	30	40
Sport City	90	20-100
University Lot Lot 1	40	40
University Lot Lot 2	40	40
Shopping Mall	3.28	1-8
MICE	8	5-10
Housing Estate and Apartments	120	-
Beach Villas	70	-
Beach hotels and lodges	70	-
Bus Terminal	2.14	2-5
Supermaket for electronics devices	3	-
Furniture Centre	1	-
Hardware Centre	1	-
Commercial zone for Food Vendors	0.5	
ZIPA Business Tower	1	0.4-0.8-
Woolworth Supermarkets	2	-
Showrooms	4	4
Zone for complex and mixed uses	34.68	-
Fire Station	0.3	0.2-0.3
Fish Market	1	-
Government City	70	-
Light Industry (micro-small scale value addition industries)	30	-
Fumba Forodhani- Central Park	3	
Natural features (Natural caves)	11	-
Deep Sea Fishing, Marine Science and Technology	13	10
Fuel and Service Station	3	0.4 per single station
Whole Sale Shops	20	-
Road Network	82.21	-
Open Space	190	270
Horticulture	10	-
Green Belt	13.01	-

Table 6. 5: Specific Standards for Housing Estate and Apartment (Real Estate)

Type	*Plot Size in peri-urban area*	*Max. No. of household*	*Max. No. of Building*	*Max. Plot coverage %*	*Max. Plot ratio*	*Max. No. of storeys*	Minimum setbacks in metre		
							front	*sides*	*rear*
Housing estate and apartment blocks	8001 – 12000m²	50	5	50	2.5	5	20	5	10

Table 6. 6: Multistoreys building

Type	*Plot Size*	*Use*	*Max. No. of Building*	*Max. Plot coverage %*	*Max. Plot ratio*	*Max. No. of storeys*	*Setbacks in Metre*		
							front	*sides*	*rear*
Low Rise (**1-5 Storey**)	2001 – 4000m²	mixed use	1	60	2.5	5	10	3	5
High Rise type 1. (6-10 Storeys)	4001 – 8000m²	mixed use	2	55	5	10	15	3	5

Table 6. 7: Minimum Planning and Space Standards for Health Facilities

Type	Plot Size	Max. No. of Buildings	Max.Plot coverage %	Max. Plot ratio	Max. No. of storeys	Setbacks in Metres		
						front	sides	rear
Dispensary/ clinic	1000–5000m²	-	60	1.5	3	10	3	5
Health centre/ MCH	0· 5–1ha	-	55	2.2	4	15	3	5
Hospital	2·5–10ha	-	55	2.5	5	15	3.5	5
District Hospital	5 – 10ha	-	45	-	5	20	7	10
Regional Hospital	5 – 10ha	-	45	-	5	20	5	7
Referral Hospital	10 - 40ha	-	40	2	5	25	7	7

Table 6. 8: Minimum Planning and Space Standards for Education Facilities

Type	Plot Size	Max. No. of Buildi-ngs	Max. Plot covera-ge %	Max. Plot ratio	Max. No. of storeys	Setbacks in Metres		
						front	sides	rear
Nursery School/Kindergarten day care Centre	1200–1800m2	3	50	0.5	1	10	3	5
Primary School	1·50–4·5 ha	-	40	1.5	3	15	5	10
Secondary School	2·5–5·0 ha	-	40	2	5	15	5	10
Polytechnic	3·0–5·0 ha	-	40	2	5	15	5	10
Education Centre	1·2–2·5 ha	-	50	2.5	5	20	5	7
Colleges /University College	5.0–10·0 ha	-	50	5	10	20	10	10
University	10·0–40·0 ha	-	50	5	10	25	10	20

Table 6. 9: Minimum Planning and Space Standards for Service Trade and Industries

Type	Plot Size	Max. No. of Buildings	Max. Plot coverage %	Max. Plot ratio	Max. No. of storeys	Setbacks in Metres		
						Front	Sides	Rear
Informal trade	2,000–80,000m²	-	6	1.2	2	15	5	5
Small Scale /service Industries	1,200 - 50,000m²	-	60	1.2	2	15	3	5
Show rooms/yards	40,000m²	-	60	3	5	15	5	7
Filling Station	400 - 1,200m²	3	60	1	2	10	5	5
Petrol and Service Station	2501 - 4000m²	3	50	1.5	2	10	5	5
Fire Station	2000 - 3000m²	3	50	1.5	2	10	5	5

- Minimum distance between Petrol stations/Filling stations along the same side of roads shall be at least 200m.
- Minimum distance between Petrol stations/Filling stations on opposite side of a roads shall be the right of way of the particular road.
- Plots for Petrol stations/Filling stations must be fenced with a strong concrete wall of a height of three meters.

Table 6. 10: Minimum Planning and Space Standards for Recreational Facilities

Type	Planning Unit	Population/ Unit	Gross area/ Person	Plot Size
Open spaces	Housing Cluster	100–150	5.0–10.0m²	500–1,500 m2
Neighbourhood Park	Neighbourhood	3,000–5,000	2.0–5.0m²	0.6–2.5 ha.
Community Recreational Park	Community	10,000–20,000	1.5–2.5m²	1.5–4.0 ha.
Recreational Park (Amusement)	Urban Centres/Town	10,000–100,000	1-2m²	10.0–20.0 ha.
Central Park	Municipality/City	100,000–1,000,000	1-2m²	20.0–100 ha.
Picnicking	250–500m2	1.0–2.0 ha.	5.0–10 ha.	10ha-15ha.
Zoo, Arboretum	0.5–1.0 ha.	2.5–5.0 ha.	10.0–15.0 ha.	50ha- 100ha
Camping	1.0–5.0 ha.	10.0–25.0 ha.	40.5–100.0 ha.	100ha-150ha
Children play area	0.2–0.4 ha.	1.0–2.0 ha.	4.0–8.0 ha.	5 - 10.0 ha.
Play fields	0.5–1.0 ha.	2.5–5.0 ha.	10.0–20.0 ha.	10 - 50.0 ha
Sports fields and Stadia	1.0–1.5 ha.	5.0–8.0 ha.	20.0–30.0 ha.	- 100.0 ha.

Table 6. 11: Minimum Planning and Space Standards for Golf Course

Course	Population/Unit	Parking	Average Length	Plot Size
9 holes	5,000–25,000	100 cars	750m	50 ha.
9 holes par 3 course	5,000–25,000	100 cars	750m	50 ha.
18 hole	25,000–50,000	200 cars	2170m	50 a.

Table 6. 12: Minimum Planning and Space Standards for Parking

Land use	Parking Ratio
Housing estate	2 per housing unit
Offices	5/500m² of total gross floor area
Commercial	5/1000m² of total gross floor area

Table 6. 13: Parking Lots

Type of car	Angle of parking	area
Buses and coaches	-	40–50m²
Car parking	a) in line parking	25–30m²
	b) in 45 degrees	20–30m²
	c) in 90 degrees	20–25m²
Lorry parking	a) in 90 degrees	90–120m²
	b) in 45 degrees	135–145m²

Table 6. 14: Minimum Planning and Space Standards for Electric Supply Substations

Type of electric supply lines in Kilowatts	Plot size (m)
33KV/11KV	30 x 40
132KV/3KV	50 x 80
220KV/132KV	100 x 100
400KV/220KV	200 x 200

Table 6. 15: Space Standards for Carriageways and Right of Ways

Type	Right of Way (metre)	Carriageway (metre)
Trunk road	80 - 120	8 - 12
Primary distributors	60 - 80	6 – 8
District distributors	30 - 60	6 - 7
Local distributors	20 - 30	5 - 6
Access Road in Housing Estate and Apartment	15.0–20.0	4 - 6
Access Road in Industrial area	15 - 20	4 - 6
Access roads in shopping streets	15 -20	10.0
Cul-de-sac.	10.0	5
Pedestrian access	5	2

Table 6. 16: Planning and Space Standards for Electricity Supply

Type of electricity supply lines in kilowatts (KV)	Right of Way in metres (ROW)	Distance from Centre Line in metres (CW)
11	5.0	2.5
33	10.0	5.0
66	20.0	10.0
132	40.0	20.0
220	60.0	30.0
400	60	30

Table 6. 17: Planning and Space Standards for Water Supply

Type of water supply pipe	Right of Way in metres (ROW)	Distance from Centre Line in metres(CN)
Trunk mains (main pipe)	15.0	7.5
Distributors	2.0	1.0
Fire Hydrants	2 km. apart	-

Table 6. 18: Planning and Space Standards for Gas/Oil supply

Type of gas/oil pipe	Right of Way in metres (ROW)	Distance from Centre line in metres(CN)
Main pipe	60	30
Main Distributors	30.0	15.0
Minor Distributor	15	7.5
Distributors	2.0	1.0

6.4.3 Estimated Number of Dwelling Units and Population Projections

Estimated number of Dwelling Units and Population Projection in Fumba Free Economic Zone is based on space and planning standards and also available space for Housing Estate and Apartments in high, medium and low density residential areas. The recommended high, medium and low densities are related to number of dwelling units and number of persons per unit area.

Table 6. 19: Recommended density category for housing estate development

S/N	Density Category for Housing Estate Development	High Density	Medium Density	Low Density
1	Minimum Average Gross Density (persons/ Ha.)	460	220	100
2	Maximum Average Gross Density (persons/ Ha.)	680	340	140
3	Minimum Average Gross Density (DU/Ha.	115	55	25
4	Maximum Average Gross Density (DU/Ha.)	170	85	35

Table 6. 20: Future Space Requirements per Dwelling Units

S/N	Gross space coverage	Space in m^2 (high density)	Medium Density Space in m^2 (medium density)	Low Density Space in m^2 (beach villa)
1	Minimum space coverage per dwelling unit	58.8	117.6	285
2	Maximum space coverage per dwelling unit	86.96	181	400

Table 6. 21: Estimated number of dwelling units and persons in residential areas for housing estate and appartments by 2042

Housing Estate and Appartments	Number of Floor and Available space in m^2	Number of Units	Population
Number of Floors	G+6	G+4	G+1
Housing Estate and Appartments for High Density	428,000	7,279	43,673
Housing Estate and Appartments for Medium Density	562,000	4,779	28,673
Housing Estate (Beach Villa)	238,400	836	5,019
Total	1,228,400	12,894	77,365

Assumptions

1. Household size stands at 6
2. Improvements of infrastructure, recreational and community facilities at Fumba Free Economic zone will attract huge amount of local and international investors as well as local residents
3. As city centre continue to congest, many people will find living options at Fumba Smart City.

SPATIAL DEVELOPMENT CONCEPTS AND PLANNING PROPOSALS

CHAPTER SEVEN

SPATIAL DEVELOPMENT CONCEPTS AND PLANNING PROPOSALS

7.1 Spatial Development Concepts of Fumba Free Economic Zone

In the course of plan preparation, various spatial development concepts are discussed and evaluated based on the context of planning area and the institutional framework governing land use planning. Plan conceptualization is, therefore, one of the critical stages conducted prior to the development of planning proposals for, in this context, Fumba Free Economic Zone. It was one of the stage in planning process where the departure from existing situation to planning proposals was made. In this stage, various concepts were described and evaluated for the purpose of selecting the most relevant development option to realize the planning goal.

Therefore, in the process of preparing this Master Plan, the spatial development concepts namely monocentric, multinucleate and radial development radial development concepts were used in an attempt to address the current and future development agenda of Fumba Free Economic Zone. The concepts were also in line with the planning principles and existing situation of the Free Economic Zone.

7.1.1 Alternative one: radial concept

A radial pattern of spatial growth is a concept frequently used in the development of urban centres. The term radial implies one dominant growth and movement pattern. In addition, there are usually secondary paths of growth. The basic organizing principle of the radial development oscillates around the central axis or space around which buildings are arranged or developed outward. The radial pattern starts with a core central place which, in the early stages, may house the whole functions of the urban settlement (Figure 7.1). Therefore, a radial concentric plan is formed by streets that extend outward from a defined center and reach the outer edge of the particular settlement, together with concentrically arranged roads that connect the radial streets to the lots.

Concentration of major part of the spatial development is along the two transportation corridor and the residential axis which has the advantage of enjoying shared facilities but will face challenges of high population density along the axis and mobility friction.

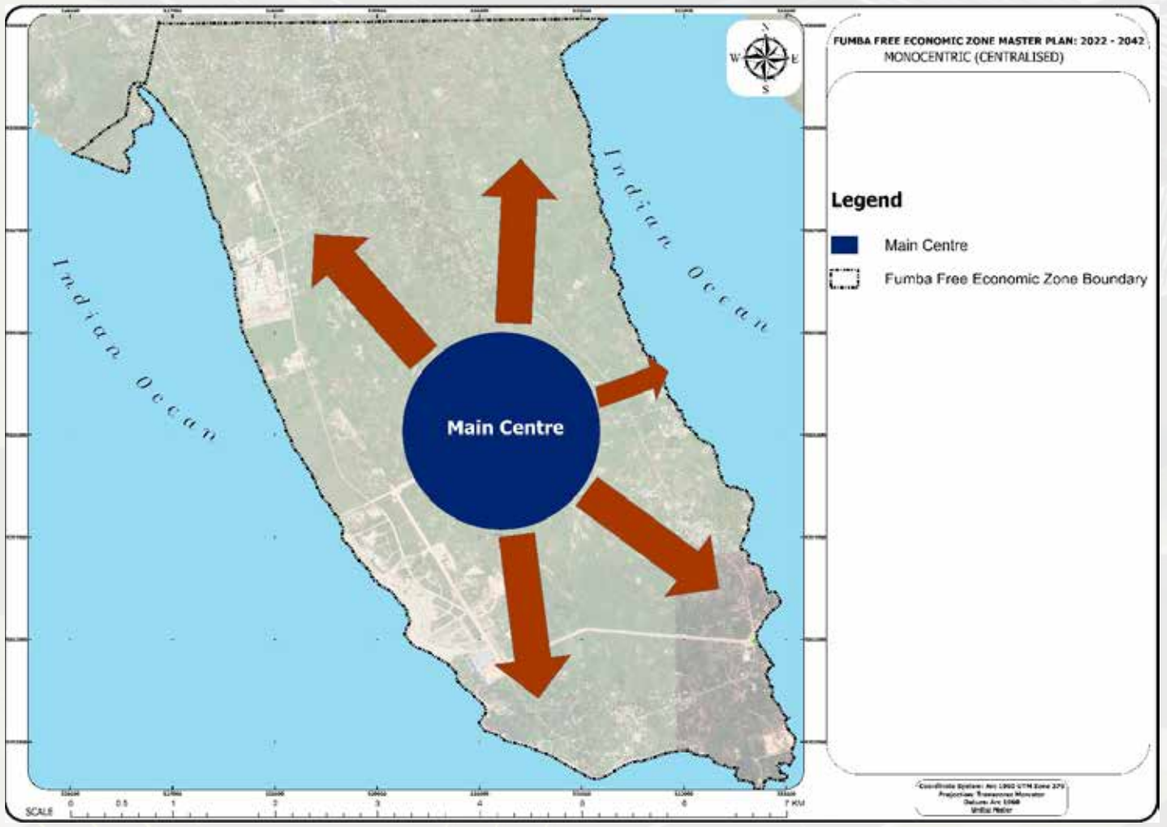


Figure 7. 2: Radial Development Concept

Source: *Consultant design 2021*

Critiques against the radial concept

Extension from this firmly established center grows along the axes (radiate from the centre) established by the central space. There is danger that this arrangement may lead to an undesirable separation of interrelated function. As the site development expands, it becomes inefficient as all additional functions will largely rely on the centre. Congestions around the central facilities become the common phenomenon.

7.1.2 Alternative 2: Multinucleate/Polycentric Development Concept

In the polycentric urban development concept of the institute campus, the spatial organization of the Fumba Free Economic Zone is broken down into more balanced components where multiple independent clusters are formed. The idea is to decentralize functions in the Fumba Free Economic Zone to enhance efficiency in service delivery. There is literally no major feature in the pattern (dominant centre dictation) The component may consist of clusters of related functions that are self-contained in terms of basic services that reflect the key features of the of free economic zone. Growth can be developed in any direction because there is no central focus to which elements have to be directly related (Figure 7.2). The clusters are connected with ring roads to enhance balanced growth and efficient circulation system.

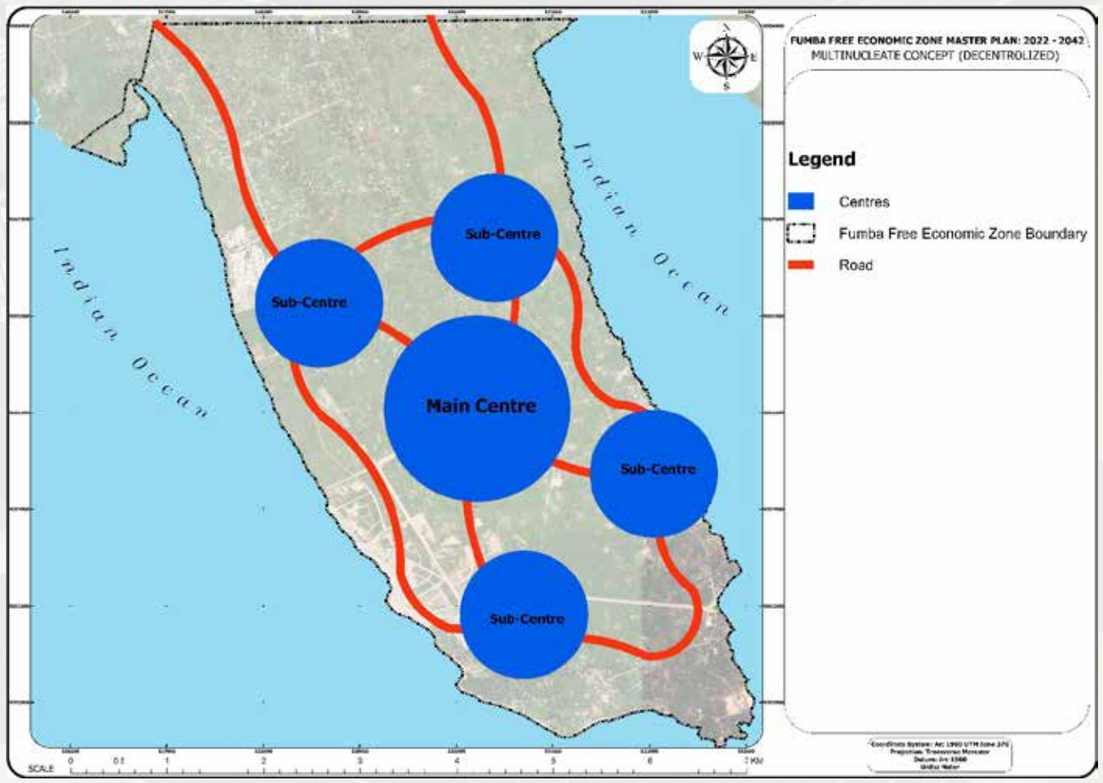


Figure 7. 3: Cluster Development Concept

Source: *Consultant design 2021*

The new development focuses on complex distribution of activities. The developed clusters are separated by green spaces, green areas or circulation system that promotes free movement of people. Such development is more resilient to natural hazards for instance natural fire break out as there are less concentration of buildings and population. However, relatively high cost of linear infrastructure provision has been one of the critiques against this concept.

