



# **ZANZIBAR RESEARCH AGENDA 2015 - 2020**



## **PREFACE**

The Revolutionary Government of Zanzibar (RGoZ) is cognizant of the pivotal role of research in socio-economic development and human well being. The application of credible research findings generates innovation and subsequently wealth intended to realize socio-economic development of the Zanzibar society. The RGoZ has committed to harnessing the benefits of research and innovation using a people-centered, enabling environment, development agenda approach to ensure attainment of the Zanzibar Development Vision 2020.

Strategic focus on researchable areas that realize the Development Vision 2020 and complement other development strategies enables cost effective allocation and utilization of the existing resources. The RGoZ, with support from the Swedish International Development Agency (Sida) through the Tanzania Commission for Science and Technology (COSTECH), has drawn up the Zanzibar Research Agenda (ZRA) which maps out the focus of research and innovation for the next five years that is, 2015 – 2020.

RGoZ strives to build a society that utilizes scientific evidence to inform its policy and decision-making processes. The benefits of this have been demonstrated whereby there have been savings in government expenditure following research that enabled eradication of Tsetse flies in Zanzibar among other achievement. The ZRA is expected to ensure that RGoZ benefits many more high and broad impact results are achieved in the given period.

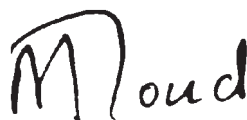
The ZRA was drawn up in a consultative process with a broad base of stakeholders including researchers, scientists, innovators, decision and policy makers whose commitment and effort in delivering this document is highly commended. At least seven stakeholders' workshops from sectoral to national level were held to discuss the draft ZRA, including a Revolutionary Council meeting chaired by His Excellency the President of Zanzibar and Chairman of Revolutionary Council Hon. Dr. Ali Mohamed Shein, which unanimously approved

and endorsed the final draft to be incorporated into the Zanzibar Development Plan.

Readers will note that the ZRA emphasizes key sectors of Agriculture, Livestock, Fisheries, Food Security and Nutrition, Climate change Environment and Conservation, Land Management and Human Settlements, Energy, Health, Water and Sanitation, to mention just a few.

The ZRA is credited to a group of individuals from Zanzibar that championed this document together with their counterparts on the mainland and as such this is their legacy to the larger research and development community. The ZRA strives for high quality, equitable, and environmentally sustainable science, technology and innovation initiatives to be implemented all over the country. It is my hope that these research priorities will contribute to transforming our economy and strengthen the culture of using research evidence in formulating various policies and strategies. The support from Sida and COSTECH are likewise deeply appreciated.

Finally, on behalf of the Government let me take this opportunity to welcome you to partner with Zanzibar in conducting and implement the outlined research for the betterment of our country.

A handwritten signature in black ink, appearing to read 'Moud' or 'Moud', with a stylized, looped initial 'M'.

Zanzibar, 2015

Hon. Mohamed About Mohamed  
Minister of State, Second Vice President's Office.

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## LIST OF ABBREVIATIONS

COSTECH	Tanzania Commission for Science and Technology
COHRED	Council on Health Research for Development
ECD	Early Childhood Development
GBV	Gender Based Violence
GDP	Gross Domestic Product
GNU	Government of National Unity
HBS	Household Budget Survey.
HIV	Human Immuno-deficiency Virus
ICH	Intangible Cultural Heritage
ICT	Information and Communication Technology
ILFS	Integrated Labor Force Survey
KWh	Kilo Watt hour
LMI	Labor Market Information System
LPG	Liquid Petroleum Gas
m <sup>2</sup>	Meter Square
MDAs	Ministry Departments and Agencies
MDGs	Millennium Development Goals
MFIs	Micro-Finance Institutions
MKUZA	Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Zanzibar
MMH	Mnazi Mmoja Hospital
MoH	Ministry of Health
MPAs	Marine Protected Areas
NCDs	Non-Communicable Diseases
NGOs	Non-Governmental Organizations
NRA	National Research Agenda
OSH	Occupational Safety and Health
PPPs	Public Private Partnerships
PwD	People with Disability
R&D	Research and Development
RGoZ	Revolutionary Government of Zanzibar
SMEs	Small and Medium Enterprises
TB	Tuberculosis
ToT	Training of Trainers

TZS	Tanzanian Shilling
VAWC	Violence Against Women and Children
ZBS	Zanzibar Bureau of Standards
ZECO	Zanzibar Electric Company
ZRB	Zanzibar Revenue Board
ZSGRP	Zanzibar Strategy for Growth and Reduction of
Poverty	

# **ZANZIBAR RESEARCH AGENDA 2015 - 2020**

# CHAPTER ONE

## INTRODUCTION

Major developments in various sectors are likely to present both opportunities and challenges in the overall development of Tanzania. It is becoming increasingly apparent that well-targeted and good quality research which addresses sectoral challenges is needed to inform policy and decision-making processes for sustainable development. Research plays a very crucial role in the socio-economic development of any society. It can lead to the improvement of the quality of people's lives e.g. by increasing life expectancy, enhancing agricultural productivity in critical productive sectors of the economy for improved livelihoods and food security, and developing technologies that would simplify people's lives. The contribution of research in development cannot be over emphasized. At the institutional level, research can bring about product innovations and improvement, improved performance in product marketing and increased service efficiency and effectiveness.

It is for this reason that the Tanzania Commission for Science and Technology (COSTECH) set out to fulfill one of its mandates by developing the National Research Agenda through in-depth consultations and participation of research stakeholders in the country. The agenda document intends to guide the planning for research programs, projects and activities in the country. It focuses on national research priority areas and possible themes, giving direction to managers at all levels, researchers and the academia as well as development partners as they plan and fund their related research activities. The agenda provides evidence necessary for decision-making in line with national priorities. Research and Development institutions and other stakeholders are therefore expected to plan, undertake and promote research that is in line with the research agenda with the intention of delivering quality evidence for matters of national priorities.

A research agenda by necessity prioritizes, and the need to prioritize arises from the fact that resources are always scarce, although there is always demand for good quality research which addresses sectoral challenges to inform policy and decision-making processes for sustainable development. The identified research priorities together with those of Tanzania mainland identified in 2011 will be an input for the formulation of the National Research Agenda (NRA).

The main objectives of the exercise include:

- Producing an inclusive and comprehensive NRA that all research stakeholders will subscribe to;
- Aligning the R & D efforts with national goals;
- Improving the effectiveness of R & D in Tanzania by setting realistic targets to address issues presented in the National Five Year Plan;
- Guiding the allocation of R & D resources from the Government and other sources;
- Creating the participatory platform for shaping the direction of R & D in the country and therefore enhancing its contribution to the economy;
- Promoting the culture among research stakeholders of conducting demand-driven research that addresses issues of national socio-economic importance.

## **1.1 METHODOLOGY**

The choice of methodology for foresight related exercises depends on financial and time resources, expertise availability, experience and sometimes what is fashionable. For the case of this NRA, the availability of technical support, expertise, relevant stakeholders, dynamism required for integrating multiple sectors and the level of financing for the exercise were among the key drivers for the choice of the COHRED approach, which was selected and customized for all sectors. The approach has been widely used in the health sector in Tanzania for more than 10 years. In its standardized form, approach involves the following steps;



### **1.1.1 Situational Assessment of the Sector**

This involved assessment of what is known (current status) in terms of the National Perspective. The status was derived based on the knowledge from representative(s) of the relevant sector, brief overviews of current research emphasis and advances, discussion on collaboration, resource-sharing, linked studies and programs. Ultimately, the stakeholders listed at most ten (10) researchable areas which were presented in the plenary.

### **1.1.2 Priority Setting Stage**

The priority setting stage involved rating and ranking in which the identified priority areas were rated individually using 5 assigned criteria with values 1 to 5; 1 being the lowest and 5 being the highest. The criteria for ranking were:

- Appropriateness as determined by ethical and moral issues, availability of pre-existing data and cultural acceptance;
- Relevance based on equity and community concern/demand, the size of the problem and contribution to the national and sectoral objectives;
- Feasibility which looked at capacity of the system to support the research, the cultural/political environment, and the availability of physical, financial and human resources;
- Impact of research outcomes, related to opportunity to implement the research, use of the research results, link of the research to policy decisions and overall reduction of the problem, including cost;
- Opportunity to strengthen collaboration with partners, assessing the availability of capable partners and partner infrastructure and resources, and the potential of greater research outcomes with partner involvement.

## **1.2 PRIORITY SETTING PROCESS**

The priority setting process comprised:

- Preparatory Workshop for Research Priorities Setting.
- Training of Trainers (ToT) Workshop for research priority agenda setting.
- Sectoral workshops for Identification of Researchable Priority Areas.

### **1.2.1 The Preparatory Workshop for Priorities Setting**

The preparatory workshop for setting the research priorities was held in Zanzibar from 12th to 15th March 2013. The participants were research experts from COSTECH as leaders of the process, senior officials from the First Vice-Presidents' Office, Second Vice Presidents' Office and Planning Commission of Zanzibar. The significant output of this workshop was an extraction and interpretation of national priorities for development as spelt out in various national documents including MKUZA I and II. The identified sectors were the productive services, social services, and the economy and governance. Twenty (20) subsectors were drawn from the 3 main sectors.

The priorities obtained would be used for identifying the research issues. This approach was a little different from that used in a similar exercise in the mainland, in which sectoral stakeholders drew up more than 700 research issues, thus making it a little difficult to consider them as priorities. In Zanzibar the approach was to focus more on already identified national priorities.

### **1.2.2 Training of Trainers Workshop for Research Priority Agenda Setting**

Training of trainers is believed to be one of the most cost effective ways to train a large number of intended participants. Having conducted ToT courses, you can have confidence that your subsequent trainee would be trained effectively in the areas vital to their specific subject of interest.

The ToT workshop with 16 participants was held for three days starting from 23rd April 2013. Participants were drawn from ministries leading different sectoral institutions including health, agriculture, energy, planning, and industries and trade.

#### **The objectives of the ToT were;**

- i. To explain the components, process and tools of a standardized approach to setting research priorities across sectors for use as an input to the NRA.

- ii. To teach the steps and application of tools in the standardized approach in order to facilitate a within-sector priority setting exercise.
- iii. To understand how this process will contribute to subsequent sectoral workshops which will focus on establishing priority issues from the relevant sectors.

As a result, the following outcomes were realized from the workshop:

- The facilitation techniques were learned
- The facilitation techniques and tools was provided to the trainees
- The development priorities were also presented as stipulated by the Zanzibar Strategy for Growth and Reduction of Poverty (ZSGRP)
- A list of stakeholders to be consulted and represented in the process was drawn up
- The trainees assisted facilitation during their respective sectoral workshops under the close supervision of COSTECH facilitators.

### **1.2.3 Workshops for Identification and Validation of Researchable Priority Areas**

Eight workshops for the identification and validation of research priority areas were conducted between May 2013 and June 2014, as shown in the table in Annex 1. The stakeholders involved in the workshops included representatives from the Revolutionary Government of Zanzibar, research and development (R&D) institutions, universities and training institutions, extension and research beneficiaries, Non-governmental Organizations (NGOs), Community Based Organizations (CBOs) and the private sector. For each sub-sector, a maximum of 10 stakeholders were invited.

## CHAPTER TWO

### SECTORAL RESEARCHABLE AREAS

The identified research areas reflect analysis that shows the current status of the sector, the target of the sector by year 2020 and what research needs to be done to realize the set targets. The researchable areas are listed in ascending order of prioritization. The ranking for each sub-sector is attached in the appendix.

#### 2.1 Agriculture

The agricultural sector targets are in line with the sectoral and overarching policy frameworks including MKUZA II which aims at meeting the country's development goals. The sector contributed an average of 30.2% of the total GDP by the year 2012; this is attributed to its dominance in foreign exchange earnings which currently accounts for over 70%. However, the country depends on limited agricultural commodities - cloves and seaweed - as primary export items.

Agriculture is also the most important source of employment in the Isles. On average, 70% of the population depends directly or indirectly on the agriculture sector for their livelihood. This implies that the sector has a high potential for dealing with the socio-economic challenges such as high levels of income poverty and food insecurity. Given the importance of the sector for the majority of the population, and as a base for foreign exchange earnings, the sector deserves adequate public and private sector investment for attaining and maintaining the anticipated growth rate.

The ranked researchable areas follow below:

- Soil, water management and irrigation systems
- Technological transfer and indigenous knowledge
- Clove and Coconut Production
- Crop protection

- Value addition and marketing systems Post harvest management
- Up-grading production of spices
- Crop genetic improvement
- Post harvest management
- Youth engagement in Agriculture
- Promote Public Private Partnership

### **2.1.1 Soil and Water Management and Irrigation Systems**

Soil and water management is very crucial for sustainable agricultural production. Moisture stress and decline of soil fertility are the major constraints for crop production in Zanzibar, associated with climate change, poor crop husbandry, excessive use of chemicals, poor conservation of catchment areas and deforestation. Only 10 percent of the available potential land (8,521 hectares) is exploited for irrigation; therefore there is a need to undertake research on sustainable soil and water management and an effective irrigation system. There is also a need to develop and engage in irrigation for high value crops such as horticultural production which employs the majority of women and youth engaged in Zanzibar's agriculture. More household research on home gardening systems should also be emphasized. By 2020 research on soil hydraulic conductivity and rain water harvesting along the System of Rice Intensification needs to be conducted.

### **2.1.2 Technology Transfer and Indigenous Knowledge**

The adoption rate of technology for improved agriculture in Zanzibar is still very low. Only 30 percent of the farming households have access to new and improved seeds. Therefore there is a great need to conduct socioeconomic research to study the factors constraining the adoption of improved agricultural technologies such as seeds, fertilizers, agrochemicals, and agro-mechanization. The target is to utilize agricultural improved technologies in at least 70% of rural farming by 2020. The research will look at the use of technology transfer through Farmer Field Schools (FFS) for adoption and documentation of technologies which are accessible or viable to the wider farming community.

### **2.1.3 Clove and Coconut Productivity**

Cloves and coconuts occupy a prime position in the history and agricultural system of Zanzibar. Cloves have been a major foreign exchange earner for the last one and a half century. However, production has been declining over the last four decades from an annual average of about 16,000 tons in the 1970s to between 1,500 to 4,800 tons in the early 2000s. Research topics that will be focused on, among others, are techniques to boost clove production to over 10,000 tons per annum by the year 2020, assessment of cloves in the pattern of transient income poverty and the production of coconut associated products for both the local and foreign markets in order to boost the local economy.

### **2.1.4 Crop Protection**

Crop pests, diseases and weeds cause great loss in crop production in Zanzibar. It is estimated that these pests account for an average crop loss of about 65%. Therefore, research on insect pests, disease and weed management is of paramount importance for increased production and productivity of crops. The aim is to reduce crop loss to at least 20% by 2020. New research will involve developing new technologies and options for crop protection and pest management using both conventional and biotechnological approaches.

### **2.1.5 Value Addition and Marketing Systems**

The value addition and marketing systems of the locally produced goods are at a very low level. There is a need to enhance competitiveness through agro-based industries and value addition throughout the supply chain and to develop the capacity to supply agro-processed products to respond to the new opportunities in the domestic markets. The aim is to increase agro-processing of the identified commodities from 10% to 30% by 2020. Research areas under this topic include the following:

- Factors constraining the development of agro processing entrepreneurs;
- Value chain analysis for rice and cassava;
- Profitability analysis for 10 value-added products;

- Factors constraining the linkage between tourism and local suppliers of fresh fruits and vegetables.

### **2.1.6 Post-harvest Management**

High post-harvest losses are one among the major constraints in agricultural productivity in Zanzibar. It is estimated that about 40% of the crop harvest is lost along the value chain. This is aggravated by poor crop handling. The cumulative average post-harvest loss for fruits goes up to 34%, while the pre and post-harvest loss for vegetables can be as high as 42% per year. The aim in this area is to reduce post-harvest losses to only 10 to 15 % by 2020. Research topics under this research area include:

- Identification of pests and diseases associated with post-harvest losses;
- Determining yield losses due to pre and post-harvest handling;
- Determining the shelf life and storability of crops and products and
- Determining the pre-harvest factors contributing to production harvest losses in cassava, rice and vegetables

### **2.1.7 Up-Grading Production of Spices**

Zanzibar's tropical climate provides ideal conditions for the production of many types of tropical fruits and spices. Thus Zanzibar has a high potential in spice production. About 40 tons of turmeric (fresh weight), 159 tons of cinnamon, 88 tons of chilies, 6 tons of cardamom, 44 tons of black pepper, 154 tons of ginger and 8.5 tons of vanilla are produced annually. However, there is very limited research work on improvement and development of the spice sub-sector in Zanzibar.

Research on new technological options to capture new and emerging niche markets is necessary. Research is also needed in extensive assessment of additional spices and fruits potentially suitable in coral rag areas and potential candidates for links with the expanding tourist markets.

### **2.1.8 Crop Genetic Improvement**

Productivity of indigenous crops is very low due to poor genetic potential of the available local cultivars. It is estimated that the yield of indigenous varieties of cereals is less than half of the potential harvest. For instance, cassava produces 5-8 tons per hectare while the potential productivity with improved varieties can be as high as 30-40 tons per hectare. The aim is to increase productivity by 50% through the introduction and development of new varieties with high genetic potential and use of traditional/indigenous seeds and knowledge. Research topics under this area include:

- Breeding new varieties of crops for disease and pest resistance;
- Breeding of crops for adaptability and yielding potentials;
- Application of biotechnology tools/techniques in plant breeding; and
- Introduction and evaluation of improved crop genotypes.

### **2.1.9 Youth Engagement in Agriculture**

The proportion of youth population engaged in agricultural activities is very low and unemployment rate was 19.6% in 2006. Youth involvement in the sector is constrained by low production and productivity embedded in the sector, high risks and uncertainty as well as low returns and declining terms of trade. Increased productivity in the agricultural sector depends on the youth who comprise 17% of the economically active population in Zanzibar (The Integrated Labor Force Survey (ILFS), 2010). There is need to research on youth involvement in agriculture that could lead to reduction in the youth unemployment rate to less than 10% by 2020.

### **2.1.10 Public Private Partnership**

Participation of the private sector in agriculture is less than 5% due to inadequate capital investment, government policy on subsidy schemes and limited awareness. Therefore, there is need to enhance private sector involvement in agriculture to at least 20% by the year 2020. Priority research topics are in this connection the factors constraining the private sector from investing in agricultural sectors and the challenges and opportunities of foreign and local



investments in agro-processing and agro-based industries for potential agricultural products.

## **2.2 LIVESTOCK**

The Livestock sector plays a big role in rural development, poverty reduction and improving household wellbeing by providing employment and nutrition. The sector's development is constrained by various factors, including weak extension and research services, low genetic potential of local breeds (Largely of low quality), inadequate access to credit and grant facilities, poor marketing system and value addition, outbreak of livestock diseases and weak information management system. The sector's GDP contribution is estimated at about 4.5%. The development and advancement of the livestock sector requires the implementation of appropriate policies and strategies in order to achieve the desired objectives of reducing rural poverty and improving food security.

The following are the ranked researchable areas:

- Feeds and feeding systems
- Crops-Livestock interaction
- Animal health and disease management
- Animal breeding and production
- Value chain and marketing of livestock products
- Technology transfer
- Livestock by-products and renewable energy
- Socio-economy of livestock production
- Drug residues in foods of animal origin
- Organic farming in livestock production

### **2.2.1 Feeds and Feeding Systems**

Feeds account for almost 70 % of production costs in livestock projects. Research in feeds and feeding systems is thus very important in reducing cost of feeds and knowing exactly what to feed. The aim is to enhance the availability and accessibility of quality animal feeds for livestock through production of quality feeds at affordable prices. Research in this area may include the quality of feeds; conducting analysis of different types of feeds; determining

growth performance of animals fed a variety of feed rations; determining comparative costs of feeds; determining seasonal variability of feeds; developing simple diets from feed resources, pasture quality, feeding and analysis as well as assessing the availability of alternative methods of feeding systems to minimize feed wastage and maximize production.

### **2.2.2 Crops –Livestock Interaction**

Zanzibar has a total area of 2,645 km<sup>2</sup> with human settlement of 1.3 million and a population growth rate of 2.8% per annum (Census 2012). Increased urbanization causes a decrease of grazing land for livestock. The research will be looking at how to utilize crop residues and by-products of agro-industries as an alternative source of animal feeds. The target is to produce 50% of semi-processed animal feeds from crop residues by 2020.

### **2.2.3 Animal Health and Disease Management**

Animal diseases cause great losses of livestock in Zanzibar. The common reported diseases are brucellosis, tuberculosis (TB), rabies, anthrax and salmonella. Tick-borne diseases alone affect 50% of the cattle population while only 10% of the farmers vaccinate their chicken against Newcastle disease that causes massive chicken mortality. The aim is to reduce zoonotic, trans-boundary and tick-borne diseases to 30% and to vaccinate 50% of the chicken population by 2020. Research in animal health and in disease management is very important because of the extra cost incurred by farmers in treatment. Many diseases are infectious while others are zoonotic and must be handled with extra care. In disease management we are looking at how we can contain the diseases. Research in this area should look at issues such as disease surveillance (in both ruminants and non-ruminants); entomology – effects of ticks and flies and acaricides; parasitology – effects of helminthes; prevention and control – trans-boundary diseases; effects of protozoa on livestock and zoonotic diseases (e.g. TB in bovine and zoonotic worm).