7.1.3 Evaluation Criteria

The evaluation of alternative spatial development concept for the Fumba Free Economic Zone is based on the criterial presented in Table 7.1.

Table 7. 1: Concepts' Evaluation

Criteria	Radial development Concept	Polycentric development Concept
Efficiency	0.5	1
Flexibility	0	1
Compatibility	1	1
Resilience	0	1
Cost effectiveness	1	0.5
Environmental sustainability	1	1
Reflective (to existing context)	0.5	1
Promotion of Green Structure	0.5	1
Safety and security	0.5	1
Total score	**5.0**	**8.5**

Based on the evaluation criteria it was observed that the cluster development concept best fit the desired future development of the Free Economic Zone. Therefore, the cluster-oriented development, polycentric in nature, will determine the future development patterns. Such development pattern is resilient to natural disasters, safe and sustainable. It promotes green structure integration and open up areas for a wide range of investors while promoting balanced growth of the Fumba Free Economic Zone.

7.2 Planning Proposals for Land use development

Planning proposals for land use development for investments in Fumba Free Economic Zone will focus on promotion of green environment by creating a green belt and trees plantation along the circulation system. It focuses on Blue Economy (BE) on coastal areas by introducing a centre for deep sea fishing and marine science and technology where associated facilities such as ice plant, cold rooms for fish store (fish storage facilities) will be introduced. High end beach villa and housing estate, hotels and lodges have also been proposed. Fish market, marinas and sea port to integrate Fumba Free Economic Zone and the adjacent small islands have been proposed as a way to promote BE among others. Urban residential greening provides opportunities for social integration and physical exercise. Sport City (with stadium, golf course and crickets, swimming pools, volley ball, gym, indoor entertainment, table tennis, basketballs and other supporting facilities) of International Standards as well as Fumba Forodhani and Fumba Marathon Routes have been designed to promote citizens' mental health, relieving stress, and reducing obesity and violent crimes. Other investments zones include Offshore Financial Centre, Conference and Exhibition Centre, Shopping Malls, Cyber City, Medical City, areas for universities and vocational training centres, bus-terminals, fire station, police station, fuel and service stations, government city, horticulture, storm water storage facilities, car parks, housing estate and apartments, green belt, open spaces, marina, sea port and areas for mixed uses. The following sub-sections will provide in details maps and tables for the proposed land use for different investments.

To facilitate availability of different types of tree species including fruits, flowers and grasses, a lot for horticulture has been set aside for investors in this area. People will get different types of trees for planting in their areas based on their choices and recommendations. Demonstration farms for different

types of crops with high value will also be available in this lot. The horticulture will be adjacent to adjacent water storage tanks (underground storm water storage facilities) which have been proposed by this Master Plan.

Therefore, due to availability of a wide range of tree species, it is recommended that all proposed land use clusters (zones) be surrounded by trees to make the area cool, quiet and conducive for quality living. Trees provide shade and reduce sun radiation during the day as well as reduce carbon sequestration, air purification, heat island effect alleviation and storm water runoff filtration and reduction. Proposed trees for Fumba outdoor environment are mixers of fruits such as mangle trees and African baobab trees ***'Mibuyu' and other species which will be available and viable to the tropical climate***. Baobabs are low maintenance trees and regarded as world's largest succulent. The baobab tree flourishes on poor soils, tolerates heat and has the ability to store large amounts of water, to survive in drought.

Other proposed trees include cloves, ***mizambarau, mikungu***, cashew, native mangoes, jackfruits, coconut trees and neem also known as ***'Muarubaini'*** and mustard ***'Muaradali'***. These trees are natural to the coastal tropical climates and need minimum maintenance. Baobab, neem and mustard trees have large foliage that provide shade during hot sunny days, African Baobab tree can take up to 10 years to reach maturity whereas neem and mustard trees reach maturity within a year or two. Other recommended trees

Planting trees along the roads also act as buffer zone to minimize noise pollution, dust and interference with the surrounding development while enhancing environmental conservation and landscaping. hey form green corridors in residential areas and streets, thereby providing multi-dimensional benefits such as encouraging children to walk to school and people to walk and cycle. Similarly names for access roads or streets can be identified by using theme of trees, e.g. Muembeni Road, Mkunguni, Mzambarau, Muarubaini and the like.

7.2.1 Proposed Land Use Plan

Having analysed existing situation, population and land use requirements to meet the future land requirement for investments, the land use plan was prepared as shown in Map 7.1. The proposed land use zones include zones for cyber city, medical city, offshore financial, conference and exhibition centre where meetings, Incentives, Conferences, Exhibitions (MICE) are clustered. There are also land use zones proposed for sport city, real estate development where lots for housing estate and apartments, hotels and lodges, green belt, retail shops, recreational facilities, educational facilities and healthcare facilities can be established. This master plan also proposes lots for micro-small and medium industries, universities, vocational education and training centre; zone for deep sea fishing, marine sciences and technology; shopping malls, beach villa, open spaces for passive and active reactional facilities, zones for mixed uses, parking lots, outdoor and indoor entertainment centres, zone for urban agriculture (horticulture), electronic shops, Woolworths supermarkets, small scale (light) industries for value addition, ZIPA Business Tower, government city, zone for commercial complex, hardware, furniture centre, showrooms, religious facilities, zones for underground storm water storage facilities, circulation network, fuel and service station, fire hydrants, fire stations, police stations, bus-terminal, fish market, sea port and marinas. The full range of proposed land use for investments is shown in Map 7.1 and the detailed sizes of each zone are summarised in Table 7.1 for easy access to the reader and user of this Master Plan. Detailed design is presented in Figure 7.1. The 3-D Projections for various sections are presented in the Plates in the sub-sequent sections.

Map 7. 1: Proposed Land Use Plan for Investments

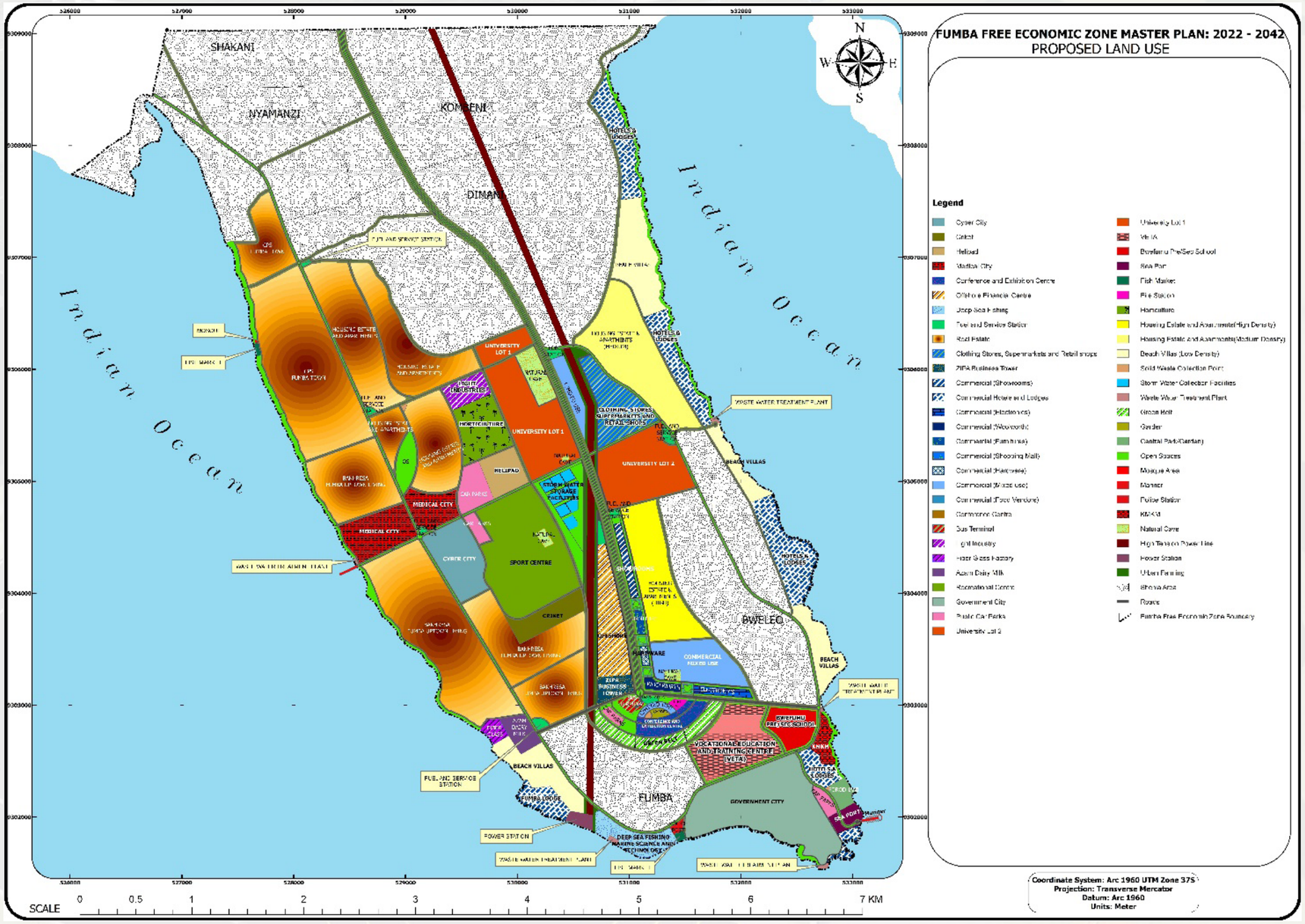


Table 7. 1: Summary of Proposed Land Use Distribution

Proposed investment zones	Area (Ha)	Area (m^2)	Percentage (%)
Beach Villas	72.54	725,400	2.64
Bus Terminal	2.14	21,400	0.08
International Conference and Exhibition Centre	9.20	92,000	0.34
Cyber City	24.50	245,000	0.89
Medical City	32.69	326,900	1.19
University Lot 1	51.23	512,300	1.87
University Lot 2	41.50	415,000	1.51
Offshore Financial Centre	24.12	241,200	0.88
Government City	70.20	702,000	2.56
Helipad	12.19	121,900	0.44
Commercial zone for Furniture	1.43	14,300	0.05
Commercial zone for Hardware	1.14	11,400	0.04
Commercial zone for Hotels and Lodges	75.17	751,700	2.74
Commercial zone for mixed use	34.68	346,800	1.26
Commercial zone for Shopping Mall	3.28	32,800	0.12
Commercial zone for Woolworth supermarket	2.41	24,100	0.09
Commercial zone for Retail Shops	23.80	238,000	0.87
Show rooms	4.52	45,200	0.16
Deep Sea Fishing Marine Science and Technology	13.42	134,200	0.49
Sea Port	4.12	41,200	0.15
Commercial zone for small scale food vendors	0.91	9,100	0.03
Fiber Glass Factory	3.31	33,100	0.12
Fire Station	1.01	10,100	0.04
Fish Market	1.02	10,200	0.04
Vocational Education Training Centre	33.80	338,000	1.23
Green Belt	13.01	130,100	0.47
Housing Estate and Apartments for High Density	42.80	428,000	1.56
Housing Estate and Apartments for Medium Density	56.28	562,800	2.05
Housing Estate and Apartments for Low Density	23.84	2.8,400	0.87
Azam Dairy Milk	7.21	72,100	0.26
KMKM	5.26	52,600	0.19
Light Industry	8.25	82,500	0.30
Religious Facilities	0.06	600	0.00
Natural caves	11.82	118,200	0.43
Open Space	187.57	1875,700	6.83
Fumba Park/Garden	3.97	39,700	0.14
Fuel and Service Station	4.37	43,700	0.16
Police Station	0.90	9,000	0.03
Power Station	2.69	269,000	0.10
Car Parking Facilities	16.64	166,400	0.61
Real Estate	456.13	456,130	16.61
Recreational Centre	78.00	780,000	2.84
Shehia Area	1093.73	10,937,300	39.84
Solid Waste Collection Point	0.71	7,100	0.03
Storm Water Collection Facility	13.49	134,900	0.49
Horticulture (trees fruits, vegetables, flowers and nursery for various species)	20.00	200,000	0.73
Garden	1.03	10,300	0.04
Urban Farming	10.97	109,700	0.40
Secondary School zone	12.60	126,000	0.46
Waste Water Treatment Plant	1.17	11,700	0.04
ZIPA Business Tower	6.02	60,200	0.22
Road network	82.21	822,100	2.99
High Tension Power Line	40.25	402,500	1.47
Total Area	**2745.41**	**27,454,100**	**100.00**