### **2.2.4 Animal Breeding and Production**

The daily milk yield of indigenous Zebu cattle averages 2.1 litres with lactation periods of about 100 to 150 days. On the other hand, lactation length for crossbred cows ranges between 280 and 300 days with an average of 8.8 litres of milk per cow per day. In addition, milk production from local goats is extremely low, while a dairy goat can produce up to 3 litres of milk a day. Twinning rates among local goats are low at about 30 percent, compared to dairy goats with about 80–90 percent. Therefore, through cross breeding and improved husbandry, milk production can be increased from 8.8 to 15 litres a day for a cow and to 1.5 litres per day for improved dairy goats while simultaneously raising the twinning rate of the local goat to about 70 percent by 2020. An illustrative example of a research topic in this connection is how to boost the genetic makeup of local breeds of livestock for the purpose of increasing production and productivity without undermining local germplasm.

### **2.2.5 Value Chain and Marketing of Livestock Products**

Milk production in Zanzibar is estimated to be 36,544 tons per year, none of it being processed. Again about 14,800 cattle, 3,000 goats and a million chickens are slaughtered in Zanzibar every year. The target is to increase production of milk by 30%, 50% of which would be processed. Intended research topics in this area include ensuring quality livestock products.

### **2.2.6 Technology Transfer**

Technology has enabled mankind to live long and prosperous lives. Every aspect of life has been affected by technology. Transfer of technology is very important in livestock because it helps livestock farmers to increase production of milk and meat thus boosting their income. The aim, therefore, is to adopt new technologies for livestock keeping and to transfer them to livestock keepers. Priority research topics in this area include farmers' adoption of different types of technology, gender sensitivity on technology transfer and how society benefits from particular technologies.

### **2.2.7 Livestock By-Products and Renewable Energy**

Farm by-products especially cattle manure can be used to increase soil fertility and produce bio-gas as a renewable source of energy. In Zanzibar, the development of bio-gas technology is still at an infant stage. So far, there are 21 functional bio-gas plants installed. Currently the Ministry is assisting livestock farmers build their own storage tanks for biogas production. Inadequate knowledge and the high cost of biogas installation are among the limiting factors in technology adoption by livestock farmers. Research needs to be done to understand the economic benefits of these biogases and what cheaper materials are available for the construction of the tanks. The overall aim in this area is to reduce the cost of biogas installation and to establish an animal by-product data base by 2020.

### **2.2.8 Socio-economy of Livestock Production**

Livestock have a significant role in our lives and economy. They are kept to fulfil many functions including as a source of food, wealth, power, means of transport, security and for social events. The market segments in Zanzibar for livestock products include local and tourism markets. However, market access for livestock producers is generally hindered by low quantity and quality, poor storage, poor handling, inadequate processing, low quality packaging, lack of certification and poor general hygiene and sanitation. The sector has engaged more than 36,000 households in livestock production. The aim is to increase the contribution to GDP of locally produced livestock products. Research priorities in this area may include the impact of livestock production on household incomes, the impact of livestock production on GDP, the livestock value chain and its impact on society, determination of the market prices of livestock products and determination of the production of livestock products.

### **2.2.9 Drug Residues in Foods of Animal Origin**

Food-borne diseases and drug residues pose a threat to food safety and public health. Inadequate knowledge and information of the diseases among the public, illegal importation of animals, high cost of vaccines, inadequate health support services, poor infrastructure development and weak linkages between livestock keepers and

veterinary health services are reasons for declining food safety in primary production. The aim is to reduce food-borne diseases and drug residues by improving farm management practices. Research priorities would include the effect of drug residues on animal products, the effects of consuming drug residue on humans and the effects of poisonous plants on animal production.

#### **2.2.10 Organic Farming in Livestock Production**

Organic farming is a practice that discourages the use of industrial chemicals such as drugs, fertilizers and pesticides that can produce harmful residual effects in livestock and their products. The organic livestock farming in Zanzibar is constrained by lack of awareness among farmers and the general public as well as inadequate expertise for development of technology. The aim is to raise production of organic products in Zanzibar and increase livestock household keepers. Studies on organic farming in livestock production are needed in order to determine how farm animals perform with varying degrees of feeds. Other priority research areas include a cost benefit analysis of the business, profitability of organic farming, disease susceptibility of the animals and product quality compared to conventional farming.

### **2.3 FISHERY**

Fishing is an important economic activity among the coastal people of Zanzibar. The fisheries sector was contributing 7.2% to the GDP by 2012. The sector employs about 25% of the population either as fisherfolk or as providers of supportive services. According to 2012 statistics fish catch totals 29,411 tons caught by 34,571 fisherfolk.

Mariculture is an emerging economic activity led by seaweed farming, the third most important foreign currency earner after tourism and clove farming. There were about 140 community groups engaged in mariculture in 2013.

The following are researchable areas:

- Mariculture (seaweed and fish farming);
- Small pelagic fish;

- Value addition, marketing and post-harvest management;
- Marine protected areas;
- Technological transfer in the fishery value chain;
- Sustainable management of coral reefs;
- Marine endangered species and Biodiversity Conservation;
- Harvesting and utilization of invertebrates;
- Fish stock assessment (territorial waters and deep sea);
- Spawning aggregation of marine fish.

### **2.3.1 Mariculture (Seaweed and Fish Farming)**

#### **Fish farming**

Fish farming is an important emerging mariculture activity in Zanzibar. Most of aquaculture is concentrated in mangrove areas, with seeds being collected from the wild. The aim is to develop alternative fish farming techniques such as cage culture to increase production. Priority research topics may include development of seed and feed production for the fish culturing industry, species diversity and innovation.

#### **Seaweed farming**

Seaweed farming started in 1989. This subsector employs 23,000 farmers in Zanzibar and its production reached 15,087 tons in 2012. Recently problems have emerged in the areas where seaweed farming originally started, including diseases such as die-off and epiphytes growing on the seaweed. Others problems are skin itching among the seaweed farmers, low prices offered by buyers and conflicts between fishing/seaweed communities and other sectors. It is targeted to increase production from 15,087 tons in 2012 to 20,000 tons by 2020 through improved farm management practices and alternative farming methods. Examples of research topics in this area would be die-off of sea weed, impact of climate change on seaweed growth, epiphyte infestations, new seeds as well as marketing and innovation.

### **2.3.2 Small Pelagic Fish**

Small pelagic fish (sardines, Indian mackerel, and anchovies) are

an important food source for the community and local market. The species are caught in nets and the standing stock is around 2000 tons per year. Demand from outside markets has now induced more fishing which may lead overfishing and ultimately to a reduction of the fish stock. Research on small pelagic fish should look at the areas of seasonality, abundance, spawning behaviour and migration, amongst others.

### **2.3.3 Value Addition, Marketing and Post Harvest Management**

In fisheries and aquaculture there are several factors that explain the need for value addition and marketing of products. In order to satisfy the increasing demand for value added products, producers and exporters have to focus on consumers' preferences in relation to their income, tastes, specific needs, and cultural and religious constraints or combinations of these. Currently fisheries and aquaculture products are sold unprocessed or processed to low standards. Products such as seaweed, pearls and shell jewelry are among those which are poorly processed ones. In addition fish and other products are processed through traditional methods of sun drying, smoking and salting. The aim is to develop processing, packaging, incubation and marketing techniques for marine products.

The value addition and marketing is still on a small scale and of low quality partly due to limited investments in technology and equipment. On the other hand production, sale and distribution of value added products often require considerable economic resources for marketing and promotion. For better value addition, marketing and post-harvest management of fishing and aquaculture products, research in this area should focus on the types of products to be produced, methods of production and the cost of production based on acceptable standards.

### **2.3.4 Marine Protected Areas (MPAs)**

MPAs are important in increasing fishing and tourism activities. There are three MPAs in Zanzibar and two more are emerging. The MPAs have a lot of income generating activities to contribute to better

management of conservation areas. Co-management is practiced and general management plans are present. However, there are conflicting interests among fisher folk in some villages within the MPAs. The existing problems in MPAs can be reduced by regular monitoring. Priority in research on MPAs should be directed towards sustainable management of MPAs and monitoring techniques.

### **2.3.5 Technological Transfer in the Fishery Value Chain**

Very few studies have been done on the value chain. The seaweed value chain ends at export and it is estimated that a farmer gets 0.26% of world prices. In the case of capture fishery, fishing gear has remained traditional for many years and hence there is a need to research on gear technology. It is expected that value chain information and improved gear will be in place by 2020 for important marine products. The aquaculture and fisheries sectors are mature enough to involve large numbers of coastal people (there were 23,000 seaweed farmers and 35,000 fishermen in 2012), although technology transfer has been on a small scale with very little processing. There has been a lot of research on seaweed farming but nothing on potential farming techniques, drying technology and value addition of seaweed. Also only a few studies have been done on the *Eucheuma* species but not on finding new seaweeds that can be used for human consumption, medicinal purposes or even for chicken and fish feeds.

### **2.3.6 Sustainable Management of Coral Reefs**

Coral reefs are habitats and nursery grounds for fish. Coral reef habitats support many organisms as feeding, spawning and nursery grounds for both shellfish and fin fish species. Artisanal fisher folk depend on coral reefs for their fishing by up to 45%. The aim is to conduct studies on coral resilience and the impacts of climate change and other stressors by 2020. Sustainable use of coral reef resources is the concept that should be used in order to balance between resource production and human consumption, such that harvesting will not reduce future production and options for resource use. In sustainable management it is necessary to switch focus from short- to long-term use and profits. Sustainable management also



calls for an ecosystem management concept where resource use is in harmony with the many ecological processes and diversity of the relevant ecosystem while managing for multiple present and future needs of Zanzibar's coastal people.

Research on coral reefs should focus on reef ecosystem health, coral biodiversity assessment, corallimorphoria overgrowth, crown-of-thorns (coral-eating starfish) outbreaks, coral diseases and bleaching, the population of sea urchins and coral die offs. For instance, one of the simplest ways to manage a fishery is to reduce effort whenever the total catch for a specific area declines (i.e. beyond the maximum sustainable yield), but there is also need to conduct studies to justify the amount of effort and type of effort which needs to be reduced.

### **2.3.7 Biodiversity, Conservation and Endangered Species**

There are several endangered terrestrial and marine species in Zanzibar such as dugongs, whales, dolphins, sharks, rays, turtles, coelacanth, red colobus monkey, tree hyrax, bush baby, ailer duiker and owl. These are important in biodiversity conservation and eco-tourism activities. By 2020 information on the status of these animals should be in place for their better management. Their migratory patterns and movements need to be studied to gather knowledge that will assist us in sustainable conservation measures and promotion of environmentally friendly marine tourism.

### **2.3.8 Harvesting and Utilization of Invertebrates**

Coral reef products such as shells, sea cucumbers, finfish and valuable invertebrates such as conch, giant clams, cockle shells, mussels, tiger cowries, other cowries, lobsters, and ornaments are part of the global trade environment. The globalization of these products has created a demand beyond what is locally sustainable and hence collection of these products calls for sustainable managements of the coral reefs. The trade in coral and other related species is presently included under CITES (Convention on International Trade in Endangered Species) and requires permits although it faces a lot of challenges which need to be addressed through further research.