Figure 7. 1: Schematic Design of Fumba Free Economic Zone

Map 7. 2: Proposed Lots for investments

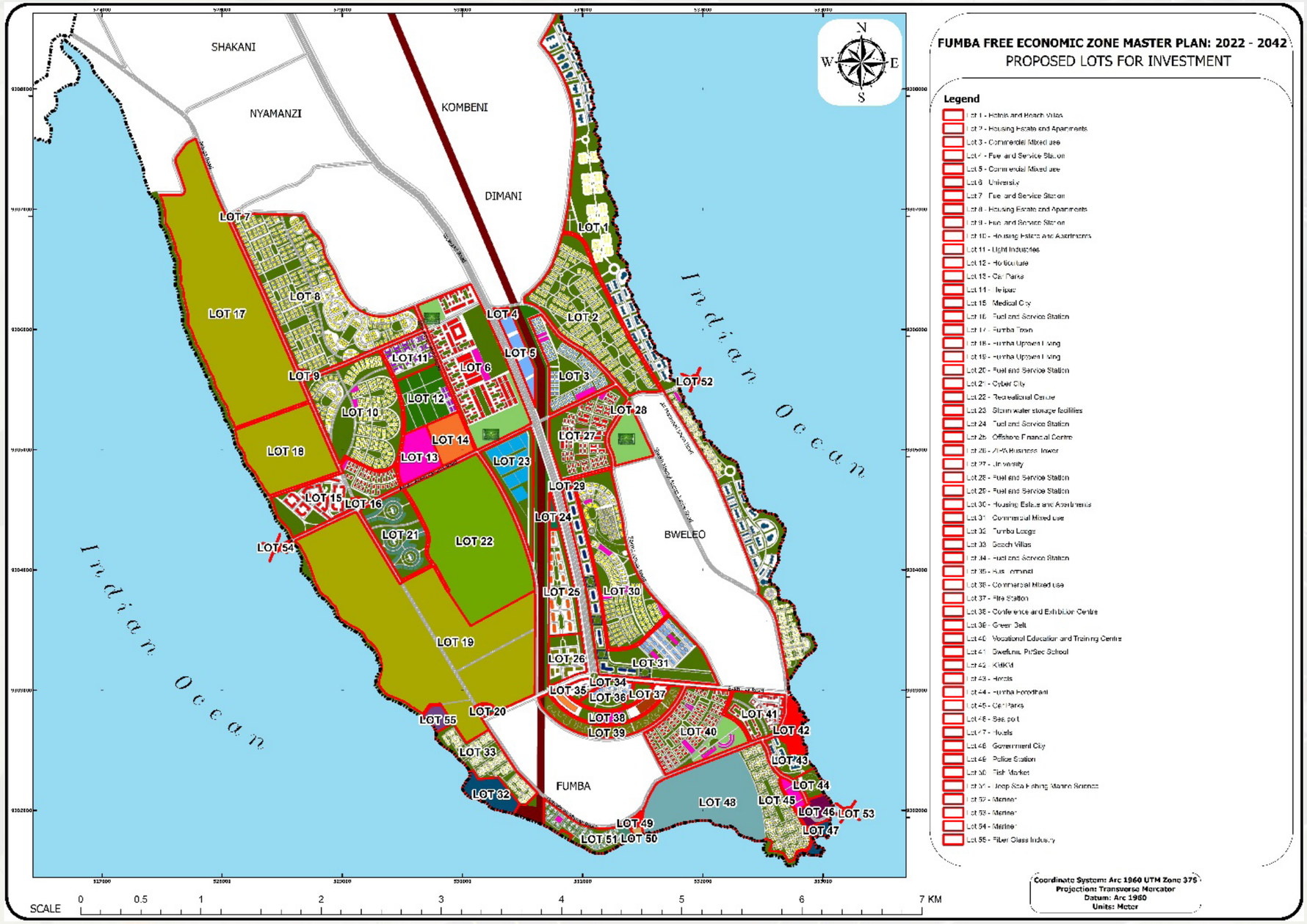


Table 7. 2: Proposed Investment Lots and size

Proposed Lots	Area (m^2)	Area (Ha)
Lot 1 - Hotels and Beach Villas	1,168,190.00	116.8
Lot 2 - Housing Estate and Apartments	562,841.00	56.3
Lot 3 - Commercial Mixed use	238,486.00	23.8
Lot 4 - Fuel and Service Station	7,728.40	0.8
Lot 5 - Commercial Mixed use	74,898.50	7.5
Lot 6 - University	645,741.00	64.6
Lot 7 - Fuel and Service Station	2,125.49	0.2
Lot 8 - Housing Estate and Apartments	927,039.00	92.7
Lot 9 - Fuel and Service Station	3,139.82	0.3
Lot 10 - Housing Estate and Apartments	541,012.00	54.1
Lot 11 - Light Industries	108,921.00	10.9
Lot 12 - Horticulture	180,069.00	18.0
Lot 13 - Car Parks	114,407.00	11.4
Lot 14 - Helipad	105,582.00	10.6
Lot 15 - Medical City	316,659.00	31.7
Lot 16 - Fuel and Service Station	2,767.51	0.3
Lot 17 - Fumba Town	1,247,390.00	124.7
Lot 18 - Fumba Uptown Living	402,689.00	40.3
Lot 19 - Fumba Uptown Living	1,703,560.00	170.4
Lot 20 - Fuel and Service Station	8,552.30	0.9
Lot 21 - Cyber City	244,427.00	24.4
Lot 22 - Recreational Centre	876,715.00	87.7
Lot 23 - Storm water storage facilities	219,509.00	22.0
Lot 24 - Fuel and Service Station	15,876.20	1.6
Lot 25 - Offshore Financial Centre	168,248.00	16.8
Lot 26 - ZIPA Business Tower	108,511.00	10.9
Lot 27 - University	407,628.00	40.8
Lot 28 - Fuel and Service Station	3,022.98	0.3
Lot 29 - Fuel and Service Station	6,013.74	0.6
Lot 30 - Housing Estate and Apartments	506,051.00	50.6
Lot 31 - Commercial Mixed use	447,850.00	44.8
Lot 32 - Fumba Lodge	88,984.10	8.9
Lot 33 - Beach Villas	199,748.00	20.0
Lot 34 - Fuel and Service Station	3,634.48	0.4
Lot 35 - Bus Terminal	30,381.00	3.0
Lot 36 - Commercial Mixed use	70,723.10	7.1
Lot 37 - Fire Station	21,427.50	2.1
Lot 38 - Conference and Exhibition Centre	107,299.00	10.7
Lot 39 - Green Belt	137,585.00	13.8
Lot 40 - Vocational Education and Training Centre	363,378.00	36.3
Lot 41 - Bwefumu Pr/Sec School	140,952.00	14.1
Lot 42 - KMKM	64,813.80	6.5
Lot 43 - Hotels	71,713.00	7.2
Lot 44 - Fumba Forodhani	37,830.30	3.8
Lot 45 - Car Parks	27,202.00	2.7
Lot 46 - Sea port	53,373.30	5.3
Lot 47 - Hotels	32,090.10	3.2
Lot 48 - Government City	713,230.00	71.3
Lot 49 - Police Station	9,033.54	0.9
Lot 50 - Fish Market	6,188.09	0.6
Lot 51 - Deep Sea Fishing Marine Science and Technology	134,273.00	13.4
Lot 52 - Marina	7,579.14	0.8
Lot 53 - Marina	7,579.18	0.8
Lot 54 - Marina	7,933.78	0.8
Lot 55 - Fiber Glass Industry	32,352.70	3.2
TOTAL	**13734954.1**	**1373.5**

Plate 7. 1: Aerial View of Proposed Sport Centre

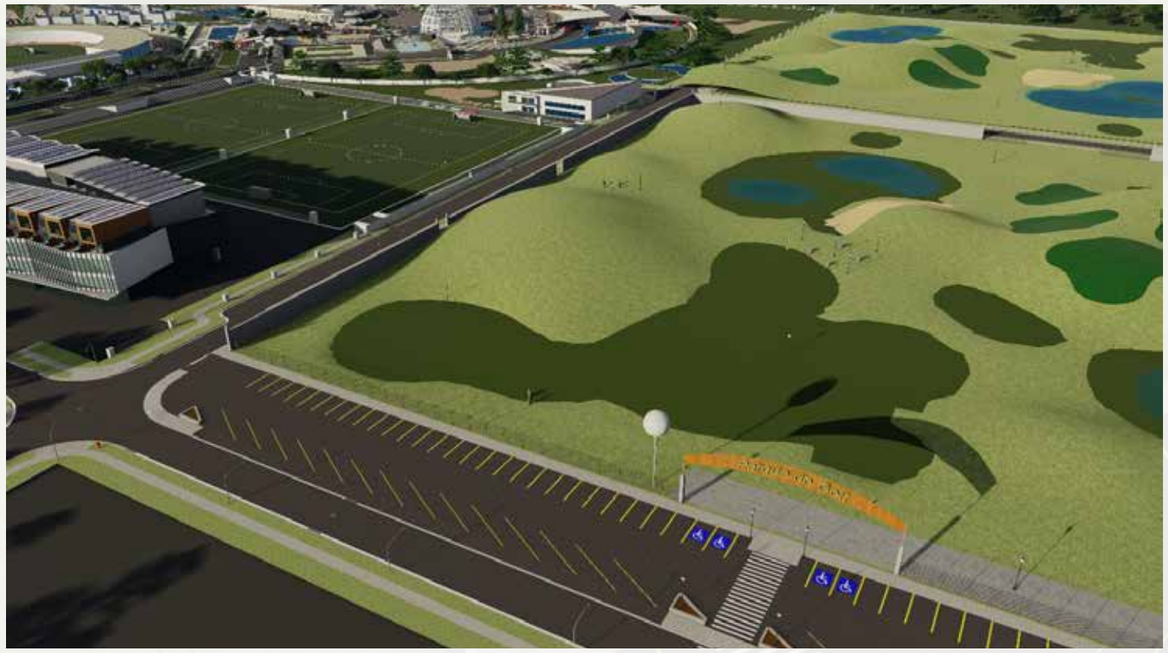


Plate 7. 2: The 3-D of the proposed Golf-Course area

Plate 7. 3: The 3-D of the proposed facilities within the Sport Centre

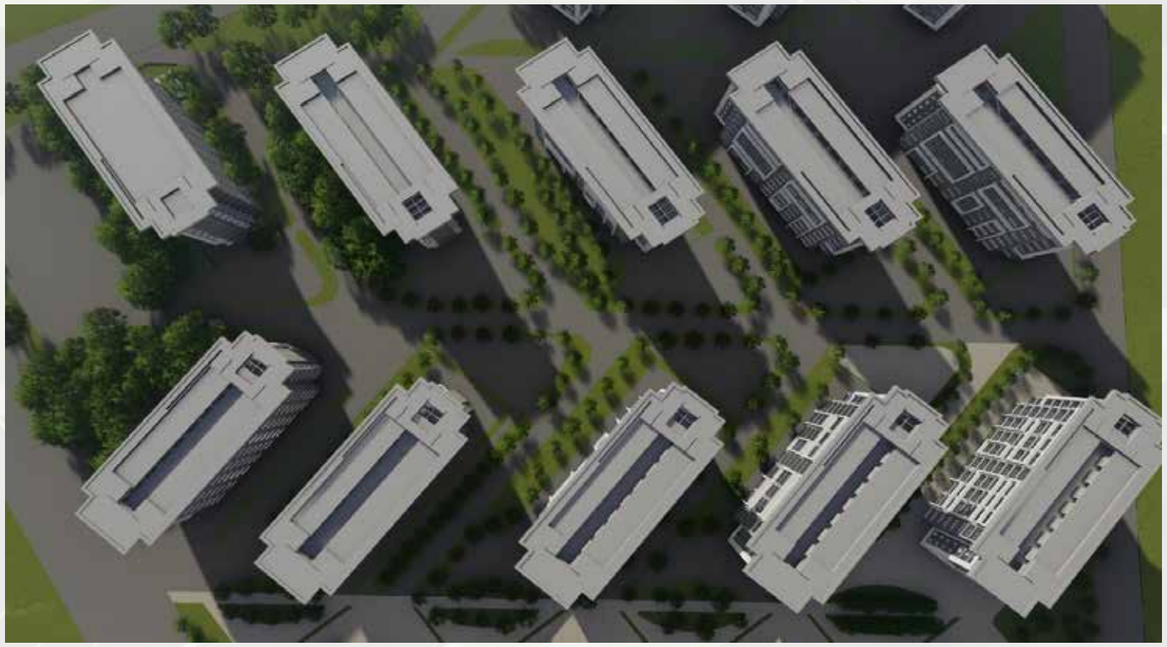


Plate 7. 4: The 3-D of propose housing estate for high density areas

Plate 7. 5: The 3-D of proposed housing estate for medium density

Plate 7. 7: Some of the proposed office apartments in Fumba Free Economic Zone

Plate 7. 6: The 3-D of proposed residential apartments for medium density

Map 7. 3: BRT Route along the proposed Offshore Financial Centre

Plate 7. 8: The 3-D of the BRT Bust-Terminal

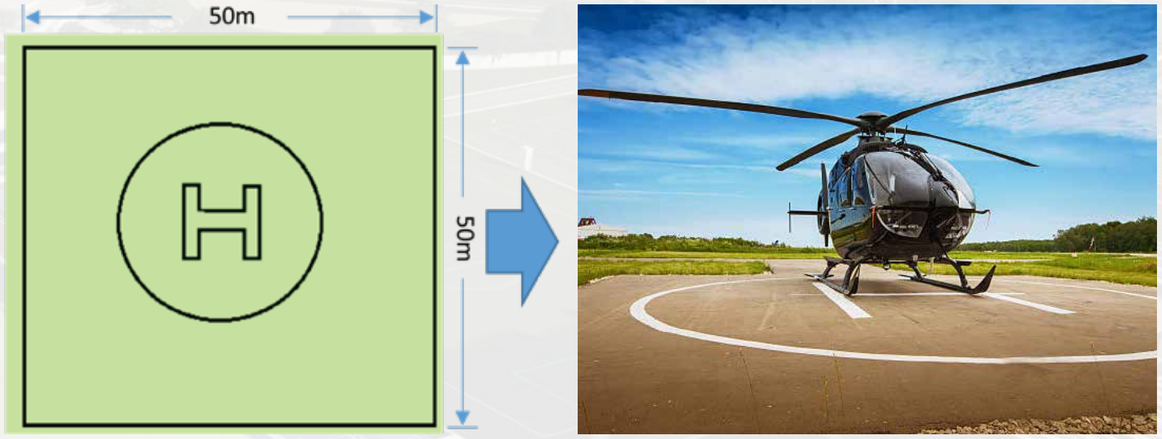


Plate 7. 9: The 3-D Projection of proposed ZIPA Tower

7.3 Proposed Economic Development Interventions

Proposal for economic development at Fumba Free Economic Zone takes into account existing situation of economic derivers of Zanzibar and also the Zanzibar Blue Economy Policy (2020) which aim at promoting sustainable economic growth, environmental stewardship and improved livelihoods through the sustainable utilization of the sea and other blue resources.

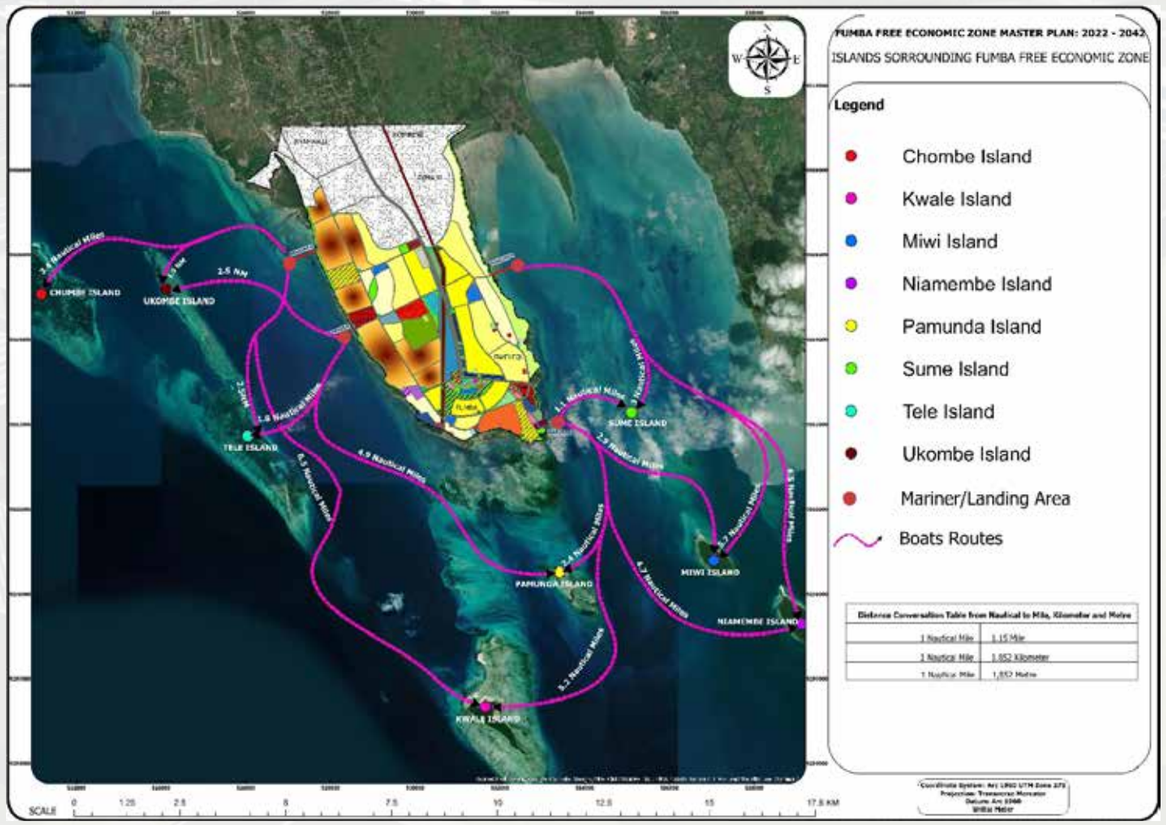
Plate 7. 9: The 3-D Projection of proposed ZIPA Tower

7.3.1 Tourism sector

This sector will at the heart of the islands development for the next 20 years and has the potential to employ thousands both directly and indirectly. Following visits to see all segments of the tourism offer, it is clear that a hotel development on the FTZ would be advisable given the (i) presence beaches on the coastline bordering the FTZ, (ii) presence of few Hotels such as Fumba Beach Lodge (iii) other services planned will require modern hotels (iv) presence of small scale marine tourism that can be strengthened.

The beach hotels and lodges should be linked to the small islands by mariners as shown in Map 7.2. In the map four locations of mariners have been proposed as a connecting nodes to the islands. The proposed routes and mariners will create additional competitive advantages for Fumba Free Economic Zone as new and important tourist destinations for service industries and hospitality.

Map 7. 4: Proposed marine routes to the small islands surrounding Fumba FEZ



7.3.2 Aquaculture sector

Aquaculture sector refers to two key economic activities (seaweed and pearl farming) that have the potential to transform the lives of those involved and generate significant exports for Fumba Town. In this regard, Fumba Town can be strengthening the aquaculture activities ranging from fishing, seaweed farming and peal farming.

Fishing

Fishing is the mainstay of all the communities surrounding Fumba Free economic Zone namely Fumba, Bweleo, Dimani and Nyamazi Shehia). Current finish activities are undertaken on a subsistence level with limited commercialization. The industry has potential that is yet to be exploited. There is no fish processing facility nor cold storage facilities and as such fisher folk are forced to sale all they catch in order to limit loses if the fish is not sold on the day of the catch. As such, the FEZ presents an opportunity to attract investment into fish storage facilities which in turn would catalyze the professionalization of the sectors and boost incomes in the fishing community. This Master Plan proposes the expansion of existing Deep Sea Fishing Organization to be the centre of deep sea fishing, science and technology to address the aforementioned issue. The following components of the value chain have been identified;

(i) **Processing** – simple methods include drying, smoking and salting the fish in order to preserve it and sell to various segments of the market in Unguja and Pemba. This low level of value addition is possible and would not require significant investments but would have a positive impact on income for the fishing community.

(ii) **Trading and export** – there is potential to use the FEZ to attract investors willing to setup a storage operation that would create a viable and sustainable fishing sector.

Seaweed farming

Seaweed is already established in Magharibi B and specifically in Fumba. Currently there is a significant number of women 80% involved in growing seaweed. The traders aggregate, dry, and package the seaweed for export to the Asian market. To date very little processing and value addition is done in Fumba and hence this creates and opportunity to attract investors including the existing traders to set up a drying, processing, and value addition facility within the Fumba Free Economic Zone. The seaweed value chain can be broken down into the following constituent parts;

(i) **Nurseries** – where various strains of the seedlings are grown and tested in order to produce the best seedlings for the sea conditions around the Fumba FEZ and other areas of Unguja Currently, the traders are providing the seedling.

(ii) **Equipment supply** – currently provided by traders but this could also be an opportunity for the local suppliers of fishing and farming equipment to participate in the distribution of the equipment.

(iii) **Storage & aggregation** – opportunity for the out growers further from the Fumba to be serviced by storage agents whose key task is to aggregate and transport the seaweed to the processing facility in the FEZ.

(iv) **Out-growers, Processing value addition and export** – current traders can be encouraged with the right incentives to invest in the small processing facility in the FEZ. Value addition is critical in extracting the best export price for the seaweed.

Pearl farming

Oyster farming is done in both fresh and saltwater. Given the seawater quality in Fumba, it is possible to strengthen an oyster farming industry which will lead to the production of saltwater pearls. The oyster farming in Shehia around the Free economic ***Zone*** are facing the following challenges, the irregular and unreliable market (products are sold with difficulty after a long time), the lack of technical expertise to achieve high quality of pearls (surface and shape imperfections and low lustre), the insufficient farming and jewellery equipment (due to economic reasons) and difficulties to locate adult oysters. Pearl farming was also practiced for few years after its introduction in the ***Shehias*** and, but has completely ceased due to reduced interest for the aforementioned reasons. Through Fumba Free Economic Mater Plan, oyster faming can be strengthened since it offers employment and generate income to locals. The following stages of the value chain have been identified as opportunities in the strengthening of the sector in the envisaged Fumba Smart City with wide range of investment opportunities .