In addition, there are other coral reef products that are equally vulnerable and the extent of their influence on coral reefs is poorly understood. Their exploitation is also not well regulated. Trade in these products should be undertaken with caution and only after some estimates of populations of these species in their natural environment and evidence that the methods used to collect them are not destructive to the habitat. Greater restrictions on trade will improve the chances of the species being monitored and protected although the restrictions should be based on studies which must be conducted in collaboration with higher learning institutions or research institutions. Research topics may include in-depth studies of invertebrate populations and abundance of invertebrate diversity.

### **2.3.9 Fish Stock Assessment (Territorial Waters and Deep Sea)**

Fisher folk have increased in number from 18,000 in 2007 to 34,000 in 2012. The estimated stock stood at 150,000 mt within the shelf area. Furthermore, there is no information at all on deep sea fish stocks in Tanzania. There is thus a need to establish a data management system as well as conduct stock assessments and socio-economic studies on territorial and deep sea waters for sustainable management of marine resources.

### **2.3.10 Spawning Aggregation of Marine Fish**

There have been very few studies on fish spawning aggregation and seasonality of fish breeding in Zanzibar. Some biological studies of fish have been conducted, but involving no more than 10 species. Priority areas for research are therefore spawning periodicity, abundance, sites and seasonality and migration of important commercial fish species.

## **2.4 FOOD SECURITY AND NUTRITION**

The fight against poverty and food insecurity is a key development agenda of the Revolutionary Government of Zanzibar (RGoZ). The RGoZ has been placing greater emphasis on addressing food security and nutrition as a means of reducing food poverty, increasing opportunities for the poor to pursue sustainable livelihoods and consequently improving their daily living conditions.

The Government's commitment to this end is reflected in both sectoral and overarching policy frameworks including the Zanzibar Development Vision 2020 (Vision 2020), MKUZA and the Food Security and Nutrition Policy of 2008.

Food insecurity in Zanzibar affects 26% of the population, who face a temporary decline in household access to adequate food. However, 4% of the population is experiencing chronic food insecurity. Transitory food insecurity arises from instability of food production, related in turn, to household income being influenced by (inter alia) seasonal factors.

Below is a prioritized list of researchable areas:

- Food toxicology
- Food quality and standards
- Food productivity and availability
- Value addition
- Food reserve
- Food and Nutrition
- Income vulnerability
- Indicators for vulnerability to food insecurity
- Informal micro-credit schemes

#### **2.4.1 Food Toxicology**

The recent increased prevalence of non-communicable diseases is apparently associated with food consumption. Also, most commodities are now processed and the addition of numerous non-nutrient substances calls for further investigation. Unfortunately, there is no fast detection technology that will help in detecting harmful substances in those products and thus help control their distribution. Research should therefore focus on how to establish and evaluate the safety of different food products along the food chain and how to determine proper methods to detect toxicity. It is expected that by 2020 data and information on the status of food toxicology and fast detection equipment will be available.

#### **2.4.2 Food Quality and Standards**

The Zanzibar Bureau of Standards (ZBS) was established recently,

but currently there is neither a system/mechanism for standards development and adaptation nor a prioritization of standards demand for SMEs. By 2020 it is intended that the standard demands and mechanisms for standard adaptations will be developed.

Priority research areas in this connection are:

- The effects of the application of inorganic pesticides on food crops safety;
- The causes and impact of trade liberalization of pesticides;
- The determination of factors for selection of farmers pesticides and their effectiveness on pest control, production costs and profitability;
- Linkages between soil fertility management practices, nutritional value of crops grown and nutritional levels of the population.

#### **2.4.3 Food Productivity and Availability**

Food availability in Zanzibar is largely determined by food imports which account for 59% of annual food requirements. Traditional subsistence farming is still widely practiced resulting in low per capita production and crop yield per unit area remains far below the potential levels. The dependency on food imports and the prevailing higher food prices pose a threat to poor households and subsequently increase vulnerability to food and nutrition insecurity. Research to promote agricultural production and productivity is therefore critical; the aim is to reduce dependency on food imports to at least 30% by 2020.

#### **2.4.4 Value Addition**

Zanzibar processing technologies are not sufficient to maintain nutritional contents. Additionally, proper packaging of materials are not easily accessible, thus making competition in the market rather difficult. The aim is to improve the nutritional value and packaging of food products thereby improving the livelihoods of Zanzibaris. Illustrative priority research topics in this area include innovational packaging and processing and preservation techniques.

#### **2.4.5 Food Reserves**

The RGZ is working towards the establishment of a food reserve to facilitate a humanitarian response to food emergencies and stabilize the rice market. However, there are no findings to support an appropriate reserve system. By 2020, it is expected that an effective food reserve system will have been established. Priority research areas in this connection are the effect of the rice trade liberalization on food security and poverty in Zanzibar and the effectiveness of the Zanzibar rice import duty policy in food consumption.

#### **2.4.6 Food and Nutrition**

Key nutrition indicators show that in Zanzibar poor nutrition is an important dimension in household food insecurity as reflected in the high prevalence of micronutrient deficiencies and protein energy malnutrition (PEM), with women and children being the most vulnerable groups. Prevalence of child malnutrition is critical in Zanzibar with 30.2% of under-fives being stunted, 12% wasted and 20% underweight. Prevalence of nutritional anemia is equally high with 68.5% for under-fives and 58.7% for women in the age of 15-49. Priority research topics would include the determination of the causes of food insecurity and malnutrition in Zanzibar (for instance in Micheweni district), accessibility of food relative to its nutrition status and the identification of vulnerable groups in relation to agriculture-for-nutrition interventions in Zanzibar.

#### **2.4.7 Income Vulnerability**

44.4% of Zanzibaris are living below basic needs poverty and 13.04% below the food poverty line. The overall level of dependency on food purchases ranges between 40 and 65% of annual household food consumption. The proportion of household income spent on food is also high - 60% and 51% of total household income for low and higher income quintiles respectively. The aim is to promote stable and diversified sources of income for poor households by 2020.

Priority research areas would be:

- Issues related to clove growing. For example, an assessment of the role of cloves in the pattern of

transient income poverty,

- The impact of current rice input subsidies on the income and welfare of the rice farming community;
- Risk and vulnerability assessments (to establish frequency and characteristics of food security shocks, number of people exposed to these risks, people's susceptibility and ability to manage risks without external assistance);
- Analysis of the effectiveness of coping capacities (livelihood strategies) to manage adverse effects of risks;
- Resilience of the most vulnerable groups in order to guide the prevention and mitigation efforts well in advance of specific shocks and
- The establishment of vulnerability and food insecurity mapping systems.

#### **2.4.8 Indicators of Vulnerability to Food Insecurity**

Twent-six per cent of the Zanzibar population is food insecure with 4% living in chronic food insecurity. However, government initiatives in addressing the underlying causes of food insecurity are undermined by lack of current information on the status of vulnerability to food insecurity in Zanzibar for different livelihood categories and population groups. The aim in this area is to establish an effective monitoring system for food security that will guide timely responses and actions. Priority research areas are in this connection:

- Determinants of risk management capacity of food-vulnerable and food-secure groups;
- Risk management strategies/coping mechanisms in food insecurity in Zanzibar (ex-ante prevention and mitigation and ex post coping strategies) as well as
- The causal structure of vulnerability, sources of risk and determinants of coping capacity for transitory and chronic food insecurity in Zanzibar.

### **2.5 CLIMATE CHANGE, ENVIRONMENT AND CONSERVATION**

Zanzibar's economy is very dependent on the climate, which is changing, with recent decades experiencing rising temperatures, increased rainfall variability, higher wind speeds and high-tide

levels, and an increase in extreme events. The latter have led to droughts and floods which have had major economic cost in terms of GDP. It is clear that Zanzibar is not adequately adapted to the current climate, and there is an urgent need – as well as a large economic benefit – from addressing this existing adaptation deficit.

The following are the prioritized researchable areas:

- Climate change adaptation and mitigation
- Waste management
- Sustainable land management
- Sustainable forest management
- Environmental degradation
- Water quality and quantity
- Disaster preparedness and early warning
- Conservation of biodiversity
- Coastal resource management

### **2.5.1 Climate Change Adaptation and Mitigation**

Adaptation can reduce the impact of climate change and there is emerging international finance for adaptation. A broad set of potential adaptation options has been identified. These have been prioritized in a short-term priority plan, built around an adaptation pathway that maximizes economic opportunities whilst building information to help decisions in the future, especially in the face of uncertainty. However, operationalizing, adapting and delivering such a plan will require significant funds, as well as institutional capacity. Priority research areas under this topic include:

- Factors involved in sea level rise and its impact on the size of Zanzibar's Islands,
- Investigation of the magnitude of salt intrusion on farms by using Zanzibar Environmental Information System (ZEIMS);
- Assessment of the efficacy of indigenous adaptation and coping strategies to environmental changes;
- The loss of fresh water involving frequent salinity tests of fresh water in Zanzibar,
- The impact of climate change on groundwater resources;

- Surface sea temperature changes and the depletion of coral reefs;
- The importance and role of coastal vegetation/ forests including mangrove ecosystems as a means of mitigating effects of climate change;
- Determining CO<sub>2</sub> emissions according to sectors in order to have a clear understanding of their proportionate impact;
- Proper mechanisms for controlling salt water intrusion on farm lands.

### **2.5.2 Waste Management**

Currently there is little information on the daily amount of waste (solid, liquid and gaseous) generated in Zanzibar. It is estimated that the Zanzibar Municipal Council collects less than 50% of generated solid waste, the remaining waste is uncollected. Over 80 of the solid waste generated in Zanzibar Municipality is organic in origin. All types of waste (hospital, domestic, institutional, industrial etc) are mixed and handled together in all the stages and carelessly dumped. Also, there is no centralized sewer system in Zanzibar Municipality, with only Stone Town and some areas in Ng'ambo being served by a sewer system. Additionally, the disposal of used items such as fridges and freezers, cookers, air conditioners and other electrical appliances has been a threat to the natural environment in Zanzibar. There is also no effective plan for E-waste, although there is a lot of importation of second hand materials such as TVs, computers and the like. And thus there is an escalation of the e-waste in the streets. To overcome this problem, it is aimed that by 2020 70% of the solid waste would be collected and treated using the 3R approach (reduce, reuse and recycle).

Priority research areas under this topic include:

- Imported used cars and their potential impact on air pollution,
- Sources and sinks of Green House Gases (GHGs),
- Feasibility studies on the usage of waste as raw materials for new products,
- Management of electronic and electrical waste,



- Assessment of the usability of polluter pay principle in Zanzibar,
- Assessment of the extent of air pollution in Zanzibar and
- How the 3R approach can be applied in Zanzibar to promote solid waste management practices.
- How to restrict the importation of used e-materials

### **2.5.3 Sustainable Land Management**

Land use conflict is an emerging issue among land users due to an increase in socioeconomic activities, tourism, agriculture, livestock keeping, construction and other activities. Inadequate land use plans are a major contributing factor to conflict escalation. It is the target to reduce land use conflict by 2020 by having an appropriate integrated land use plan for Zanzibar. Priority research areas under this topic include:

- The encroachment of agricultural land for human settlement;
- Management of non-renewable resources;
- Sustainable management of degraded land;
- Strategies for Sustainable Land Management and Poverty Reduction;
- Multifunctional regional policies designed to accommodate the diversified land use demands of the urban population and those of the surrounding rural areas as well as spatial development of urban areas in relation to the surrounding rural areas.

### **2.5.4 Sustainable Forest Management**

Escalating demand for wood fuel, farming and settlement expansion are the three most important drivers of deforestation. The distribution of the main energy sources used in Zanzibar is: biomass fuels 74%, petroleum products 21% and electricity 5% (The Economic Climate Change Study – 2012). It is estimated that peri-urban and rural population cooking energy needs on biomass reached 40% and 96% respectively. This situation pushes the forest degradation and deforestation (coral rag forests) at a rate of -0.9 %/year and agricultural and settlement areas +2.9 %/year. The domestic wood supply is 485,532 m<sup>3</sup>/annum, while domestic wood demand is at 1,340,609 m<sup>3</sup>/annum. Thus the deficit is estimated at -0.85 million

m3. In this regard the per capita consumption of wood energy is estimated to have reached 1.3 m3/cap. The target of research in this area would be to reduce wood consumption per capita from 1.3 m3 to 0.59 m3 by 2020.

Priority research areas under this topic would include:

- A study on medicinal plants and endangered organisms;
- Zanzibar-wide biodiversity inventory;
- Impacts of forest fires on biodiversity;
- Economic valuation of forest protected areas;
- Assessment and mapping of potential non-renewable extraction sites;
- The impact of invasive species on eco-tourism;
- The potential of forests to pay for Ecosystem Services; and
- The development of a payment mechanism through carbon credits.

### **2.5.5 Environmental Degradation**

In Zanzibar environmental degradation is mainly influenced by over utilization of non-renewable natural resources for socio-economic activities. For example, the size of undeveloped barrow pits ranges between 2,500 m<sup>2</sup> to 6 km<sup>2</sup>. The adverse effects and environmental impact of land degradation caused by unsustainable excavation of non-renewable natural resources in Zanzibar have evidently become irreversible. The aim is to reduce land degradation through sustainable use of non-renewable natural resources. Priority research areas under this topic include the use of alternative construction materials and the development of proper skills to improve the degraded environment.

### **2.5.6 Water Quality and Quantity (Hydrosphere)**

It has been discovered that the ground water table is contaminated by salt intrusion, obvious from the difficulty of striking water in deep wells free from salt contamination. Shortage of fresh water is also attributed to the depletion of underground water due to uncontrolled human activities such as deforestation of the catchment areas, poor farming methods, increased tourism and lack of proper sewage

systems in some places. Degradation of surface and ground water sources is also caused by climate change, resulting in reduction of the quantity and quality of water supply. The main target is to control the quality and quantity of water by 2020. Priority research areas under this topic include technologies of rainwater harvesting and indigenous knowledge of water resource conservation.

### **2.5.7 Disaster Preparedness and Early Warning**

Disaster incidents are increasing in frequency and intensity due to changing weather patterns. Recently, Zanzibar experienced flooding in 2005 and 2011 which affected 1,000 homes, displaced 10,000 people and damaged infrastructure in both Unguja and Pemba. Only U\$50,000 was available to deal with the 2005 disaster, indicating inadequate preparation. Disease outbreaks such as that of cholera, drought, tsunami and storms are recorded occasionally, affecting agriculture, livestock and people's livelihoods. The target is to reduce the effects of disasters on people's livelihoods by 2020. An illustrative research area under this topic is the mapping of disaster areas.

### **2.5.8 Conservation of Biodiversity**

The existence of human beings depends on the nourishment of biodiversity. It is believed that a large proportion of Zanzibar's common plant and animal species face a dramatic decline this century due to climate change. The main threats to biodiversity include habitat loss due to encroachment, fragmentation, resource overexploitation (of both flora and fauna), invasive species and disturbances. Immediate measures need to be taken to conserve the rare, endemic, threatened, endangered and other species occurring inside Zanzibar. The target is to have a country-wide data base on biodiversity value distribution and abundance established by 2020.

Priority research areas under this topic include:

- Traditional knowledge and its role in the preservation of the environment;
- An assessment of environmentally sensitive areas

### **2.5.9 Coastal Resource Management**

The coastal resources of Zanzibar constitute a complex interconnection of a variety of ecosystems (both terrestrial and marine). There is an over utilization of coastal resources, due to multiple uses, such as hotel and settlement construction, salt farming, and others that has led to severe damage to of these resources. The rate and magnitude of coastal resource depletion and accretion are not well understood. The main target in this area is to adopt measures that will insure the sustainable usage of the coastal resources by 2020. Priority research areas under this topic include tourism and environmental impacts, integrating socio-economic activities into safe tourism (e.g., spice gardens, eco-tourism, jungle marathons, and caves) and the potential impacts of unplanned and uncoordinated tourism.

### **2.6 LAND MANAGEMENT AND HUMAN SETTLEMENT**

Land is a basic resource for human survival and development. Therefore, access to adequate and affordable habitats is essential for the people's social and economic well-being and is a fundamental part of the national plan. Zanzibar has a very high population density of 500 per sq.km, in a land area of 1,666 sq km for Unguja and 988 sq. km for Pemba. This ratio is alarming when it comes to actual development planning. After the Revolution, a number of land reforms were instituted aimed at changing the ownership of land rights and the system of land administration, the main concern being land scarcity and an inadequate land management system. Poor land registration implies that land tenure in the two islands is a challenge. The informal land distribution has involved mainly the urban poor, which makes its regularization one of the biggest administrative challenges facing the responsible institutions. Therefore, there is a need to undertake a study in order to improve land management systems and human settlements development and this will help in achieving the targets indicated in Vision 2020 and MKUZA II. Priority research areas for the Land and Human Settlements area are:

- Building materials and standards
- Land registration

- Land valuation and property management
- Land use planning
- Housing development
- Land information systems

### **2.6.1 Building Materials and Standards**

Zanzibar lacks building material, regulations standards and modern laboratory equipment for checking the quality and strength of materials. This has increased imported building materials from abroad. Approximately 80% of construction materials are imported. As a consequence, the majority of Zanzibaris fail to build standard houses due to the high cost of construction materials. This leads to expansion in sub-standard and unfinished houses in many areas. The estimated cost for building one square meter for a new house is about Tshs 300,000 to 400,000, charges which most Zanzibaris cannot afford. Therefore, there is a need of undertaking research on how to reduce the importation of building materials and establishing a local building materials industry, standards laboratory and capacity building for workers, including materials processing, storage and quality management by the year 2020.

### **2.6.2 Land Registration**

Land registration is a very important factor in land administration and in securing land rights. It guarantees the right of occupancy for individuals, legalizes transfers of land and can be used to acquire loans. However, most Zanzibaris are not aware of the land registration process and its benefits. Therefore there is a need to do research on how land registration can be done and raise awareness among Zanzibaris.

### **2.6.3 Land Valuation and Property Management**

As markets spawned and farmers, land owners, business people and tenants become increasingly aware of the value of land, it is important to have a solid formalization process. Land assessment is important for knowing the monetary value of property for different uses. The rapid economic and population growth has resulted in strong competition for available land resources. But until now there

is no machinery that regulates the valuation activity, to determine if properties should be assessed for compensation by using market value or replacement cost. Therefore, there is a need to undertake research on how best to do land valuation and management in Zanzibar.

#### **2.6.4 Land Use Planning**

The National Land Use Plan was prepared in 1995, the only land use policy covering both Unguja and Pemba. The main implementing agencies of the land use plan, the local authorities, are facing several problems including limited financial and skilled human resources, rapid urbanization and socio-economic development, an inappropriate legal set-up and the lack of resources for monitoring land use development. For these reasons, all land use planning issues are implemented at the central level. Therefore research needs to address the above issues in order to achieve proper land use management by 2020.

#### **2.6.5 Housing Development**

Inadequacy of decent housing is one of the critical problems in Zanzibar, leading to extensive illegal settlements. The draft National Land Policy indicates that over 70 percent of Zanzibar's population lives in unplanned settlements. The gap between supply and demand in housing has been widening due to population increase. But there is no thorough study on the annual housing demand, and the condition of existing housing. There is also a lack of appropriate policy intervention in housing development as well as housing finance. While the latter is due to limited formal mortgage housing facilities, government budget allocation to housing has also been generally low. The aim of research in this area is to reduce the shortage of housing while at the same time improving the quality of housing.

#### **2.6.6 Land Information Systems**

The traditional techniques used for capturing land information (surveying and mapping methods) are not sufficient to cope with the demand for managing and coordinating land matters. Therefore,

actual qualitative and quantitative use of land information is also limited due to low awareness of its importance among planners and decision makers, and a lack of institutional and policy arrangements. Information on land accessibility and application is not coordinated for spatial development projects, so it is important for Zanzibar to have a fully operational land information system in order to facilitate the planned development of the islands. The target is for Zanzibar to have a sustainable land management information system by 2020 in order to address all land administration issues (land surveying, land use, land valuation and land registration).

## **2.7 ENERGY**

Sustainable, affordable and efficient energy supply is a major strategic input for the successful implementation of MKUZA II and the achievement of the Millennium Development Goals (MDGs). MKUZA II identified energy as one of the strategic sectors for the transformation of rural health, education, water, agriculture, and the environment.

More than 80% of total energy use on the islands is in the domestic sector, while approximately 20% is used jointly by the industrial and commercial sectors. The Economic Climate Change Study 2012 indicates that 74% of the total energy is from biomass (wood, charcoal and residues), 21% from oil products (diesel, petrol and LPG, etc.) and 5 % from electricity. Electricity, oil and part of the biomass are all imported.

Therefore, priority research areas for the energy sector are;

- Renewable energy sources and technologies
- Supply and efficient use of biomass for domestic applications
- Off- grid electricity supply
- Energy efficiency
- Oil and gas

### **2.7.1 Renewable Energy Sources and Technologies**

Zanzibar's electricity supply is fully dependent on the Tanzania Electric Supply Company Limited (TANESCO) through a submarine

cable. The connection rate is about 40% of the households and the target by 2020 is 61%. Studies by European Union consultants have indicated that by 2020 the demand may exceed the capacity of the supply cable to the Islands. The Government policy is to increase generation capacity, preferably from renewable sources. Technical studies are planned to accurately measure the wind power and potential for wind farms. Solar radiation is estimated at 5 KWh/m<sup>2</sup> which offers opportunities for on-grid and off-grid solutions. The aim is to establish the potential for various energy sources, particularly wind, solar and other feasible renewable energy technologies which have the highest potential for Zanzibar. This may be on-grid or stand-alone systems. The research areas include:

- Environmental and social impact of the operation wind turbines,
- Financing model(s) for commercial renewable energy generation towards sustainability
- The safety of solar equipment in mass usage in rural areas
- Financial frameworks for the poor to access off-grid solar equipments
- Local design of good robust solar home systems (SHS) for low income users
- The practical penetration ratio of renewable energy generation capacity to total supply versus time
- The viability of large scale solar farm versus wind farm electricity generation technologies
- Existing transmission infrastructure and load matching from proposed renewable energy generation farms and
- Marine based renewable energy technology.