(i) **Breeding** - breeders would identify the most productive and fast-growing oysters and these would be bread to fits the sea conditions in Fumba Smart City. The breeders would then sell on the oysters to the pearl farmers.

(ii) **Farming the oysters** – a unique opportunity for the current crop of fishermen in Fumba Smart city and surrounding areas to diversify into pearl farming. The farmers would need significant training on the farming and extraction techniques.

(iii) **Traders** -for the value chain to be developed a critical component is finding buyers / traders who have access to various pearl trading markets in the Middle East and Asia. The ideal situation would be for the traders to set up a polishing operation in the FEZ however, this would require Fumba Smart City to prove that it can produce high quality pearls that would command a significant premium in order to justify investments in a polishing operation

7.3.3 Urban Agriculture

Urban Agriculture is and will continue to the mainstay of the island's development. The FTZ presents an opportunity to add value to the islands produce in order for it to attract higher prices in the local, regional and other markets. There are a number of current agricultural value chains that can be professionalized and commercialized in addition to new value chains that would help the island attract investment and improve the aesthetic in the FTZ. These include;

7.3.4 Horticulture

Horticultural activities are conducted in Fumba Free Economic Zone and existing ***shehia for*** mainly for subsistence. Horticultural activities in Fumba Free Economic Zone should be strengthened to keep in pace with the expansion of other economic activities. In this regard, Fumba has favorable climate and soils that can support the intensification of horticulture farming with a focus on the type of vegetables demanded in Zanzibar. Given the perishability of vegetables, it is potential to create cold storage facility that would facilitate the washing and drying of the vegetables before they packed. Additionally, there should be an effort to change the lives of smallholder farmers through integrated horticulture farming, where farmers integrate different types of plants in one area for optimum utilization and management of available resources. The ultimate aim is to enable the farmers to benefit from the tourism value chain in Zanzibar. The aforementioned effort should strengthen the production capacity of existing smallholder farmer groups to help them move from micro entities to small-scale commercial enterprises

7.3.5 Real Estate Development

The high demand of low cost housing in Unguja together with availability of unutilized land in Fumba Free Economic Zone accompanied with signal of two already existing real estate developers (CPS and Bakhresa Group of Companies) provides an opportunity to take this as advantage. This requires the construction of high-end middle and top class apartments in Fumba Free Economic Zone, both furnished and unfurnished apartment will attract many people to reside in Zanzibar from around the world. Nevertheless, to achieve these ends, RGZ should strive to overcome the following constraints: Limited capacity and capital in real estate development. Second housing support services unavailable for progressive home improvement such as water, energy, street roads, security, sewerage system and the like, architectural and engineering advice, building code compliance advice, bulk purchase options for building materials and inadequate sands. In this regard much be done in Fumba FEZ to ensure fully supply of affordable housing by integrating infrastructure development, community-based urban development, building codes, planning and urban design, public and private funding sources, and progressive home improvement as well as green-field development schemes. Moreover, RGoZ should establish fair housing finance solutions, because mortgage markets reach only the top few individuals and promote establishment of local financial institutions for lending to real estate developers and housing microfinance borrowers.

7.3.7 Modern Market Infrastructure Construction

Majority of the residents of Magharibi B are involved in small business, fishing, petty trade, and livestock keeping. Therefore, construction of modern market and associated infrastructural facilities to smoothen trade and reduce transaction cost is necessary for inclusive growth. Recently most residents are depending on Darajani Central Market in Stone Town. The market construction will provide an environment for looking at and buying merchandise that is displayed for sale. Markets in envisaged Fumba Smart City to be built in Fumba Free Economic Zone also provides low-cost retailing facilities based on small-scale operations and they will typically serve low , middle and higher income. Other advantages of modern market constructions include:

(i) to provide opportunities for the exchange of goods and for sales by producers in peri urban areas

(ii) to provide, at assembly markets, opportunities for the bulking-up and export of goods and produce to other districts and regions

(iii) to provide easy access to a wide range of produce for consumers;

(iv) to provide an important means of generating a diversity of retail outlets in Fumba Free Economic Zone by supplying low-cost space for street vendors who use stalls or carts and do not therefore require buildings; and

(v) to provide an opportunity to achieve improvements in food hygiene standards and reductions in post-harvest food losses.

(vi) revenue generation to ZIPA

Additionally, Fumba Free Economic Zone is endowed with potential coastline, and contains many fishermen, whilst they depend on Forodhani fish market located in stone town. Therefore, Fumba Free Economic Zone should open to investors who want to construct modern fish markets that will serve Fumba residence and beyond. Thus, the modern market constructions in Fumba Town will results in improved efficiency, employment creation, public health befits, amenity and aesthetic benefit, time saving and generation of public revenue.

7.3.8 Parking Facilities

The provision of car parking is a fundamental component of all urban development because of the increment in social economic activities. Parking facilities are important because development of car parking spaces that reduces congestion, unsafe traffic conditions or result in illegal parking and may impact on the commercial viability of businesses. Conversely, an overprovision of car parking spaces in the Fumba Tree Economic Zone may encourage car use and is an uneconomical use of urban land. In this regard, Fumba Smart City should strive to ensure optimal provision of parking spaces to accommodate the proposed initiative of increasing social and commercial expansion. This is partly because Fumba Smart City will be strategic area for Zanzibar's tourism and trade performance given its geographical location. In addition, parking facilities area completed by advertisement rights, renting of commercial space like kiosks, ATMs, Telephone Booths that will generate revenue and employment to Fumba Smart City. User fees for parking facilities should be introduced to increase revenue for ZIPA and also to discourage vehicular movement within the smart city at Fumba Free economic zone.

7.3.9 Health care facilities (medical city)

The project will involve construction and refurbish of various health facilities in Fumba Free Economic Zone. The facilities will cover hospitals, medical school institutions and other research institutions to form the so called medical city. The project aimed to provide general and specialized health services to low, middle and high-income residents in Zanzibar and beyond. Furthermore, the facilities will provide health laboratory surveillance and innovative information, with a focus on event based surveillance, disease prediction and improved public health decision-making and action. Also, participate in the functional and linked clinical and public health laboratory networks as well as supporting public health emergency preparedness and response plans. Because of the possible returns from this project, collaboration with financial institutions or public private partnership could be an ideal approach. The medical city forms an important economic activity because will result into the improvement of quality human capital development that are key inputs to sustainable development.

7.3.10 Integrated Recreation Facilities

Within Fumba Town the proposed Sport City provides various recreational facilities such as eco parks' football grounds, cricket, golf course, basketball, Olympic swimming pool among others are vital to economic nourishments because well-planned parks and recreation systems serves as a catalyst for economic development. Availability of parks and recreation facilities and active transportation infrastructure will increase property values, foster job creation, and provide a foundation for place-based economic development in Zanzibar. Additionally, parks will attract consumers from Pemba, Dar es Salaam and beyond and spur the opening of local restaurants, and increase tourism activities.

7.3.11 Recommendations to unlocking the potential

Our filed visits to the island and discussion with communities and in particular current investors on the island have identified a number of critical factors and issues that have to be addressed if the Zanzibar in general and Fumba in particular need to achieve takeoff. These pre-requisites include the following;

(i) Infrastructure investments (roads and utilities)

The road network and the utilities to the FEZ and the surrounding districts will need to be upgraded in order to signal to potential investors that the RGoZ is serious about attracting investment to the Fumba FEZ. The build out of the FEZ will also send a strong signal to the community in the district and beyond that the government is serious about the development of the area. This will also enable the domestic investors plan how to effectively participate in exploiting the opportunities / economic activities in the FEZ.

(ii) Skills development

If the community is to benefit from the FEZ, they have the appropriate skills and training to access the jobs and economic opportunities that emerge. The RGoZ as to signal that it is willing to develop the local workforce which in turn will give investors comfort that the necessary workforce is available and labour would not have to be imported at significant cost. Zanzibar needs to have a skills development strategy that is aligned to its industrialization strategy, tourism strategy and investment strategy. Three lots for Vocational Education Training Centre and Universities have been proposed in Fumba Free Economic Zone for Skill Development, Research and Innovations.

(iii) Seaports and Marine Transportation

As a Strategic Direction of ZDV 2050 to make Zanzibar a regional hub for maritime transportation, the RGoZ should strengthen the marine transport because its economy heavily relies on marine transportation to facilitate trade with the rest of the world. Currently, the islands' main seaport at Malindi alone handles about 95% of Zanzibar's trade and nearly 3 million ferry passengers per year. Given the importance of marine connectivity, the government has invested considerably in the sector by upgrading port facilities at Malindi, Wete and Mkoani as well as undertaking initiatives to establish commercial ports at Mpigaduri and Wesha and an O&G port at Mangapwani. Private sector participation has continued to increase with government support, particularly in the provision of passenger ferries connecting Unguja to Dar es Salaam and Pemba. Nevertheless, seaport and maritime services have not been leveraged fully for Zanzibar to serve as a transshipment hub in East Africa and the Indian Ocean. The port at Malindi has experienced a decline in performance amid rising trade demand due to its low carrying capacity. The port currently takes 5-6 days to offload cargo, leading to a loss of productivity and raising freight costs. As marine trade grows in importance with the new intended Fumba Development calls for the development of sea port at Fumba as a way to expand marine transport.

7.4 Proposed Utilities

7.4.1 Water supply system

Water supply options for the proposed Fumba Special Economic Zone will be piped water supply. ZAWA has the ongoing initiatives for improvement of water supply service which provides a better opportunity for supplying a reliable water in Fumba Free Economic Zone. The current Exim Indian Project for water supply is at take-off stage which entails drilling of more boreholes in Dimani, construction of reservoirs and water distribution system which will also cover Fumba Free Economic Zone. It is advised to consider various types of water demand when determining the size of the transmission main to envisaged Fumba Smart City. The 37.5% of daily average demand will be used to design the storage tank which carter for equalization during supply fluctuations. Water from different sources will not be combined until treatment is done if required. Types of water demands considered in this project are as follows:

i) Domestic water demand (housing estate and apartments)
ii) Institutional water demand (public and private institutional buildings including, recreational areas, education and health care facilities)
iii) Industrial water demand
iv) Commercial water demand (hotels, shopping centres, supermarkets, bus terminal, shopping malls, lodges and other indoor entertainment centres etc)
v) Firefighting water demand.

Domestic Water Consumption

This type of demand covers for all type of residential premises including housing estates and apartments, in the project area and the nearby communities if need arises. The amount of water consumed depends in part on the level of service that provided. It is at its lowest when water is distributed through domestic points (public taps or kiosks) some walking distance from the house. When the water is brought to the house by piping the consumption increases considerably. With waterborne sanitation and high standard of inside installations (bath, washing machine etc) the per capita consumption may be ten times more than from a public tap (MoW design Manual 2009). The domestic water demand estimations will be done based on tables 5.1 of the MoW Design Manual.

The distribution system should be designed as a grid iron system to ensure good circulation and sufficient pressure at all points. Stop valves to be placed at all junctions in the system so that water supply pipes in any road may be isolated for repair and maintenance purpose. The size of the transmission main should consider all types of demands at end of this planning horizon and should be of be of recommended materials. Sizes of services connection pipes will depend on respective department requirements. All sizes using HDPE pipes. Services connections DN 25 shall not exceed 30m in length; otherwise DN 32 has to be installed. For larger non domestic use, the size of connection will be determined in connection with the actual demand.

Table 7. 3: Design per capita water consumption for different categories

Consumer Category (Level of service	Rural Areas (l/ca/d)			Remarks
	FR	M-UT	M-PBT	
Housing Estate for high density and medium density area	130	110	90	Medium income group housing with sewer or septic tank
Housing Estate for Low density area (beach villa)	250	200	150	High income group housing with sewer or septic tank

FR+Flat rate; M-UT=metered with uniform tariff; M-PBT=metered with progressive block tariff

NB: 130 l/ca/d selected taking into consideration Medium income household (*MoW design Manual 2009*).

Institutional Water Demand

Public and private institutions include including schools, higher learning institutions, Hospitals, Administration Offices, Police Station, Fire station, Missions, Religious facilities, private institutions etc. Table 7.2 of the MoW Design Manual will be used to determine the demand for institutional water demand. The water requirements for staff working in the institutions will be estimated separately in the same way as for other domestic water consumption (MoW Design Manual 2009).

Table 7. 4: Institutional Water Demand

Consumer	Unit	Consumption	Remarks
Health care Dispensary	l/visitors/d	10	Outpatient only
Health Centre	l/bed/d	50	No modern facilities
	l/bed/d	100	With WC and Sewer
	l/bed/d	200	District hospital
Hospitals	l/bed/day	400	Regional with surgery
Administrative office	l/worker/day	10	
	l/worker/day	70	With WC

(MoW Design Manual 2009).

Industrial water demand

The water consumption in industry varies depending on the kind and size of the industry. Some are dry industries which consume virtually no water in their processes, and the only water consumption is that for staff and cleaning of the premises. On the other hand, the water requirements for wet industries can be a significantly high. In the estimations of industrial water demand, Table 7.3 and Table 7.2 on MoW Design Manual 2009 will be used in this project. Since the type of industries is not clearly known as it will depend on the decision of the investor, though the plan is to establish light industries with minimum amount of pollutions. Table 7.3 shows an estimate of the water requirements.

Table 7. 5: Industrial water demand (m^3/ha/d) for industrial area

No	Industry Type	Water Demand M3 /Ha/D
1	Medium Scale (water intensive)	50
2	Medium scale (medium water intensive)	20
3	Small scale (dry)	5

***Source:** MoW Design Manual - 2009*

The water requirement estimation will be based on the assumption that average figure of the water demand column will be enough, whereby industry types are equally distributed and therefore each hectare occupied by industry will be assigned 25m3 of water.

Commercial water demand

Commercial water consumption occurs in hotels, restaurants, shops, small workshops, service stations, etc. Commercial water requirement in this project is based on the estimated development of this sector. Table 7.4 of MoW Design Manual gives water consumption figures for hotels and restaurants. In the case of this project there is only a reservation in the plan for the future business area without any specification yet. The estimate will be based on per hectare demand. As a guide, a water demand of 10 – 15m3/ha/d for a non-specified commercial area in a new town plan will be adopted.

Table 7. 6: Commercial Water Demand

Consumer	Unit	Consumption (l)	Remarks
Hotels	l/bed/d	70	Low class
		200	Medium class
		400	High class
Lodges	l/visitors/day	70	Low class
		100	Medium class
		300	High class
Shops	l/visitors/day	70	Low class
		130	Medium class

Source: MoW Design Manual – 2009

Firefighting water demand

Firefighting requirements in the planning of urban areas is necessary and the water supplied normally forms part of the unbilled authorized consumption. Dimensioning flows, reservoir storage and all firefighting requirements are considered by using tables 7.1, 7.2, 7.3, 7.4 and table 7.5 of the MoW Design Manual-2009. The determination of firefighting requirements in this project will be done by using the simplified approach as per table 7.5.

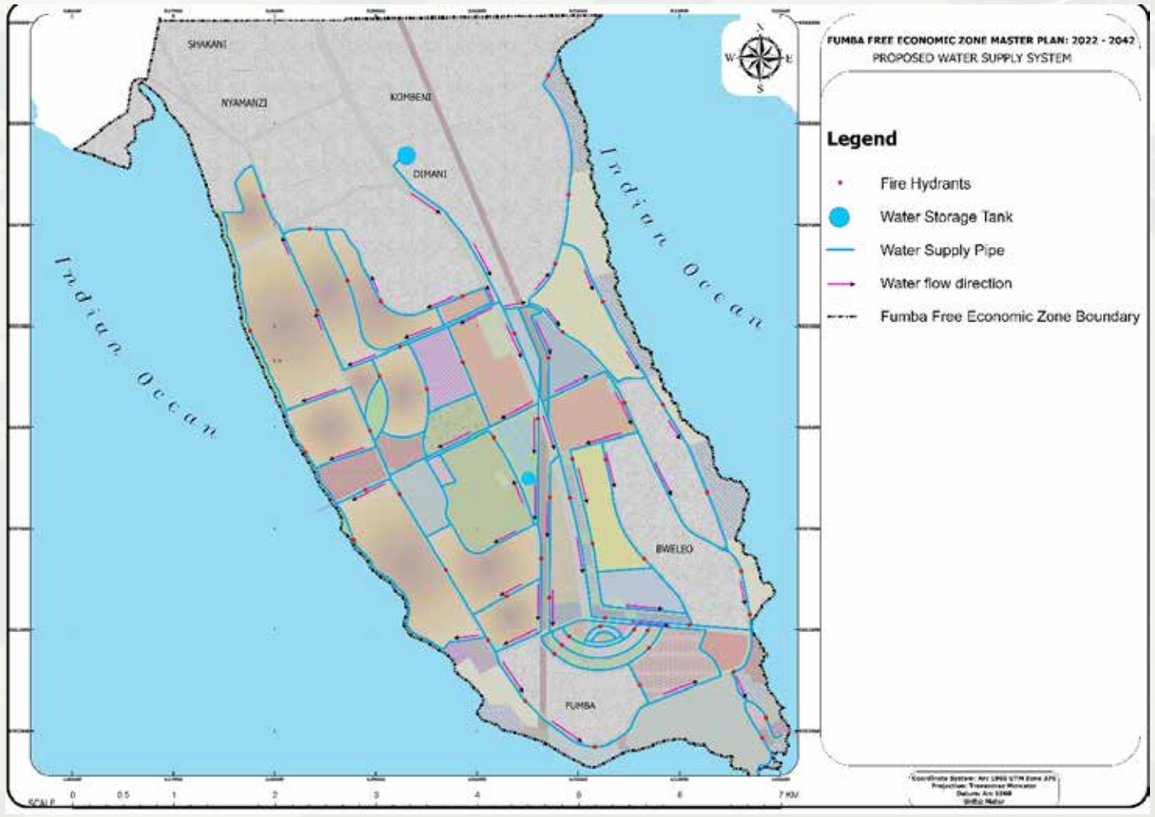
Table 7. 7: Firefighting flows

Category	Description		Minimum Flow In L/S
Housing	Housing developments with units of detached or semidetached houses of not more than two floors should have a water supply capable of delivering a minimum through any single hydrant of:		8
	Multi occupied housing developments with units of more than two floors should have a water supply capable of delivering a minimum through any single hydrant on the development of:		20 - 35
Transportation	Lorry/coach parks, multi-storey car parks and service stations	All of these amenities should have a water supply capable of delivering a minimum through any single hydrant on the development or within a vehicular distance of 90 meters from the complex of:	25
Industry	In order that an adequate supply of water is available for use by the Fire Authority in case of fire it is recommended that the water supply infrastructure to any industrial estate is as follows with the mains network on site being normally not less than DN150	Up to one hectare	20
		One to two hectares	35
		Two to three hectares	50
		Over three hectares	75
Shopping, offices, recreation and tourism	Commercial developments of this type should have a water supply capable of delivering a minimum flow to the development site of between:		20 - 75
Education, health and community facilities	Village and small community halls	Should have a water supply capable of delivering a minimum flow through any single hydrant on the development or within a vehicular distance of 100 meters from the complex.	15
	Primary schools and single storey health centers	Should have a water supply capable of delivering a minimum flow of through any single hydrant on the development or within a vehicular distance of 70 meters from the complex.	20
	Secondary schools, colleges, hospitals and community facilities	Should have a water supply capable of delivering a minimum flow through any single hydrant on the development or within a vehicular distance of 70 meters from the complex.	35

***Source:** MoW Design Manual-2009*

Note: For industries, the principle is that if the firefighting water demand is bigger than what is normal capacity of the distribution system, the industry in question must provide its own water reserve for firefighting.