### **2.7.2 Efficient Domestic Supply and Use of Biomass**

Wood is by far the most important source of cooking energy in Zanzibar. The HBS 2009/10 shows that 97% of the population use firewood or charcoal as their main fuel for cooking. In addition there are many large users such as hotels, camps and bakeries which utilize huge quantities of fuel wood for their daily operations. The Department of Forestry has commissioned a study on the impact of these large consumers on wastage of biomass; limited studies have been undertaken on the various large consumers



on the potential for increasing efficiency in firewood use or the opportunities to use alternative fuels. Electricity and LPG make only a small contribution. At the same time the population is increasing while overall land resources are further limited through changes in land use. Some studies show a large gap between demand and supply of firewood on the islands but these are based on numerous assumptions that need to be verified. The use of efficient cook stoves is limited, particularly in rural areas. The aim of this research area is to identify alternative sources of energy for domestic uses. The research would also provide information on opportunities for increased commercial wood production, efficient ways of using the resources available, and the impact of the large wood consumers on deforestation and rate of forest degradation.

### **2.7.3 Wood consumption**

Wood is used by 97% of the households as energy source for cooking. In addition there are many large users such as hotels, camps and bakeries which utilize huge quantities of fuel wood for their daily operations. Department of Forestry has commissioned a study to collect information on the impact of these large consumers on wastage of biomass, but limited studies have been undertaken on the different types of large consumers on the potential for increasing efficiencies of fire wood use or the opportunities to use alternative fuels. The aim is to examine the impact of the large wood consumers on deforestation and rate of forest degradation in order to chart for a sustainable way of utilizing this resource.

### **2.7.4 Off-Grid Electricity Supply**

The Zanzibar Electricity Corporation (ZECO) has an extensive electricity network and provides connection to about 40% of the households, according to the HBS 2009/10. There are over 100,000 connections, most of them in urban areas. About 60% of the population still uses traditional appliances for lighting and ZECO's plan is to facilitate about 7,000 new connections annually. This still leaves a large part of the population without electricity for some years to come. New technologies are becoming available in Tanzania, including portable solar lights, small home systems and

larger stand alone systems that can serve several households in remote areas. The aim is to research on various options other than grid network available for Zanzibar households.

### **2.7.5 Energy Efficiency**

According to ZECO reports, about 25% of energy is lost, half through technical faults and half through commercial misuse. More than 80% of the total energy in Zanzibar is consumed by the domestic sector. There are opportunities to reduce the energy bill by using more efficient equipment and better practices. The Government has started awareness campaigns to educate on the importance of using energy-saving equipment but more information is needed on best practices and cost-effective ways. The aim of this research area is to gather more reliable information on power losses, the potential to reduce power loss and ways of educating consumers to use energy efficient equipment.

### **2.7.6 Oil and Gas**

Earlier investigations of Zanzibar's geology indicate possible oil and gas reserves and investors have showed interest for further investigation and exploration. However, Zanzibar has limited capacity to undertake oil and gas research, draft and manage legal contracts with foreign investors as well as address socio-economic and environmental impacts of exploration and exploitation of oil and gas. The energy policy calls for the establishment of a legal and administrative capacity to ensure an enabling environment for further investigation and exploration. The aim is to build up local expertise to support the Government in decision-making by understanding the issues through research. Areas requiring attention for research include:

- Technical issues such as existing oil seeps in Zanzibar and their geological origin,
- Impact of oil seeps on environmental ecosystems,
- Research models of theoretical offshore oil slicks and impact of ocean currents on the Zanzibar marine ecosystem,

- The cost benefit of investing in onshore petroleum refineries in Zanzibar,
- Oil and gas for future power generation in Zanzibar, and
- A phased study on the geological mapping of Zanzibar (on-shore).

Resource development issues include research on human capacity development for future petroleum markets, comparative studies on the determination of effective and efficient utilization of oil and gas revenue in Zanzibar and downstream fossil fuel demand forecasting.

## **2.8 HEALTH**

The health sector embarked on a reform process since the early 1990s, which became fully fledged in the early 2000s. Two Strategic Plans have been formulated and implemented based on the 1999 Zanzibar Health Policy (the Health Sector Reform Strategic Plan I 2002/03-2006/7 and the Zanzibar Health Sector Strategic Plan II 2006/7-2010/11). The reforms are in line with the national strategy for poverty reduction, Vision 2020 and the MDGs 4, 5 and 6 which aim at ensuring the availability of equitable high quality health care services for all. Despite several interventions there are still challenges that need to be addressed in various areas.

Priority research areas for Health in ranking order are:

- Infant, child, maternal and reproductive health
- Health promotion
- Communicable diseases
- Non-communicable diseases
- Biomedical and traditional medicine
- Nutrition
- Environmental and occupational health and trans-border diseases
- ICT and telemedicine
- Nano-medicine

### **2.8.1 Infant, Child, Maternal and Reproductive Health**

Zanzibar is striving to reduce infant, child and maternal morbidity

and mortality and recently a reasonable 57.5% reduction in child mortality from 120 deaths in 1990 to 51 in 2010 has been observed. This approaches the set target of 40 deaths in 2015 which is in line with MDG 4. Interventions to improve reproductive and maternal health include the development and implementation of a National Strategic Plan (2008-2015) commonly recognized as the roadmap for the reduction of high maternal mortality. The latter was at the rate of 377/100,000 live births since 1978. Still there is a persisting high number of home deliveries (57% of all births), low uptake of family planning (below 15% of Women of Reproductive Age (WRA)), increasing rate of abortions, poor infrastructure for delivery and youth friendly services and low utilization of post delivery services. Other challenges include limited access to quality health services, a poor referral system, inadequate availability of commodities, equipment and supplies, and inadequate funding for maternal health services.

The aim is to propose evidence-based interventions that would reduce child mortality by 80% by 2020 and scale up reproductive health (including adolescent SRH) through improvement of infrastructure, capacity for maternal health services and improvement of quality including the availability, accessibility and utilization of maternal health services to eventually reduce the maternal mortality to 130/100,000 live births.

### **2.8.2 Health Promotion**

Non-communicable diseases are rapidly increasing in Zanzibar and reports show an estimated 4.5% and 18.1% of Zanzibaris with cardiovascular diseases and diabetes mellitus respectively (MoH, 2012). Various participatory approaches addressing hygiene and sanitation have been introduced for adoption, targeting community behavioral changes. The aim has been to increase awareness and knowledge on health matters as well as promoting community participation in health care delivery and utilization of health services. In addition, the strategy aims at reducing myths and misconceptions that hamper people accessing services when there is a need to do so.

The major anticipated outcome is positive behavioral change linked to people's knowledge. As a result, the approaches used have had minimal influence in behavior change because predominantly Information, Education and Communication techniques rather than Behavioral Change Communication intervention strategies have been used. Issues such as the community's socio-economic status, availability of hygiene and sanitation options/facilities, environmental/geographical status and community values were not considered during the planning and operational phases (HSSP III, 2013). To date, most of these approaches have yielded only community awareness, but have not brought sustainable behavior changes. Lack of knowledge of both infectious and non-communicable diseases significantly contributes to the worsening of a country's economy, directly or indirectly. There has been no study showing the best ways of providing health promotion interventions. For example, it has been reported that face-to-face health education delivery has not shown a significant improvement in immunization status (Kaufman et al, 2013), a situation that warrants further research to identify what will be the best approaches.

There is a need to have greater focus on planning health promotion interventions which could ultimately enhance behavioral change and engage the population in understanding various diseases and their preventive measures. Research can be undertaken to comprehensively identify:

- community health problems,
- public health needs, and
- priority areas for health promotion interventions for socio-economic development and effective modalities for applying the interventions.

### **2.8.3 Communicable Diseases**

HIV prevalence is approximately 1% in the general population and higher in some key population groups, such as homosexuals,, injection drug users and commercial sex workers. Malaria affects less than 1% but there are still pockets of outbreaks; Schistosomiasis is 5% in Unguja and 12% in Pemba; soil transmitted helminthiasis

is approximately 93% for any worm. Other diseases with high prevalence are TB, other respiratory tract infections, sexually transmitted infections other than HIV, and outbreak diseases such as cholera, typhoid, dysentery, measles and rabies. The aim is to reduce prevalence and incidence of diseases of public health importance by 40% by 2020 and eliminate communicable diseases that are at pre-elimination phase (malaria and schistosomiasis). The research topics that will be focused on among others are gender, sexual health and HIV, socio economic impact of HIV, concentration of HIV in Most-At-Risk (MARPs).

#### **2.8.4 Non-communicable Diseases**

Recently the chronic non-communicable diseases (NCDs) such as cardiovascular diseases, cancers, obesity, chronic obstructive pulmonary disease, diabetes, mental health and oral health, have become a major public health issue in developing countries to a degree where the World Health Organization (WHO) calls it an epidemic. Road traffic accidents have also been on the rise. According to a survey conducted in Zanzibar, NCDs were found to be significant health problems and are recognized as a major threat to the community (MoH 2012). Similarly, hospital records indicate that there is an increase of cardiovascular diseases and fractures from 3.6% to 8.9% and 1.6% to 4.5% in 2006 and 2009 respectively; while diabetes mellitus shows an increase from 17.6% to 18.1% in every 10,000 people for 2007 and 2008 (Health Management Information System). A cervical cancer clinic was established at Mnazi Mmoja Hospital (MMH) in 2004. Since then, 2,490 women have been screened, and out of those, 130 tested positive for Visual Inspection with Acetic Acid (VIA) and Visual Inspection with Lugol's Iodine (VILI), 614 were found to have mixed infection and 49 were referred for further management (Cancer Clinic 2004-2011). Interventions should also focus on Ear, Nose and Throat (ENT) diseases, thyroid diseases and arthritis. The aim is to reduce the prevalence of NCDs by 20% by 2020 through undertaking various kinds of research that will provide evidence-based policy formulation and planning of interventions for these diseases.

### **2.8.5 Biomedical and Traditional Medicine**

Studies indicate that the majority of Zanzibaris use both biomedical and traditional medicines. . Factors attributed to the increased uptake of traditional medicine are side effects of biomedical treatment, poor quality of biomedical services, lifelong drug usage, socio-cultural reasons and monetary reasons (Biesen & Dilger, 2012). However, the safety, quality and efficacy of traditional medicine are still unknown. The aim is to improve these by 2020 through undertaking research that will guide evidence-based strategies and subsequent appropriate interventions.

### **2.8.6 Nutrition**

Most Zanzibaris do not have nutritional education. The prevalence of under-nutrition in Zanzibar is about 26% and overall chronic food insecurity is 4% (HBS 2010). Malnutrition remains a threat to the health and survival of children and women despite various strategies and interventions. This affects the educational performance of school children, the cognitive and emotional and physical development of the population and future economic productivity. Research interventions to address the situation are needed so that more and better strategies are formed to tackle the malnutrition problem and build a healthy and productive community in Zanzibar.