Map 7. 5: Proposed Water Supply Network



Water Storage/ storage reservoir

The storage reservoir has the functions of adjusting the amount of distribution of water over time, as well as providing stable water supply to the consumers using stored water when there are abnormalities in the pipelines. The plan is to install the facility at the highest point of the water supply service area if possible, and the proper height will be secured so that a proper dynamic pressure inside the water supply service area is maintained. As per the Design Manual total capacity of water storage normally lies between 30% and 50% of the daily demand and depends on peak factor adopted. In this Master plan a factor of 37.5% suggested in sizing the storage tank. Under the current project, there is construction of reservoirs with a capacity of 2,000,000 litres and 3,000,000 litres of water, the storage needs to be assessed against the envisaged demand.

Rehabilitation of the existing water supply network

Owing to time constraints, a thorough analysis, including survey on the entire water supply system was not possible. However, on the basis of interviews and site visits maintenance and rehabilitation/ replacement of some fittings that have leakages, scratched and units such as Gate Valve chambers, valve chambers cover within the existing water supply to be rehabilitated.

7.4.2 Proposed Storm Water Management system

Urban development in particular, changes not only the physical, but also the chemical and biological conditions of waterways and downstream water resources. Following the development of the land, the hydrological cycle will be disrupted and altered. Clearing removes the vegetation that intercepts and slows runoff allowing the return of rainfall to the air through evaporation and transpiration. Grading flattens hilly terrain and fills in natural depressions that slow and provide temporary storage for rainfall, scraping off and removing the topsoil and layers of humus and compacting the remaining subsoil. Rainfall that once percolated into the ground now runs off the surface. In this project there will be addition of buildings, roadways, parking lots and other surfaces that are impervious to rain water which will further reduce infiltration and increase runoff. This calls for storm water management as an integral part for this project.

It is hereby advised to have storm water drainage system along all access roads; the existing and proposed new roads to ensure effective conveyance of storm water from Fumba area towards the Indian Ocean. For roads with dead ends, storm drains should be extended to the nearby storm drains to ensure effective collection and conveyance of storm water. In addition to new channels, old and dilapidated channels should be maintained.

Determination of Quantity of Storm water

Determination of peak runoff discharges, the Rational Method gives sufficiently accurate results for catchments of up to about 50 ha. Due to assumptions regarding homogeneity of rainfall and equilibrium conditions at the time of peak flow, the rational method should not be used on areas larger than this without subdividing the overall watershed into sub-basins including the effect of routing through any drainage channels. For areas more than 50 ha the UK TRRL (Transport and Road Research Laboratory) method can be used, but preferably the former as it was specifically developed for eastern Africa unless a more recent Rainfall – Intensity - Duration analysis is unavailable ***(MoW Design Manual-2009).***

The Rational Method

If rainfalls were applied at a constant rate to an impervious surface, the runoff from the surface will eventually reach a rate equal to the rate of rainfall. The time required to reach this equilibrium is the time of concentration (tc), and for small impervious areas it can be assumed that if rain persists at a uniform rate for a period at least as long as the peak of runoff will equal the rate of rainfall. This is the basis of the rational formula originally developed in imperial units.

$$Q = k \times C \times i \times A$$

Where,

Q = runoff discharge (m^3/s)

k = conversion factor = 0.00278

C = dimensionless runoff coefficient

i = rain intensity (mm/h)

A = catchment area (ha)

The rain runoff discharge (Q) is that portion of the total precipitation from a given area, which appears in natural or artificial surface streams, whilst the catchment area (A) is the surface area (watershed) which contributes its drained waters to a specific site.

The rainfall intensity (i) is the maximum or peak flow of a runoff depends on the intensity and duration of rainfall. The intensities are derived with the analysis of rainfall charts (I-D-F-curves) corresponding to the selected return period, Tr.

Runoff coefficient (C) – is the ratio of the maximum rate of run – off to the uniform rate of rainfall with a duration equalling or exceeding the time of concentration which produce this rate of runoff, values for which are given in the Table 7.9 of the MoW Design Manual - 2009.

TRRL Method

The TRRL Method was developed specifically for Tanzania, Kenya and Uganda using rainfall data for a selected number of stations and resulting in a number of Tables and Graphs that are referred to in its application. The Intensity – Duration relationship applicable for durations between 15 minutes and 24 hours takes the form:

$$I = a / (T + b)^n$$

Where, I = intensity (mm/hr)

T = return period (yr)

'a', 'b' and 'n' are constants.

Based upon the work by TRRL an acceptable value for 'b' for Tanzania was found to be $^1/_3$.

Data derived for the other two constants for some rainfall stations in Tanzania are shown in Table 7.8 of the MoW Design Manual. Since Zanzibar is very close to Dar es Salaam the rainfall intensity - duration relationship for Fumba will be assumed to be equal to that of Dar es Salaam and the figures in the Table 7.8 will be used in the determination of quantity of storm water.

Table 7. 8: Intensity-duration relationship

STATION	2 - YEAR		5- YEAR		10 - YEAR	
	a	n	a	N	a	n
Dar es Salaam	57.83	0.91	68.83	0.86	77.41	0.84

Source: Table 11.3 of MoW Design Manual - 2009

Method selection

Since the area under the project is about 3,000 ha which is by far bigger than the 50 ha, the TRRL (Transport and Road Research Laboratory) method will be used in determination of quantity of storm water.

Drainage systems components

Storm water drainage systems are mainly open channels and closed conduits (pipes) with a free-water surface. Storm water from the surfaces is conveyed through the drainage systems to the discharge point by gravitation. The slopes of the drainage system will be planned to follow the natural topography of the project area in order to minimize excavation and installation costs. Storm drainage systems consist of inlet boxes for collecting the runoff, conduits (open or closed) for conveying it. Drainage channels in the streets of the project area will be lined with concrete bricks, inter-locking pre-cast slabs, or reinforced hollow blocks, to ease maintenance and to resist earth and vehicular loads.

In addition to collection and conveyance of storm water to Indian Ocean it also recommended to consider rain water harvesting from paved areas by construction of storm water storage basins. Water from storage basins could be used as source water supply to supplement the deficit especially during dry periods. Apart from water supply the harvested water could be used for irrigation. This Master Plan has set aside 13.5 Hectares for storm water storage facilities, surface and underground water storage facilities.

7.4.3 Wastewater management facilities in Fumba Free Economic Zone

Wastewater (sewage) management involves the collection and conveyance of wastewater from occupied areas to some points of treatment or disposal, usually off-plot but in certain circumstances on-plot. Fumba Free Economic Zone is undergoing tremendous transformation due influx of various investors in the special economic zone. This will change the existing rural set up into a city or a town of its own kind with various tourist attractions and influx of people. One of the effects of influx of investments and people in Fumba Free Economic Zone is high water demand and generation of large quantities of wastewater and solid wastes which calls for integration of investment of waste management infrastructures into the overall development plans of Fumba Free Economic Zone.

Wastewater management infrastructure is very essential in ensuring environmental and public health well-being. Improper management of this wastewater will result into pollution of environment particularly the sea water leading to nasty conditions to the recreation areas surrounding Fumba Free Economic Zone including beaches which attract tourists. Based on the topography of Fumba Free Economic Zone, centralized wastewater management may necessitate pumping of sewage in some areas which has financial implications on investment and operation costs. Under this condition, adoption of decentralized wastewater management system becomes the best option on technical and financial bases. With decentralized wastewater management system there will be a decentralized sewer network collecting wastewater from households and other entities from which wastewater flow by gravity towards a treatment plant. Selection of suitable technology for wastewater treatment needs consideration of multiple factors but most importantly efficiency, land requirement and location matter the most.

Projection of quantities of wastewater

In this project we will consider domestic wastewater and industrial waste water while all the remaining types of wastewater will fall under either of these two categories. Domestic and Industrial waste water, obviously is estimated from water supplied. Studies have shown that depending on the water consumption pattern, different proportions of the water supplied is collected as waste water (*MoW Design Manual - 2009*).

Domestic wastewater projection

For design consideration the value of 60 to 85 % of the per capital demand of water becomes wastewater. The lower value (< 60%) may be adopted / applied to the semiarid region or where water supply is insufficient. Table 9.2 of the MoW Design Manual give the percentage of wastewater produced in different category.

Industrial wastewater projection

The quantity of wastewater generated from industries varies widely according to the nature of the manufacturing processes. In practical design work it is therefore desirable to inspect the plant, (industry) concerned and make careful estimates of the quantities of wastewater produced. This may as well be facilitated through interviews. Where the specific type of industry is unknown, (or not easy to get information) an allowance of 50m^3/ha.d can be used for design purposes (*MoW Design Manual - 2009*). In the case of Fumba Free Economic zone, the industrial wastewater will be estimated from the water consumption. Refer **Error! Reference source not found.** above

where average water consumption is 25m^3/h.d, the industrial wastewater will be estimated by taking 60 - 85% of the consumed water. The industrial wastewater will be treated separately to attain an acceptable quality prior to discharge into sewer systems to avoid overloading of the sewerage treatment system.

Wastewater treatment technologies

Treatment of wastewater is very important in safeguarding the environment and public health. Treatment of wastewater goes through primary and secondary treatment. Primary treatment is meant for removal of coarse materials and the units used are screens and grit chambers. The principal treatment process in sewage treatment works is secondary treatment stage. There is a wide range of alternatives for secondary treatment of wastewater. Selection of secondary treatment technology needs consideration of multiple factors; for instance, more mechanically oriented alternatives are used in colder climates or where space is at a premium while waste Stabilization Ponds (WSP) are best suited to warm countries where land availability is not a problem. As a best practice, choice of technology should consider factors such efficiency, reliability, sludge production, land requirements, environmental impact, operational costs, construction costs, simplicity and feasibility for resource recovery. Application of these factors facilitates selection of treatment technology that suits the case specific conditions. Typical example is presented in Table 7.9 comparing waste stabilization ponds, Upflow anaerobic sludge blanket (UASB) and Activated sludge process (ASP).

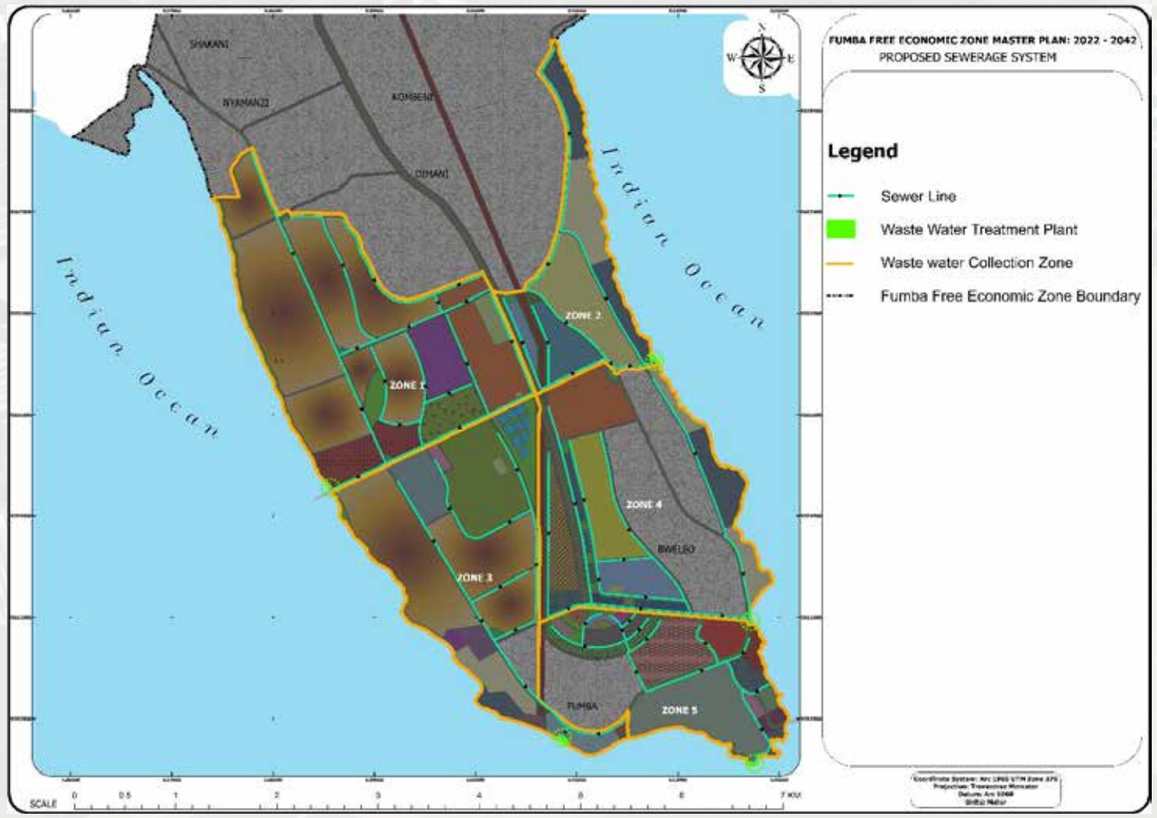
Table 7. 9: Factors to be considered in the selection of wastewater treatment option

S/N	Factors	Wastewater treatment options		
		WSP	UASB	ASP
1	Efficiency	Achieve BOD and suspended solids removals >90%, and ammonia removals also >90% in 1-4days. Efficient in removing excreted pathogens	Achieves a 70% removal of BOD in 6-12 hours, Inefficient in removing excreted pathogens and requires a tertiary treatment	Achieve BOD removal above 90% in 2-6 days Inefficient in removing excreted
2	Reliability	Reliable	Reliable	Reliable
3	Sludge production	Anaerobic ponds only produce waste sludge intermittently. Regular Disludging once every 1-3 years	Produce large amounts of sludge, about 0.2kg/ kg of BOD removed that need to be disposed of continuously	Produce larger amounts of sludge, about 0.8 kg/kg of BOD removed that need to be disposed of continuously
4	Land requirements	Require much more land and suitable when the cost of land is less than 15USD per meter squared.	Require small area compared to WSP even when polishing units and sludge treatment units are included.	Relatively less area is needed compared to WSP even when polishing and sludge treatment units are included
5	Environmental impact	Produce odour and noxious gases to the environment	Relatively low odour is experienced and there are provisions for gas collection	Produce odour and noxious gases to the environment
6	Operational costs	Very Low	Relatively low	High due power requirement for aeration.
7	Construction costs	Low	Expensive to construct but easy to maintain	Very expensive to construct and maintain.
8	Sustainability	Last for long time when properly operated	Last for long time when properly operated	Last for long time when properly operated; however, needs regular maintenance of aerators.
9	Robustness	Very robust due to long hydraulic retention time and resilient to both organic and hydraulic shock loads. They can also cope with high levels of heavy metals, up to 60 mg/l	Robust, they are used for treatment of domestic wastewaters and high-strength biodegradable industrial wastewaters. However, prolonged shock load may impair the overall efficiency.	Robust, they are used for treatment of domestic wastewaters and high-strength biodegradable municipal wastewaters. Stable over shock loading due to continuous mixing
10	Simplicity	Very simple to construct and operate	Construction is complex but operation is simple	They are more sophisticated and need electric power for aeration during operation.
11	Feasibility for Resource recovery	Treatment process produces biogas in anaerobic pond but collection of biogas is not feasible.	Treatment process produces biogas which can be collected and used for heating and generation of electricity.	No biogas production since the system employs aerobic process.

Management of effluents

Management of effluents from the treatment plants also needs sound management practices. The commonly used approach is disposal to the nearby water source upon meeting the discharge standard. The receiving water body in Fumba Free Economic Zone is Indian Ocean. Since sea show in Zanzibar and Fumba Free Economic Zone will be important recreational areas for tourist, it advised that if the effluents have to be disposed in Indian Ocean, engineered sea outfall should be used. Map 7.2 shows decentralized waste water treatments in five zones based on the topography and investments clusters.

Map 7. 6: Proposed Sewerage System



The alternative effluent management is the reuse in agriculture and horticultures. Reuse in agriculture and horticulture will necessitate underground effluent storage tank and elevated tank for effluent distribution to farms. The distribution system will also be required for supplying water to farms where it will be used. It advised to adopt drip irrigation system for protection of farm operators against potential bacterial infections, otherwise tertiary treatment may be needed for appropriate disinfection.

7.4.4 Proposed solid wastes management

Management of solid waste refers to the collection, transfer, treatment, recycling, resource recovery and disposal of solid waste in the project areas. Sorting of solid wastes at the source, adds value as it becomes convenient for recycling and resource recovery from wastes. Solid Waste Management aims to promote environmental conditions by controlling pollution (including water, air, soil and cross media pollution) and ensuring the sustainability of ecosystems in the project area. The cost effective way of solid waste management is to make sure that the solid waste separation is done at the source. This ensures availability of recoverable and recyclable materials. For the wastes fractions that can neither be recovered nor recycled are normally disposed, therefore appropriate site for solid waste disposal should be available. The effective and standard approach for effective solid wastes management is the application integrated wastes management (IWM).

Integrated wastes management

Integrated waste management (IWM) can be defined as the selection and application of suitable techniques, technologies, and management programs to achieve specific waste management objectives and goals. IWM is identified in four basic management options (strategies) for IWM:

- Source reduction,
- Recycling and composting,
- Combustion (waste-to-energy facilities), and
- Landfills.

The Strategies can be implemented in either interactive as per figure 7.4 (a) or hierarchical order figure 7.4 (b). For example, recycling can be considered only after all that can be done to reduce the quantity of waste at the source has been done. Similarly, waste transformation is considered only after the maximum amount of recycling has been achieved. Further, the combustion (waste-to-energy) option has been replaced by waste transformation. It our recommendation that the university adopt the Hierarchal orders of managing its wastes (George et al., 2002).

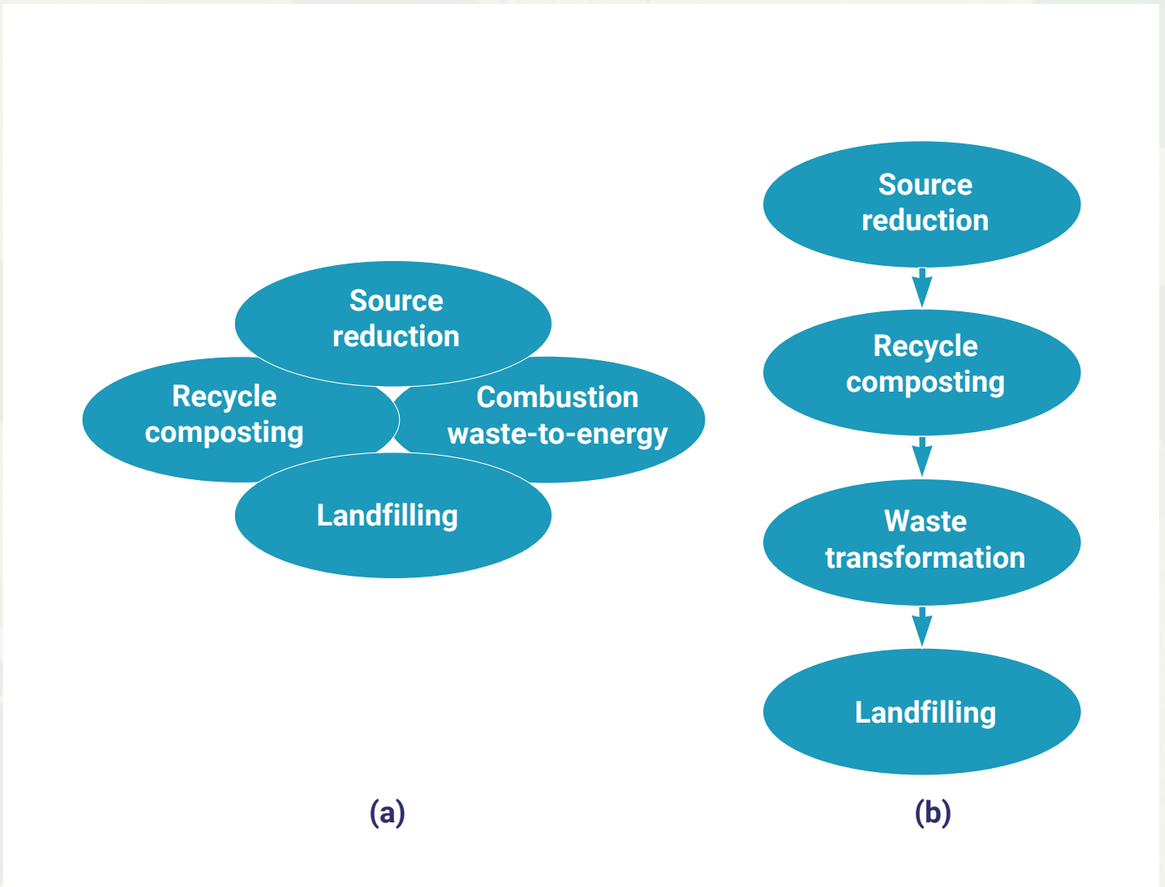


Figure 7. 3: ISWM Strategies (Source: George et al., 2002)

Source Reduction

Source reduction focuses on reducing the volume and/or toxicity of generated wastes. Source reduction includes the switch to reusable products and packaging, the most familiar example being returnable bottles. However, bottle bill legislation results in source reduction only if bottles are reused once they are returned. Other good examples of source reduction are grass clippings that are left on the lawn and never picked up and modified yard plantings that do not result in leaf and yard waste. This approach will be suitable for all industries and commercial entities planned in Fumba Free Economic Zone through purchasing of products with longer life spans, application of efficient technologies, and cut down on the purchase of disposable products. However, this also can be practiced by residents through cutting down purchase of disposable products reuse of some containers that would otherwise be wasted.

Recycling, Composting, digestion

Recycling: is perhaps the most positively perceived and doable of all the waste management practices. Recycling will return raw materials to market by separating reusable products from the rest of the municipal waste stream. The benefits of recycling are many. Recycling saves precious finite resources; lessens the need for mining of virgin materials, which lowers the environmental impact and reduces the amount of energy consumed. Moreover, recycling can help stretch landfill capacity. Recycling can also improve the efficiency and ash quality of incinerators and composting facilities by removing non-combustible materials, such as metals and glass (George et al., 2002). Recycling can also cause problems if it is not done in an environmentally responsible manner Examples include operations for newsprint deinking, waste-oil recycling, solvent recycling, and metal recycling. In all of these processes, toxic contaminants that need to be properly managed are removed.

Composting: Composting is the decomposition of wastes in solid form with production of compost. Furthermore, there is advanced composting methods with production of larvae and compost. Compost is form of organic fertilizer and may be used to improve yield while larvae are used for poultry and fish farming. The composite and larvae need market to be profitable and sustainable.

Digestion: Digestion is anaerobic decomposition of organic matter in liquid form that leads to the production methane and carbon dioxide. A mixture of Methane and carbon dioxide in the proportion of 55-75 of methane and 25-45 of carbon dioxide is a biogas. Biogas has good calorific value and burns just like natural gas. A ton of organic wastes produce 90.6 meter cubic of biogas while one meter cubic of biogas produce 6kwh of electricity. Therefore, biogas production is another alternative waste recycling method which can be harnessed in Fumba Free Economic Zone to produce useful energy. Based on the waste quantity, composition and characteristics discussed above, it is possible to have a sustainable solid waste management practice to be included in Fumba Free Economic Zone development plan including; anaerobic digestion and composting as well as use of the waste as animal feed. Even with stable markets and convenient programs, public education is a crucial component for increasing the amount of recycling. Fumba Free Economic Zone Management could enact by laws and have incentive plan to promote the recycling and reuse of waste materials.

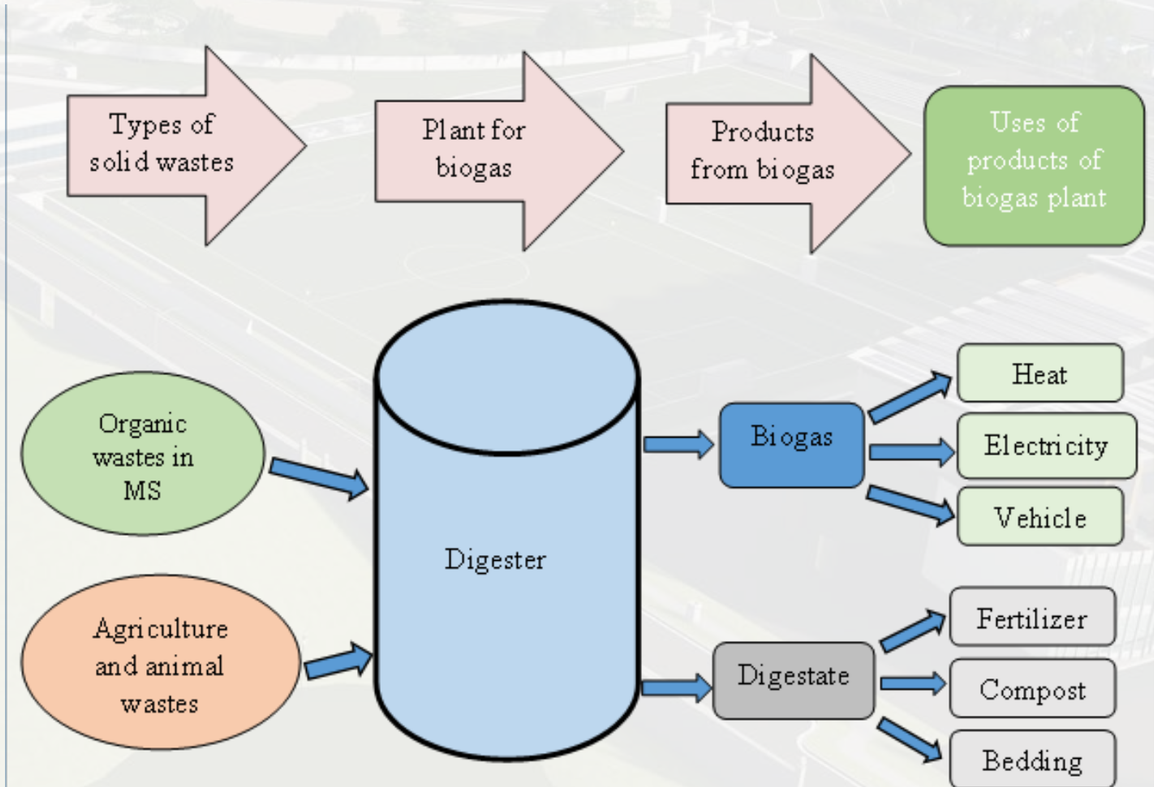


Figure 7. 4: Conceptual diagram for biogas production from wastes and the potential uses of the biogas and digestate.

Waste Transformation / Combustion (Waste to Energy)

The third of the IWM options is combustion (waste-to-energy). Combustion facilities are attractive because they do one thing very well, they reduce the volume of waste dramatically, up to nine-fold. Combustion facilities can also recover useful energy, either in the form of steam or in the form of electricity. More information is needed on waste composition in order to make an informed decision on whether to venture in energy recovery of waste through waste transformation. There are options of using the waste to create charcoal for use in cooking (briquettes), this practice is being done in many places now days in Tanzania and can also be adopted in Fumba Free Economic Zone to gain alternative energy and income generation at the same time.

Land filling

All waste management combination techniques require land filling to make them work. Of the four basic management options, land filling is the only management technique that is both necessary and sufficient. Some wastes are simply not recyclable, because they eventually reach a point at which their intrinsic value is dissipated completely, so they no longer can be recovered, and recycling itself produces residuals. The existing Kibele landfill needs to be evaluated if it feasible to dispose solid wastes from Fumba Free Economic Zone . The other alternative is to establish the landfill in Fumba Free Economic Zone of which the land value is high. The gases generated by landfill can be harnessed for utilization in the industries with high need of fossil fuel.

Summary of the proposed solid waste management

i) Incorporation of solid wastes management system in the development plans of Fumba Free Economic Zone

ii) Adoption of solid wastes separation in the wastes collection chain which facilitates recycling and resource recovery from wastes which offers opportunities for economic gains

iii) Establishment of sorting facilities at the transfer station by engaging youth for organic waste to be used for composting and biogas production.

iv) Establishment of solid wastes recycling and resource recovery facility which offer opportunities for income generation by youths.

v) Formulation of government financial mechanism for subsidizing solid wastes collection, transportation, recycling and reuse.

i) Provide containers for recyclable materials especially to the hotels where management of the sorting of SWM could be easier and accessible

ii) Community awareness campaign on wastes management focusing on sorting, waste minimization, recycling, and reuse.

iii) Government subsidizing sorting and recycling activities to motivate community and private sector participate in solid waste management through sorting and recycling

iv) Government to provide legal and institutional framework for recycling and fate of recycling products.

v) Well-established institutional and regulatory framework for effective implementation and operation of the solid waste management system.

vi) Adoption of resource recovery technologies in collaboration with private sector i.e CBO, NGO and private companies is very important for effective management of wastes.

vii) Establishment of incentive mechanism to enhance solid waste collection and sorting at different levels

viii) Encouragement of private sector to engage in solid wastes management, resource recovery and recycling in collaboration with the government.

7.4.5 Proposed Developments On Energy Sources

Zanzibar government has to encourage investors to invest in renewable energy as independent power producers (IPPs) and connect these to the ZECO grid, this will assure power availability during any submarine cable defaults.

ZECO has to address the poor supply quality and reliability of the existing electricity network, and low electricity access rate through investments in transmission/distribution network strengthening and extension;

Since Fumba Free Economic Zone will have much more commercial and residential buildings there might be one substation receiving power from the Mtoni Switch yard so that all power distribution and controls to be done at Fumba Free Economic Zone.

The proposed project social risk rating is classified as substantial under the World Bank ESF, based on the type of project and the nature of its activities, as well as capacity of the implementing agency. A preliminary assessment of sites proposed for the construction of the solar plants under Component 1 indicated no involuntary land acquisition or physical displacement. The identified sites are owned by the government and have no physical structures.

They are located at a distance from nearest settlements. Economic displacement is expected due to use of land for cattle grazing and farming of seasonal crops. Physical and economic resettlement is likely under Component 2 (Electricity Grid strengthening and Extension) due to the construction of the 132kV line, the expansion of 33kV lines, and the construction of new substations, transformers and feeders. The scale of involuntary resettlement will

Photovoltaic power plant in the Indian Ocean archipelago. The 18 MWp facility will be built in the Makunduchi area, southeast of the main island of Unguja. The state-owned company Zeco will also build an interconnection line to the grid, at a total cost of $16.5 million.

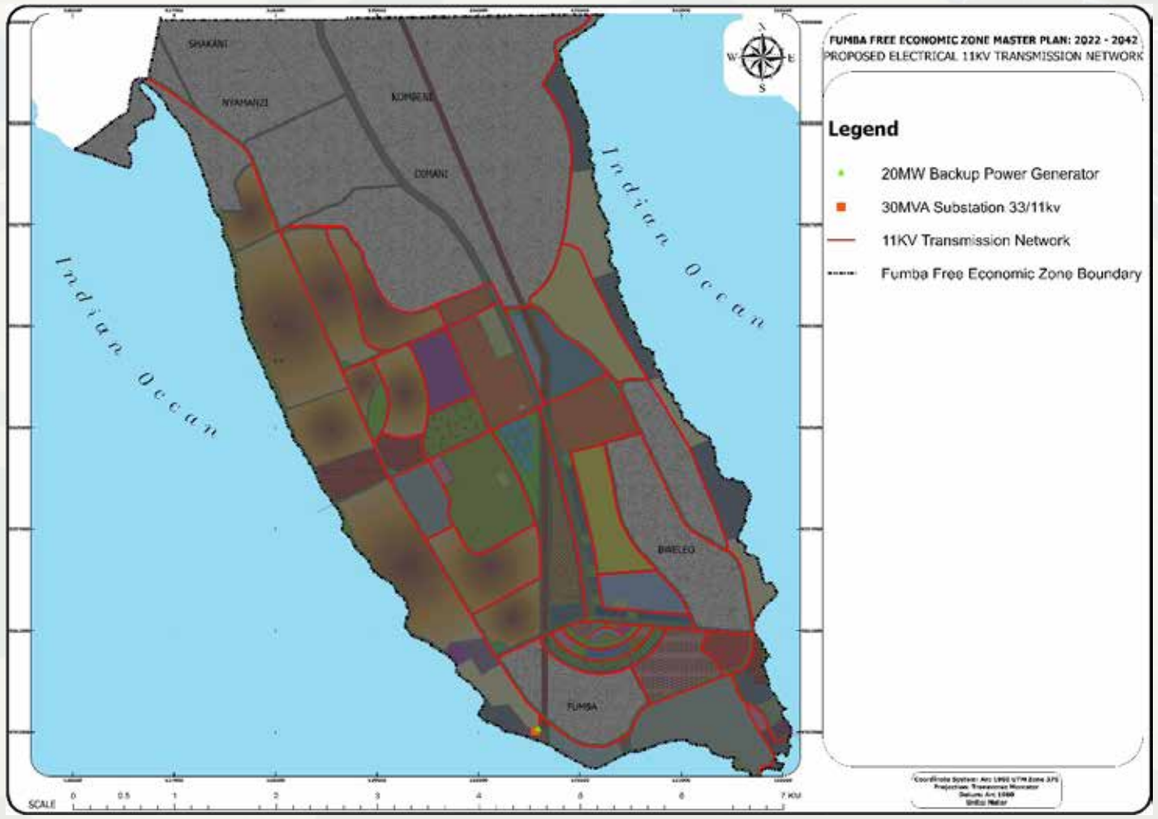
Power grid modernization

ZESTA is also upgrading the Unguja power grid. According to the local authorities, this other project component will improve the reliability of electricity supply, reduce losses and extend access to electricity to unserved communities and vulnerable households. ***"Investments under this component are also expected to increase household resilience to climatic events such as floods and pandemics such as Covid-19,"***says the World Bank.