### **2.8.7 Environmental and Occupational Health and Trans-Border Diseases**

The Port Health Services facility in Zanzibar was founded to cater for both environmental health and cross-border diseases. In its operations, it monitors and evaluates all foodstuffs, disinfectants, hazardous substances and medicines entering Zanzibar through official ports. Amongst the environmental health programs, management of solid and liquid waste, inspections on food safety and school health programs have been the main interventions. At a tertiary level, the health care waste management has been a great concern due to frequent breakdowns of incinerators. However, the school health program mainly targeted children and youth who suffer varying but significant degrees of ill health with compromised cognitive powers. The program also focuses on parasitic infections,

water related health problems, malnutrition, HIV/AIDS/STI, child obesity, teenage pregnancies, sexual harassment and drug abuse, among others.

Currently, medical waste management poses a great challenge. At tertiary level, there have been frequent breakdowns of incinerators. The facilities at MMH (which also offers services for private clinics and hospitals) are not environmentally friendly and are operated on the shores of the Indian Ocean. With many competing priorities, building a case for a higher budget allocation that would allow the procurement of a new incinerator is an additional challenge facing the health sector. There is a need to undertake research focusing on Occupational Health, Environmental Health and Port Health to understand the operations conducted, their impact on the public at large, the duplications said to exist, the existing capacity gaps and effective planning of related interventions.

#### **2.8.8 ICT and Telemedicine**

Telemedicine has rapidly evolved from a means of fulfilling outstanding care needs to a platform for delivering innovative and collaborative care by leveraging physicians from multiple sites. A big proportion of the health budget is used in transferring patients abroad. This is due to a shortage of specialized health care facilities and human resources to meet the needs of complicated health conditions. While there are significant potential benefits from telemedicine, evidence of its cost-effectiveness and sustainability is meager. This is because much of the telemedicine activity so far has been in the form of pilot projects in universities and hospitals with subsidized funding from government or other sources. There is a need for Zanzibar to undertake pilot projects in order to evaluate the potential and cost-benefit of telemedicine. The results of such pilot projects could be part of the development of a national health for all policy which incorporates telemedicine.

#### **2.8.9 Nano-medicine**

“Nano medicine is the preservation and improvement of human health using molecular tools and molecular knowledge of the human



body.” Nano-medicine has the potential to enable early detection and prevention to improve diagnosis, treatment and follow-up of diseases. Currently, there is no health facility that uses nano-medicine technique in Zanzibar. The aim of this research area is to understand issues related to this new medical application, its effectiveness and other implications and thus provide baseline data and information that will help in planning how it can be introduced in Zanzibar to improve public health by 2020.

## **2.9 WATER AND SANITATION**

Water and sanitation sectors in Zanzibar have been given paramount importance in both MKUZA and MDGs. According to MKUZA II, access to a clean, safe and sustainable water supply was 80% and 60% in urban and rural areas respectively. These figures are to be increased to 95% and 75% respectively by 2015. Current water supplies are well below requirements due to several factors, including water pollution, water loss, insufficient production, uneven distribution, climatic changes and inadequate customer databases. Others are under-exploitation of rainwater, insufficient water conservation, inadequate community awareness, rapid urbanization, high rates of wastage and water losses (up to 35%) in production, transmission, storage and distribution networks and uneconomic use of water resources. With regard to sanitation, the 2004/2005 HBS shows that 50% of rural and 96% of urban households are using improved toilets and ventilated improved pits (VIPs), in contrast to 1991, when 48.3% of the total population had no toilets and only 43% had pit latrines. The 1991 HBS showed that 74.5% of rural households had no toilets compared to 23.7% of the households in the urban areas.

Priority research areas for Water and Sanitation are:

- Water demand and supply
- Water resources management and security
- Solid and liquid waste management
- Climate change and water resources
- Waste water treatment, re-use and disposal
- Coastal basin and seawater intrusion
- Alternative water resources

### **2.9.1 Water Demand and Supply**

Unguja Island has an annual ground water potential of 307Mm<sup>3</sup> and 70Mm<sup>3</sup> of surface water, whereas Pemba Island has about 43Mm<sup>3</sup> of ground water and 717Mm<sup>3</sup> of surface water potential. The water sector faces several supply problems due to an imbalance between supply and demand, and the lack of current data on actual consumer demand. The aim of research in this area would be to assess the water demand of different user categories against supply capacity and supply gap. It is planned that by 2015 ground water abstractions as a percentage of acceptable yield would be 57.21Mm<sup>3</sup>/a and 10.85Mm<sup>3</sup>/a for Unguja and Pemba respectively.

### **2.9.2 Water Resources Management and Security**

Water resource management is the optimal planning, development and distribution of water resources available at a particular time. Management of water resources is very important for oceanic islands such as Zanzibar where water availability is limited and water sources endangered. Examples are the two main springs of Mwanyanya and Mtopepo which used to provide one-third of the water requirements for Zanzibar town. Due to encroachment of the catchment areas, these have been providing only 60% and 40% respectively for the past 13 years. Therefore, research on the identification, demarcation and mapping of known catchment areas of Unguja and Pemba is needed, as well as exploration of new catchment areas.

### **2.9.3 Solid and Liquid Waste Management**

It is estimated that the total waste generation for Zanzibar municipality is about 200 tonnes per day. Taking an average of 300,000 inhabitants in the area, it makes an average waste generation of 0.67 kg per day per inhabitant (Census data, 2002). Therefore, with the total population for Zanzibar approaching 1,300,000 inhabitants, it is estimated that over 870,000 tonnes per day of solid waste are generated. Out of this, only about 30% is collected by local authorities especially in the Zanzibar Municipal Council. The remaining 70% is disposed of in an unsustainable manner. The aim in this research area is to find out how to establish sustainable solid

and liquid waste management in both rural and urban areas through community involvement and empowerment. The target is to improve collection to at least 80% by 2015 and emphasize recycling, re-use and cleaner production approaches.

#### **2.9.4 Climate Change and Water Resources**

Zanzibar is now facing significant challenges in providing safe water for its citizens. Climate variability and change exacerbate these challenges. Changes in surface runoffs and groundwater flows in shallow aquifers are part of the hydrological processes that can be linked to climate variability and change, with implications for permanent and seasonal water bodies such as lakes and rivers. There is also a change of pattern in annual runoff in Zanzibar coastal basins, with some meteorological stations experiencing an extreme decrease in rainfall (Tanzania Meteorological Agency, 2005). For example, the two springs at Mwanyanya and Mtopepo were very productive but due to environmental and climatic change and variability, data collected from 1998 to 2011 showed the production has fallen by half. The research priority in this area is to find out how climate change and other environmental factors impact on water resources.

#### **2.9.5 Waste Water Treatment, Re-Use and Disposal**

Zanzibar like other developing countries is still struggling to improve water supply and sanitation including improvement of wastewater treatment technology and management for attaining the Millennium Development Goals (MDGs). About 70% of the population is served by traditional pit latrines that might directly or indirectly contaminate both surface and ground water. Only a small fraction of the population is served with septic tanks, which due to poor design and maintenance also appear to be a threat to water resources and public health. Discharge of untreated wastewater has caused several problems including elevating levels of total and fecal coliform in coastal waters (Mohammed, 2002). Sewage pollution has been cited as being principally responsible for increased cases of waterborne diseases on the islands (Mohammed, *ibid*). Thus research on appropriate robust waste treatment options that will address treatment, re-use and disposal is urgently needed.

### **2.9.6 Coastal Basin and Seawater Intrusion**

Zanzibar does not have big rivers and those available are mainly classified as perennials and non-perennial coastal and inland rivers. The water sources were initially located far from human settlements to prevent contamination, but currently almost all water sources are threatened by surrounding human settlements and other activities, which can cause both chemical and bacteriological contamination. On the other hand, Zanzibar ground water sources are characterized as coastal aquifers subjected to high risk of sea water intrusion. The situation may be aggravated by over-pumping of existing boreholes and cave-wells especially during dry seasons. Water quality data from some existing boreholes have shown an alarming increase in salinity and electrical conductivity of the water indicating that sea water has started to intrude freshwater aquifers. Thus research is needed to identify water catchment areas, address issues of seawater intrusion and its impact on groundwater resources as well as safeguard and improve the environmental profile of the water catchments.

### **2.9.7 Alternative Water Sources**

Zanzibar depends on groundwater for its water supply mainly through boreholes, springs, cave wells and shallow wells. These are found in different areas of the Islands under various aquifer conditions. However, due to increasing demand and other problems such as human encroachment and over abstraction, these aquifers have been rendered inadequate. It is imperative therefore to look for other sources to meet over the growing demand. Alternative sources include desalination and water harvesting among others. This research area is aimed at looking at the ways and options for harvesting and collecting water as an alternative source of water supply.

## **2.10 NATIONAL HERITAGE**

National Heritage is composed of two aspects - cultural heritage and natural heritage. Cultural heritage is the physical artifacts or cultural property and intangible attributes of a group or community that are inherited from past generations, maintained in the present and

bestowed for the benefit of future generations. Examples of tangible materials are buildings, monuments, archaeological and historical sites, architectural works and books, and works of art and artifacts; while intangible cultural materials are folklore, traditions, language, performing arts and mythology. Natural heritage encompasses landscapes, forests, ecosystems, flora and fauna, botanical and wild gardens, as well as the ocean and ocean products. Within natural heritage falls also historical culture, which involves the people's historical practice and experience of social relations, food as well as social, political and economic life. Heritage is important for people to anchor their identity and values.

Although Zanzibar has a vast cultural and natural heritage, which can be exploited for economic development, most people do not know how to put it to use for the tourism sector. The loss of this outstanding cultural and natural heritage can negatively impact local communities in getting information about their past. There is also little knowledge on the protection and management of heritage in the communities and within the government. But the conservation and development of the national heritage is also hampered by lack of financial resources, as well as threats from globalization, economic transformation, and commercial and infrastructural development projects.

By 2020, it is envisioned that the heritage sector would have strove to meet the national standards and expectations. Community awareness should be raised so that at least 50% of national heritage can effectively be used for social and economic gain.

The following are identified as researchable areas:

- Heritage management
- Historical buildings, sites, materials and archaeological studies
- Heritage and domestic tourism
- Natural heritage
- National language
- Intangible cultural heritage
- Artists and works of art

### **2.10.1 Heritage Management**

Heritage resources are under the management of government institutions. The resources are threatened by human and environmental pressure arising from limited awareness of protection and conservation. It is the target that by the year 2020, at least 25% of the sites should be in good condition and easily accessible. Public awareness on heritage should reach 60%. Thus, there is a need to conduct research on management and awareness in areas such as architectural, historical and aesthetic heritage. Priority research topics would include the capacity level in the management of heritage matters (including staff educational levels), management structures and marketing.