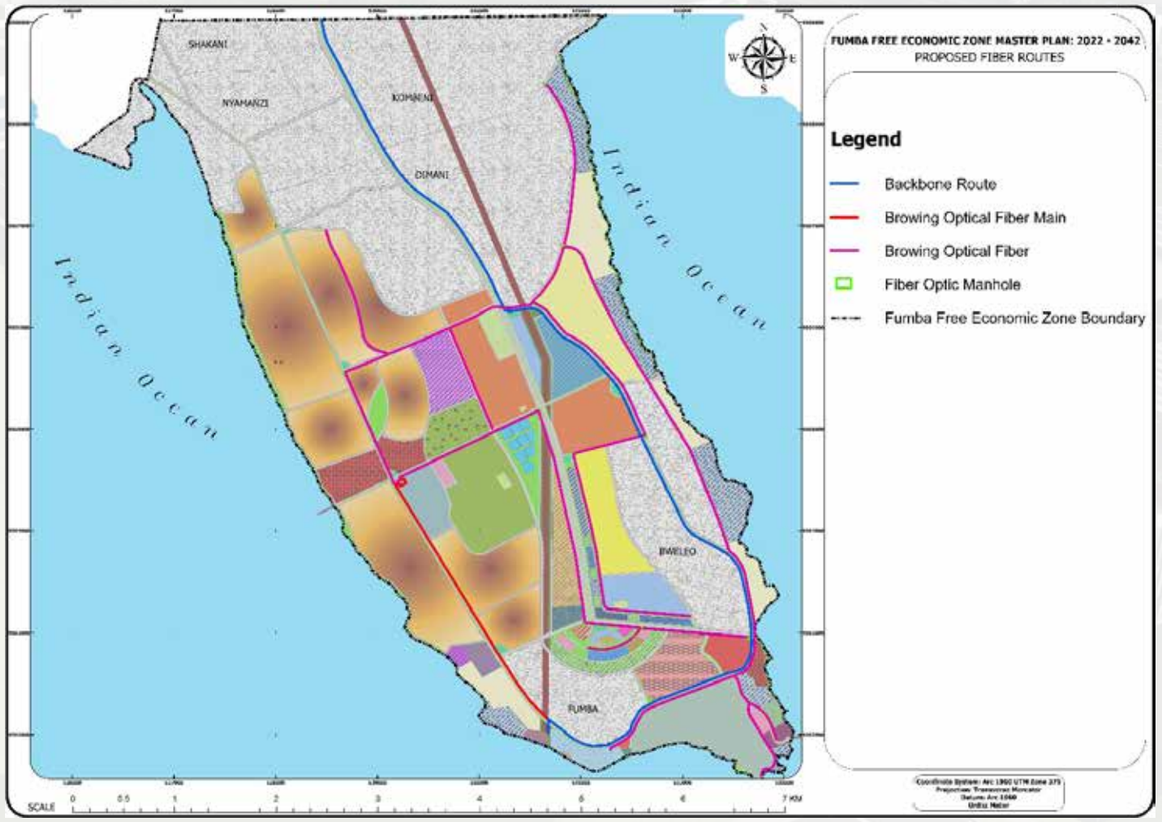
The Washington, D.C.-based financial institution is also supporting the construction of the first 132kV high-voltage transmission backbone infrastructure, including 100km of transmission line between the north and south of Unguja, to evacuate power from the solar photovoltaic plant, and to allow for the future integration of power generation to meet the growing demand for electricity on the island.

Underground power supply network is proposed in Fumba Smart City. In general, the proposed electrical 11Kv transmission network is presented in Map 7.2

Map 7. 7: Proposed Electrical 11kV Transmission Network



Map 7. 8: proposed fiber routes



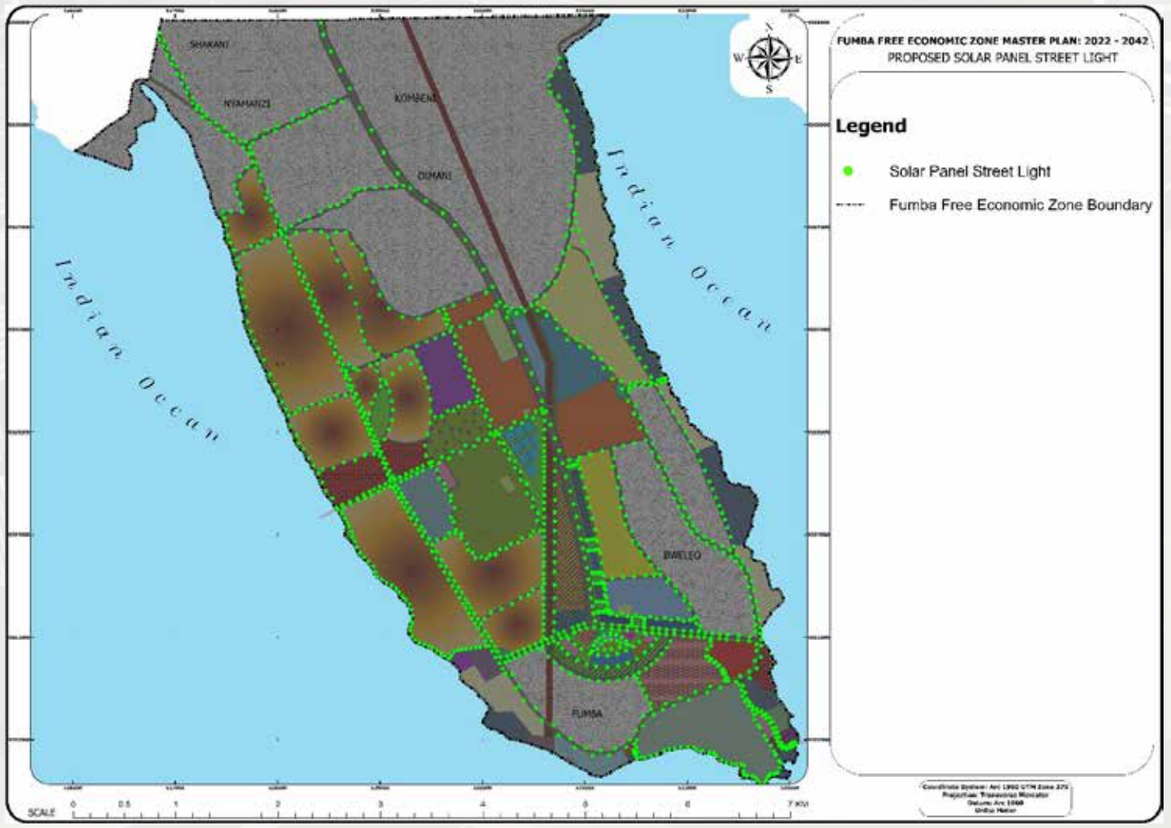
7.5 Proposal for ICT Infrastructure at Fumba Free Economic Zone

With the envisaged Smart City development at Fumba Free Economic Zone, there should be an establishment of high-tech ICT systems that will make Fumba Free Economic Zone an ICT City. Security systems, internet connectivity and mobile telecommunication would be given priority ICT Infrastructure Development. All customers for the internet connectivity will be subscribed via the extension of the existing optical fibre cable. All optic cable extensions will be terminated at Fumba Hi tech proposed building then to the local routes and to all buildings and small-scale industries located within this Fumba Free Economic Zone. Proposed fiber routes are shown in Map 7.4.

7.5.1 Security Systems and Internet Connections

The Fumba Free Economic Zone will accommodate various urban functions including Institutional centers, hotels, recreational facilities, health care facilities, educational facilities and training centres, wide range of residential houses, etc thus the security systems of these areas should be very high, the area will be equipped with CCTV cameras all over streets (Map 7.3). Main roads will be having CCTV cameras to monitor day to day movements, these cameras would be connected to the overhead optical fiber cable for Data collection. Street lights would be connected with LED Screens for advertisements so that no need of big structures with huge posters and these adverts will be connected into server so that any additional or any controls of the adverts will be done remotely at control room. The optical fiber should run through out to Institutional centers, hotels, small scale industries, hospitals, schools. This cable has advantage in internet speed and also not easy for the systems to be hawked.

Map 7. 9: Proposed solar panel-street lights



Government billing systems and TAXES Should be integrated online to avoid unnecessary time waste. All data have to be fed online from both sides' customers side and to the government official's side.

In Fumba Smart city there should be constructed a centralized high tech Data center for Data storage and back up. In some of the sensitive selected areas there should be emergency alarm system installed at the street light poles, where these alarms when there is a problem from that street anybody can press button for getting Emergency help from the police stations. That means all police posts and station around the ***Shehia*** have to be well equipped with control rooms that are well equipped with different security information's.

Important public areas such as school, hospitals, colleges, play grounds and government offices should be well equipped with free Wifi to easy various operations that requires online operations. e-Banking would be introduced into the area, since it is the ICT town with availability of internet connectivity, people don't need to do some purchasing moving with cash. ATMs might be installed in various places.

7.5.2 Telecommunication

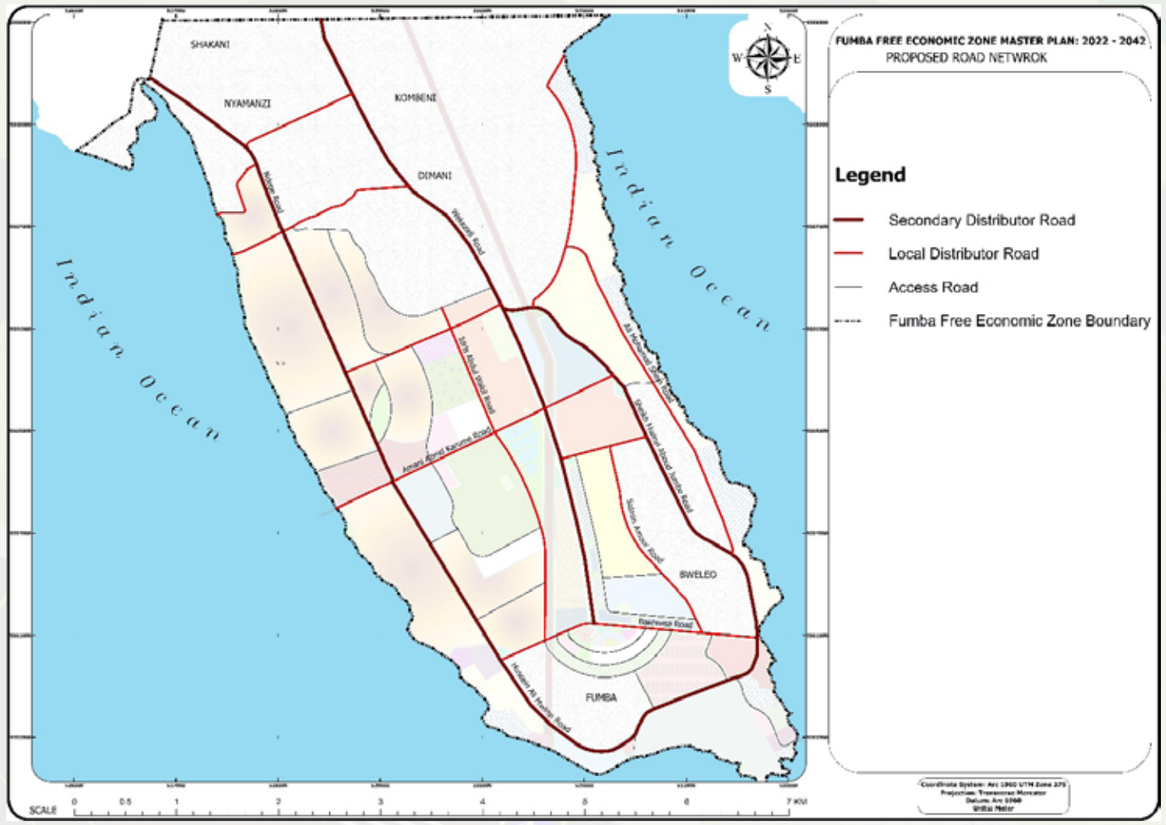
Zantel is the mail telephone operator in Zanzibar, with this master plan we propose other operators to introduce their network systems in Fumba Free Economic Zone in order to provide various choices to customers around the region and improve accessibility to mobile communications.

7.6 Proposal for Road Network

Although significant efforts for improvement of road network in Zanzibar Town has been given top priority, the town experiences poor transport system. Among others, poor urban transportation system constrains urban development and also the tourist sector which accounts over 25% of the Zanzibar GDP. Transportation has also major impact on spatial urban development in Zanzibar Town. For instance, 87% of all buildings built between 2004 and 2020 are within a one kilometer distance of public transport. However, the current road network does not adequately support non-motorized and public transportation. Most public transport buses are relatively small (minibus) and overcrowded especially during peak hours. Collectively, they lead to high emission of air pollution. Low transportation mobility rates result in low socio-economic mobility and vice versa. Investment in public transport will promote the transportation mobility rates and detract this cycle. This situation spin-off to the wider national economy if not urgently addressed.

This Master Plan proposes provision of Bus Rapid Transit (BRT) that traverses the Central Area of the Free Economic Zone, bisecting it into two almost equal parts from South-East to North West. This central Spain Road will promote massive public transportation and facilitate the balanced land development of the Fumba Free Economic Zone. Proposed road network is shown in Map 7.9.

Map 7. 10: Proposed Road Network



Live example of BRT from Dar es Saalaam which is similar to the BRT corridor proposed in this Master Plan is shown in Figure 7.5.

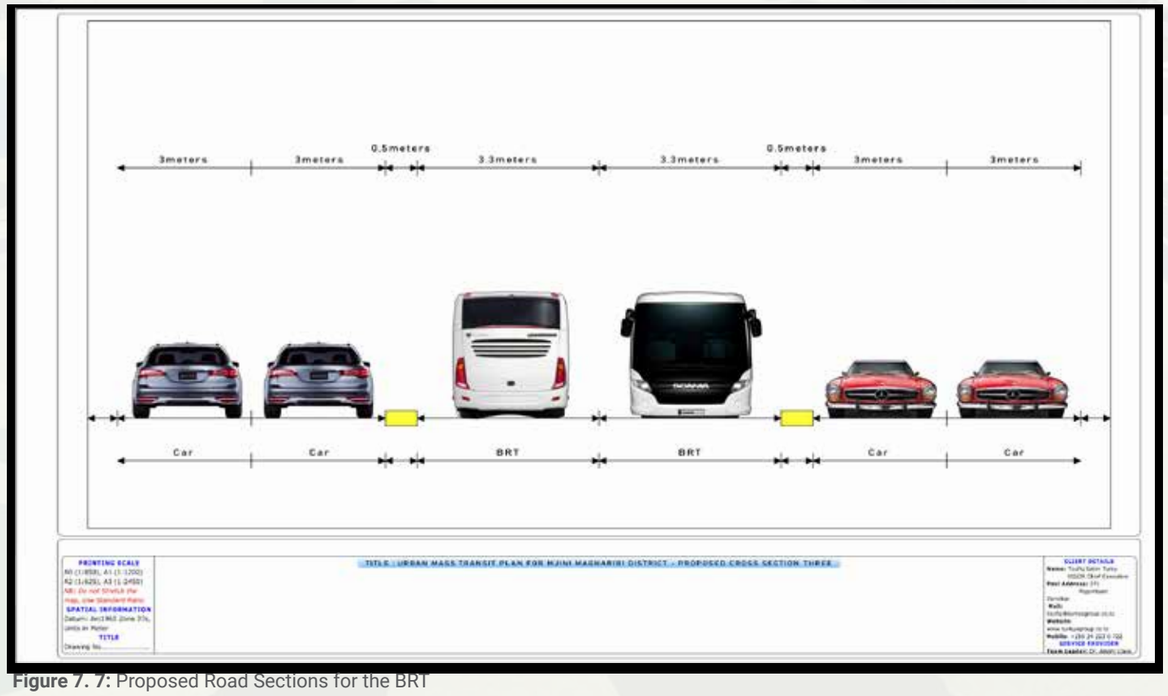


Figure 7. 7: Proposed Road Sections for the BRT

Plate 7. 10: Live example of BRT (extract from Dar es Salaam)

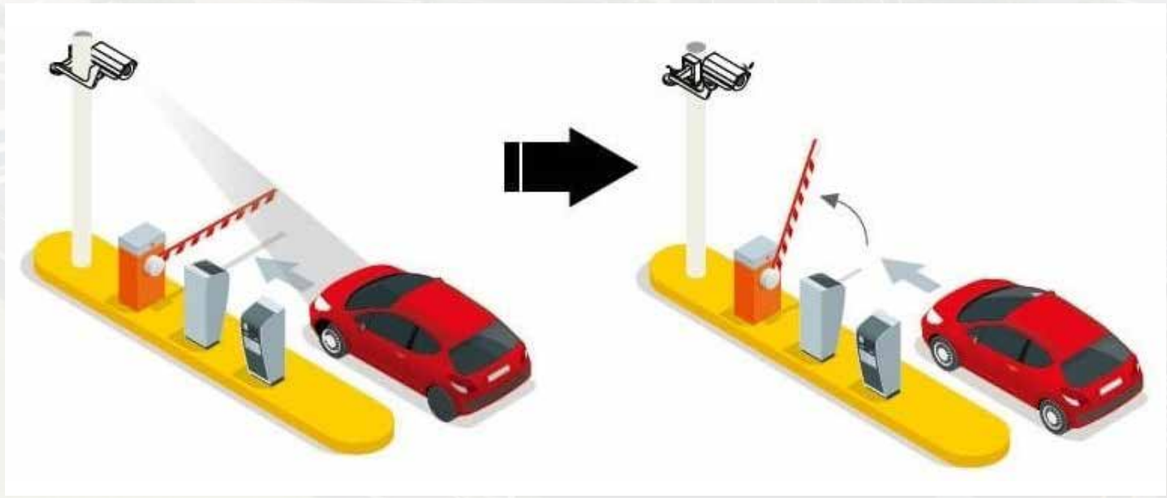


Plate 7. 11: Proposed CCTV camera configuration

7.7 Parking Facilities

Common car parking lots are proposed in all lots. In total an area of 7.14 Ha (71,400 m^2) is proposed for car parking for commercial purposes. The collection of entrance fees and service requires introduction of CCTV-camera and a control centre. The camera captures a plate number and send it automatically to the control centre to initiate the billing process. Plate 1 and Plate provide an example of how the car is automatically registered for car parking fees to initiate the billing process.

The owner of registered car will receive an instant bill in form of a phone SMS. The bill will require the owner to pay the entrance fees within a specified time. Proposed car parking facilities are presented in plates Three forms of car parking Therefore, the car parking lots will be one of the potential areas for income generating.

Plate 7. 12: Proposed underground car park in malls

Plate 7. 13: Proposed car park in housing estates and apartment

Plate 7. 14: Proposed multistory car park in sport centre, conference and exhibition centre

Figure 7. 6: Proposed Land Use Distribution and development conditions

Proposed investment zones	Area (m^2)	Development conditions
Beach Villas	725,400	-Must plant trees along the front road and within the plot -Must submit a Master Plan for the development of the area cluster/ lot which comply with planning and space standards -Must not exceed height G+2 -High-end residential houses and related activities -Plot size 1,200m^2 for each building
Housing Estate and Apartments for High Density	428,000	-Must plant trees along the front road and within the plot -Must submit a Master Plan for development of the area cluster/ lot which comply with planning and space standards -Unmetered parking spaces -High density height must not exceed G+8 -Medium density height must not exceed G+4 -Low density height must not exceed G+2 -Must have detached, semidetached, row houses and apartments buildings
Housing Estate and Apartments for Medium Density	562,800	
Housing Estate and Apartments for Low Density	28,400	
Real Estate	4,671,300	
Bus Terminal	21,400	-Must plant tree inside the terminal and outside along the road
Commercial zone for Shopping Mall	32,800	-Must plant trees along the front road and within the plot -Must submit a Master Plan for development of the area cluster/ lot which comply with planning and space standards -Must have smaller open spaces within the cluster
International Conference and Exhibition Centre	92,000	
Offshore Financial Centre	241,200	
ZIPA Business Tower	602,00	
Cyber City	245,000	
Medical City	326,900	
University Lot 1	512,300	-Must plant trees along the front road and within the plot -Must submit a Master Plan for development of the area cluster/ lot which comply with planning and space standards
University Lot 2	415,000	
Secondary School zone	126,000	
Vocational Education Training Centre	338,000	
Government City	702,000	-Must plant trees along the front road and within the plot which comply with planning and space standards -Must submit a Master Plan for development of the area cluster/ lot which comply with planning and space standards
Commercial zone for Furniture	14,300	-Must plant trees along the front road and within the plot -Must submit a Master Plan for development of the area cluster/ lot which comply with planning and space standards -Must have smaller open spaces between one commercial cluster and another

Commercial zone for Hardware	11,400	
Commercial zone for Hotels and Lodges	751,700	
Commercial zone for mixed use	346,800	
Commercial zone for Woolworth supermarket	24,100	
Commercial zone for Retail Shops	238,000	
Commercial zone for small scale food vendors	9,100	
Show rooms	45,200	
Parking Facilities	71,400	-Must plant trees along the front road and within the facility -Must have multiple story automated vehicle parking system
Deep Sea Fishing Marine Science and Technology	134,200	-Must plant trees along the front road and within the plot -Must submit a Master Plan for development of the area cluster/ lot which comply with planning and space standards
Sea Port	41,200	
Fish Market	10,200	
Fire Station	10,100	-Must plant trees along the front road and within the plot
Azam Dairy Milk	72,100	-Must plant trees along the front road and within the factories -Must be low or not any noise, air and water pollution
Fiber Glass Factor	33,100 -	
Light Industry	282,500	
Religious Facilities	600	-Must plant trees along the front road and within the plot
Garden	10,300	-Must have indigenous trees and fruit trees and vegetables as stated in the Master Plan -Must have trees with large foliage for shades -Must accommodate areas for active and passive sports as stated in this Master Plan -Must have designated walkways
Natural caves	118,200	
Open Space	1,875,700	
Fumba Park/Garden	39,700	
Green Belt	130,100	
Recreational Centre	670,000	
Horticulture (trees fruits, vegetables, flowers and nursery for various species)	216,800	
Urban Farming	109,700	
Recreational Centre	670,000	
Fuel and Service Station	43,700	-Must plant trees along the front road and within the plot
Shehia Area	10,937,300	-Must have physical boundary -Village Land use Plan must be prepared
KMKM	52,600	-Must plant trees along the front road and within the plot or along the HT power line -Road network must have solar street lights -Electrical supply must be underground to optimize space use and improve safety and security -Road network must follow road hierarchy
Police Station	9,000	
Power Station	269,000	
Solid Waste Collection Point	7,100	
Storm Water Collection Facility	134,900	
Waste Water Treatment Plant	11,700	
Road network	822,100	
High Tension Power Line	402,500	
Total Area	**27,454,100**	

IMPLEMENTATION PLAN AND COSTING

CHAPTER EIGHT

IMPLEMENTATION PLAN

8.1 implementationPlan

The Vision of Zanzibar Investment Promotion Authority (ZIP) is to make Zanzibar an attractive and competitive investment promotion regionally and globally. The implementation of this Master Plan for Fumba Free Economic Zone translate significantly that vision into reality. In order to implement the Fumba Free Economic Zone Master Plan 2022-2042, stakeholders' consultation and participation to yield collaborative efforts to implement proposed development projects are required. Mobilization of resources within and outside the public sector is necessary establish facilitative infrastructure such as roads, water supply, liquid waste disposal, solid waste management facilities, power supply network, storm water drainage system and ICT infrastructure. Establishing such infrastructure will attract investors to invest in Fumba Free Economic zone. Such development projects belong to the government.

Implementation of the Master Plan also requires committed, strong and institutional focus leadership who will coordinate various local and international investors in the course of plan implementation.

8.1.1 Projects Development Procedures

Although the Executive Director is a custodian of the Fumba FEZ Master Plan, the consultant recommends ZIPA to establish a special committee that will be responsible to oversees the implementation process. It is recommended that the proposed projects be executed under the supervision of the proposed committee which will be under the chairmanship of the Executive Director. The members of the committee should be derived from the Investors, Land Commission, Utility Agencies, West B District Commissioner and one member from the grassroots leaders.

It is also recommended that after every five years ZIPA must conduct a review of master plan in order to check whether the proposed plan still meets the institutional vision and objectives. However, progress report should be reported to the ZIPA in each quarter to grasp, among others, dynamics, challenges and opportunities. In that way, ZIPA will find out whether there is a need to change or recommend innovative approach to improve implementation of the master plan.

In developing project(s) related to infrastructure within the Free Economic Zone, the following aspects should be considered:

- Planning
- Resource Mobilization and Acquisitions
- Detailed Design and Cost Estimates
- Construction and supervision
- Commissioning

Project Planning

Project planning should be considered as prerequisite for project implementation process. Project planning stage will consider site visits, detailed feasibility studies and developing initial project costs to assist the initiation of resource mobilization. The detailed feasibility studies will investigate and analyzed, demand for project, checking political, technical and economic validity, annual capital investment plan and return plan. This step may entail change in land use plan or development phases. All development will also adhere to the Environment and Social Impact Assessment (ESIA) report prepared by separate consultant.

Resource Mobilization

Basically, Resource mobilization is related to all activities involved in identifying the current available resources, securing new/additional resources for development projects at the Free Economic Zone at Fumba. It also involves planning the better use of, and maximizing, existing resources. Resource mobilization is necessary step in implementation of the master plan. Therefore, successful implementation of the proposed development project (s) in the Free Economic Zone depends on the ability of the ZIPA and the RGoZ at large to mobilize required resources especially for infrastructure development to enable investments activities. Provision of infrastructure such as water supply, power supply, sanitation system, ICT, road network and storm water drainage system is pre-request for investment promotion. Investors will prefer areas where basic infrastructural facilities are available and reliable.

Detailed design and Cost Estimates

This process includes preparation of detailed design and working drawings and other building documents, preparation of detailed quantities and respective cost estimates. As these are detail designs documents before constructions begins on the site, it is important to ensure value for money thorough engineering economic analysis studies. Construction cost for the proposed project can be minimized at this stage while ensuring value for money the project (s).

Construction and supervision

This stage needs carefully planning ensuring that all process does not affect other ongoing activities at the Free Economic Zone. The main activities may entail site preparations, including those cuts and fills, actual layout of building or infrastructure. This is typically engineering works including earth works, water services networks, sewerage networks, culverts, landscape works, etc. It is suggested that construction work be done under supervision of relevant registered professionals.

Commissioning

Project commissioning stage is the process where the ZIPA will ensure that all systems and components of buildings are designed, installed, tested, operated, and maintained according to the operational requirements. In practice, the commissioning process is the integrated application of a set of engineering techniques and procedures to check, inspect and test every operational component of the project.

Implementation Strategy

The scale for implementing the development of the proposed land use for infrastructural facilities in the free economic zone is relatively large necessitating deployment of various financing and development methods. This section is intended to recommend some selected implementation methods for the proposed projects. Normally the implementation methods are based on financing mechanism and phasing as described in the subsequent section.

Financing Mechanisms

As discussed earlier, the implementation of the Master Plan requires financial resource mobilization from the public and outside the public sectors. The central budget appropriations, private sector, international development partners and national and international financial institutions as well as local fund mobilization at the Institutional level. However, it should be noted that investors require enabling environment for the investment to take place and generate profits. As such there are projects that are directly belong to the government and there are one that are left to the investors. The subsequent sections provide overall framework for fund mobilization as some project could be developed by both public and private sector in joint venture to improve public revenue generation. Other facilities that should be provided by the government includes Police Station, Fire Station, Fire hydrants, BRT bus terminal and Sea Port. Some of such infrastructural facilities can be developed by the government involving International Development Partners, local stakeholders' contributions in kind and cash.

a) Central Budget Appropriations

This is government's proposed revenues and spending for a financial year that is often passed by the legislature, approved by the chief executive or president and presented by the Finance Minister to the nation. The ZIPA may benefit from this source. Based on the significant number of strategic projects currently funded by the government, it does not give hope if this will be the best option to ZIPA or any other institution to rely on as only option. With this Current situation, it is proposed for ZIPA to look for other funding methods to implement the proposed master plan without relying fully to this option.

b) Public-Private Partnership

Due to the fact that resources are scarce, mobilization of the same from the private and public sectors is considered inevitable. The presence of the Public Private Partnership Act (2015) creates a framework for attracting private capital to develop, operate and maintain essential infrastructure and services. Such legal framework presents a conducive environment for the Public Private Partnership (PPP) arrangements to happen. The PPP for example has been identified as a viable means to effectively address constraints of financing, managing and maintaining public goods and services. Its adoption will therefore provide ZIPA to explore these and other related opportunities to steering the implement at ion process. Projects such as parking facilities, sport centre.

I t is envisaged that most of the proposed functions especially those with high returns are likely to attract private investors. In view of this potentiality, it is suggested that private investors participate fully in the implementation of the Master Plan. The level of participation will be determined by who pays for rent or type of investment. In this case, ZIPA should seek funds for construction of various buildings, effort s should be geared towards provision of facilities/services in the free economic zone.

The core issue in this category of Fumba FEZ Master Plan is the development of new facility and its ownership overtime. Focus is on design and construct ion of required new facilities, and hence emphasis on the terms: construction, operations and ownership. The resulting options include: Design and Build (DB); Design Build and Operate (DBO); Build, Operate and Transfer (BOT); Build, Lease and Transfer (BLT); Design, Build, Finance and Operate/Maintain (DBFO/M); Build, Own and Operate (BOO); and Buy, Build and Operate (BBO).

A good example of PPP includes Build Operate and Transfer (BOT) mode, by which the ZIPA can enter into agreement with private investors to build a particular facility, operate the facility for agreed duration to recover costs and finally transfer the ownership of the facility to ZIPA. Possible facilities include banking facilities, shopping mall/commercial complex, medical city, real estate development to mention a few.

c) Government Trading Enterprises

The Government Trading Enterprises (GTE) are government -owned or government -controlled entities that are mainly engaged in the production of goods and services, with the requirement to substantially or fully cover their costs. They are outside the general government sector and are also separate from the Government financial enterprises (in the banking, insurance and related sector). GTEs are also commonly referred to as: GBEs (government business enterprises); GOCs (government -owned corporations); PTEs (public trading enterprises); Public Corporations; SOCs (state-owned corporations); SOEs (state-owned enterprises); or TOCs (territory-owned corporations).

The Government of the United Republic of Tanzania through its Treasury Registrar owns shares and interests in 214 public parastatals. Companies and statutory public enterprises do not compete under the same terms and conditions as private enterprises because they have access to government subsidies and other benefits. The GTEs are active in the power, communications, railway, telecommunications, aviation, and construction and port sectors. GTEs are not subjected to hard budget constraints. This may serve as one of the best option for ZIPA to implement the master plan. The Central Government insists of GTE's to assist in public project or joint venture with government institutions. The ZIPA may benefit with this plan.

d) Financing through Development Partners

ZIPA may use the official development assistance, which is the fund that government of other countries offer financial supports to governments of developing countries for the purpose of economic development and cooperation. Good examples include the financial supports from the World Bank, the Swedish International Development Cooperation Agency (SIDA), Loan Portfolio from developed countries such as Poland, Denmark, Germany to mention a few. Assistance includes grants, aids, technical support, concessional loan and other items. Assistance funding is usually offered on more favorable terms than other sources of revenue.

e) Local Fund Mobilization

ZIPA must set aside its own fund from internal sources to be part of master plan implementation strategies. Fund from land rent from all investors in free economic zones may act as reliable source for constructions and maintenance of the infrastructure.

Proposed Development phases

Implementation of the master plan will be done in phases for the realistic resource utilization. Setting priority and identification of short, medium- and long-term projects is therefore a necessary step towards plan implementation. It is worth noting that the project s will also be implemented in phases depending on the magnitude of the Implementation of the master plan will be done in phases for the realistic resource utilization. Setting priority and identification of short, medium- and long-term projects is therefore a necessary step towards

plan implementation. It is worth noting that the project s will also be implemented in phases depending on the magnitude of the resources required and existing demand.

Implementation of the Fumba Free Economic Zone Master Plan 2022-2042 is expected to take 20 years. Implementation program is divided into three phases. The first phase is set for five years (2022-2027) while the second phase covers the period of ten years (2027-2037) and third phase is set for five years (2037-2042). The first phase includes campus inaugurations, site clearance, resource mobilization and installation of infrastructural facilities and road network. The first phase is for satisfying the demand; the second and third phases make the free economic zone self- sufficient and maturity respectively. The first phase forms the basic framework for the development of the envisaged new smart city in the free economic zone. Open up proposed roads is pre-request for commencement of land development by investors. It has been noted that transportation has major impact on spatial urban development in Zanzibar Town and elsewhere. For instance, 87% of all buildings built between 2004 and 2020 are within a one kilometer distance of public transportation corridors. Therefore, investors and other land developers will always invest or develop in areas that are accessible by vehicular roads to facilitate transportation of goods and services.

The second phase covers water supply and waste water sewerage system and treatment facilities. It also involves the installation of streetlights and CCTV camera. The third phase covers establishment of Marina in three areas, construction of police station and fire station.

8.1.2 Estimated Annual Income for rental spaces

The projected annual income from land rent excluding public spaces, circulation systems, green belt, bus-terminal, spaces for public utilities, government city and spaces designated for public administration buildings. The total income when the entire site is full developed is estimated at USD 6,250,600 which is equivalent to TZS 14,563,898,000.00

Table 8. 1: Indicative annual income from land rent[1] in Fumba Free Economic Zone.

S/N	Functional requirements	Space in square meter (m^2)	Income	
			USD	**TZS[2]**
1	Cyber City	245,000	245,000	570,850,000.00
2	Offshore Financial Centre	241,200	241,200	561,996,000.00
3	Medical City	326,900	326,900	761,677,000.00
4	Sport City	670,000	670,000	1,561,100,000.00
5	University Lots (2 lots)	927,300	927,300	2,160,609,000.00
6	Shopping Mall and Conference and exhibition centre	46,000	46,000	107,180,000.00
7	Housing Estate and Apartments	1,229,200	1,229,200	2,864,036,000.00
8	Beach Villas	725,400	725,400	1,690,182,000.00
9	Beach hotels and lodges	751,700	751,700	1,751,461,000.00
10	Supermarket for electronics devices	33,500	33,500	78,055,000.00
11	Furniture Centre	14,300	14,300	33,319,000.00
12	Hardware Centre	11,400	11,400	26,562,000.00
13	Commercial Food Vendor Square	9,100	9,100	21,203,000.00
14	Woolworth Supermarkets	24,100	24,100	56,153,000.00
15	Showrooms	45,200	45,200	105,316,000.00
16	Zone for complex and mixed uses	346,800	346,800	808,044,000.00
17	Fish Market	10,200	10,200	23,766,000.00
18	Light Industry (micro-small scale value addition industries)	282,500	282,500	658,225,000.00
19	Fumba Forodhani- Central Park	39,700	39,700	92,501,000.00
20	Fuel and Service Station	33,100	33,100	77,123,000.00
21	Whole Sale Shops	238,000	238,000	554,540,000.00
	Total	**6,250,600**	**6,250,600**	14,563,898,000.00

1 Annual land rent per year in Fumba is USD 1.0 for land between 1-5 Ha and 1.0 for land above 5 Ha
2 1 USD is equivalent to 2,330


Parque de Golf

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