### **2.10.2 Historical Buildings, Sites, Materials and Archaeological Studies**

Zanzibar is endowed with many historical buildings, sites and materials whose value is enhanced by its long maritime connection with the outside world, especially Asia. The Stone Town is has been a World Heritage Site since 2000. There are about 91 documented historical sites, rich archival manuscripts, books and documents in Arabic, French and German, old and contemporary maps and plans, family histories, private papers and old stamps. But most of the historical sites are not well maintained, with 70% assumed deteriorating and getting more compromised every day. Thus, there is need to research on better ways of preservation, coordination of heritage sites, restoration of archaeological research as well as archival materials with the aim of improving the condition of the sites by about 30% by 2020.

### **2.10.3 Heritage and Domestic Tourism**

The Zanzibar tourism industry is based mainly on cultural tourism as well as natural tourism. However, domestic tourism is not significant in the Zanzibar economy. It is estimated that in 2007 the number of domestic tourists was only 47,636. The target is for the number to reach at least 300,000 in the year 2020. Priority research areas include the relationship between heritage and domestic tourism as well as heritage sites mapping.

#### **2.10.4 Natural Heritage**

There are 6 natural reserve areas in Zanzibar ranging from forests with caves to various animal sanctuaries containing such animals as Colobus Red Monkey (Kima Punju) and Zanzibar Ader's durker (paa nunga). There are threats to these reserves caused by fire, agriculture, and wood and honey harvesting. For instance, the Jozani Forest catches almost annually in January and December and there is thus high animal out-migration. There is a need for research that studies preservation of natural heritage – e.g. how to reduce or completely remove human activities in the reserves.

#### **2.10.5 National Language**

Kiswahili is the pride of Zanzibar and the backbone of Zanzibar's cultural identity. It is seventh in rank at the international level and is used in international fora such as the African Union and the East African Community. Currently Zanzibar hosts the headquarters the Swahili Commission for East Africa. It is important to research on how the language can make a larger contribution to cultural and economic growth. The areas may include vocabularies and terminologies on science and technology; Zanzibar's dialects; increasing international use of Kiswahili; songs and culture; and sociolinguistic aspects.

#### **2.10.6 Intangible Cultural Heritage**

Intangible cultural heritage encompasses the use of traditional knowledge, skills, performing arts, theater arts, folklore, oral traditions and mythology of all the communities. It is estimated that about 60% of this cultural heritage has either disappeared or been forgotten. Therefore, there is an urgent need of undertaking proper measures to restore and develop skills and craftsmanship of practitioners and bearers of the ICH. Priority research should study more about ICH in Zanzibar - including traditional dancing, folklore, performing arts, traditional values and ethics of Zanzibar, theater arts and mythology. Research should map the ICH and the challenges it faces as a basis for discussion on the strategies necessary to overcome the challenges.

### **2.10.7 Artists and Works of Art**

Works of art play a major role in the socioeconomic development of any country. Zanzibar has almost 250 registered artists, but a 2013 survey shows that the art industry contributes little to the social economy. Research is needed in areas such as the craft of carving; filming; children's plays and games; weaving; traditional dressing and food; traditional knowledge and skills; and theatre arts. The aim is to engage Zanzibaris directly or indirectly in the development and production of works of art for socio-economic development. Priority research topics in this area are centered on mapping arts and artists on the island. Marketing is also a priority research area as is the contribution of arts to the tourism industry.

### **2.11 EDUCATION**

Education is a most vital sector for national development. This is why many countries allocate a substantial amount of funds in their annual budgets for the growth and sustainability of this sector. Zanzibar is no exception, facing as it does numerous challenges in achieving its educational goals. Consequently, thorough research needs to be conducted, not only to identify challenges but also to recommend remedies to overcome these setbacks. In the education system, diagnostic areas such as access, relevance, efficiency, management, financing, quality and equity are very important in measuring the success of education in any country.

The following are the identified research areas:

- Curriculum development, assessment and evaluation
- Quality, relevance and quality assurance in education
- Teachers and the teaching profession
- Teacher education and teacher educators
- Education financing
- Science and Technology in Education
- E-learning and ICT in Education
- Adult literacy and vocational education
- Equity and equality in education
- Leadership, administration and management in education



### **2.11.1 Curriculum Development, Assessment and Evaluation**

The Zanzibar education policy of 2006 aimed at providing opportunity and increasing access to education from two to four years of basic secondary education. There is need to research on appropriate curriculum models that will focus on education for sustainable development and thus to have a better curriculum in place by the year 2020.

### **2.11.2 Quality, Relevance and Quality Assurance in Education**

The quality of education is determined by factors such as teaching facilities, adequate and qualified staff and a conducive learning environment. The key factor among these is the teacher. Quality teachers in most cases imply quality education. It is the case that most of the teaching that goes on in the classrooms consists of talk and chalk with little activity-oriented learning. The standard of examinations is not tailor-made to achieve a good quality of education. Furthermore, the current education offered does not guarantee self-employment for graduates. Quality assurance is done through the Inspectorate Unit, Teacher Centers and the Examination Council, with no coordination between them. Thus there is need to research on how these organs can be coordinated to achieve better quality assurance.

### **2.11.3 Teachers and the Teaching Profession**

Teaching is a noble profession. The standards of teachers must reflect this status. There has been mass migration from public to private schools and from the islands to the mainland and also attrition from the teaching profession to other fields. There is a high degree of teacher dissatisfaction in the public schools. Thus ways of improving teachers' working conditions need to be investigated.

### **2.11.4 Teacher Education and Teacher Educators**

Teachers facilitate learning processes. While there are three teacher training colleges and three Universities in Zanzibar, there is limited coordination between the Teacher Training Colleges (TTCs) and in-service training centers in terms of pedagogy and content mastery. Furthermore, the majority of teacher trainers are not competent in teacher education. By 2020, there should be in place a well-

researched mechanism that makes a close link between pre and in-service institutions.

### **2.11.5 Education Financing**

Investment in education leads to improvement of professional skills with direct implications for national development. Vision 2020 requires the reduction of inequalities by increasing access to services including education. Despite the allocation of about 20% of the national budget to education, more than 80% is used to finance salaries and other personnel emoluments. That means there is insufficient funding for complementary inputs including supplies, equipment, school maintenance and loans for students in higher learning institutions. There is a need to research on better financing strategies and thus increase access to quality education.

### **2.11.6 Science and Technology in Education**

Many students fail in science subjects and are unable to apply scientific knowledge in daily lives. Thus they tend to lose interest in science subjects. Efforts have been directed mostly to a few areas of science such as health and ICT to the detriment of other physical sciences. Also there are no industries in Zanzibar where scientists can conveniently practice. Thus, there is need to research on how all science subjects can be promoted at all levels of education. The aim is to build capacity for students in applying scientific skills and technology.

### **2.11.7 E-learning and ICT in Education**

As in any other developing country, the Zanzibar education system has to undergo substantial transformation, underscored by the growing application of new information and communication technology. ICT, e-learning and related services have in recent years gained commercial significance. The benefits that can be derived from effective utilization of ICT and e-learning include cost reduction, performance improvement, quality enhancement, multi-media application, consistency, convenience and creation of new products and services. In Zanzibar, only two government secondary schools (Zanzibar Commercial School in Unguja and Utaani

Secondary School in Pemba) offer ICT subjects while e-government is not yet introduced.

There is need to investigate on developing interactive e-learning and ICT systems to be used by Zanzibar Secondary Schools and Universities to support teaching and learning processes.

#### **2.11.8 Adult Literacy and Vocational Education**

Research indicates that nearly 83.4% of adults in Zanzibar are literate and thus over 16% are illiterate. Definitely, the poverty reduction strategies will prove successful if the illiteracy rate is further reduced. There are very few schools or vocational centers which offer courses such as carpentry, carving, blacksmithing, cookery, tailoring, electrical fitting, masonry, computer literacy, accountancy and finance. Thus there is need for research on how to increase the literacy level to 90% by 2020 and also to see more than 80% of form IV leavers get opportunities to join further education or vocational centers. The aim is to have graduates at various levels equipped with self-reliance and marketable skills.

#### **2.11.9 Equity and Equality in Education**

Education is among the fundamental human rights. In Zanzibar, girls' participation in some districts is low and education for children with special educational needs requires special attention. Currently, the enrolment in pre-primary education is only 34.4% in both public and private schools. However, the numbers of girls in primary and secondary schools is 50.1% 53.48% respectively. Unfortunately the number of girls at A-level (Form V-VI) is 49.55% and at University level only 39.55% in science subjects. Thus, research on how to promote equal access for all genders, the impact of inclusive education for people with disability and children with special needs is important to realize the goal of education for all.

#### **2.11.10 Leadership, Administration and Management in Education**

Management and administration of the education system is the responsibility of government. There are complaints that the Zanzibar education system especially in the areas of relevance,

equity, quality and standards is inadequate. Proper management and administration of education by competent leaders should be a public good. Thus there is need to research on better approaches for achieving effectiveness, equity, quality and relevance in the entire system of education by the year 2020.

## **2.12 SPORTS**

Zanzibar, like many other developing countries, values the sports industry for the purpose of creating income, improving health and gaining fame. In order for sports to be well practiced, participants should be well coached, managed, monitored, organized and assessed in a professional way. However, there is a serious shortage of physical education experts and professional sports administrators. Generally, participation and performance in international competitions in sporting activities in Zanzibar has decreased significantly compared to the period before 1995. Active participation in sports such as soccer has fallen from 1995, netball from 2000; athletics, badminton, table tennis and swimming from the 1990s. Thus, a well researched sports industry will bring about positive benefits to both the government and citizens.

The following are the identified research areas:

- Sports Facilities and Equipment
- Sports Talent
- Professionalism in Sports
- Sports Leadership, Management and Marketing
- Sports Tourism
- Sports and Disadvantaged People
- Sports and Health
- Sports Psychology
- Sports Ethics and Culture

### **2.12.1 Sports Facilities and Equipment**

Sports facilities and equipment should be well distributed in order for people to participate effectively in sports. Football has been given more attention than other sports and this has led to unequal distribution of sports facilities. There is also poor maintenance and

management of the available equipment and facilities. There are only two soccer grounds which are of acceptable standards and both are in towns. There are no indoor stadiums, swimming pools or gyms. Many sports clubs have no facilities of their own and the few that do are below standard. Therefore, research on the access to and provision of facilities and equipment is important for improving the sports industry. The aim is to improve existing facilities and establish new multipurpose sports facilities in every district. It is envisioned to have quality equipment and facilities for at least 16 sports associations out of 33 by 2020.

### **2.12.2 Sports Talent**

Talent is identified and developed in the early stages of children's lives, through sports academies, sports centers or schools. Currently, there is only one sports academy at Dole in Zanzibar which is also not fully functional. Therefore, research on the role of sports academies and sports centers in identifying, selecting and improving young talent and their impact on general performance of individual players, sports clubs and national teams in general is very important. The target is by 2020 to have at least one sports academy and center in each district of Zanzibar.

### **2.12.3 Professionalism in Sports**

Sports industry should be managed, organized and played by professional people; but this is a challenge to the sports industry in Zanzibar where there are still no professionals in many sports associations. In all the registered sports associations only 6% of the sports administrators are qualified. In all the registered schools only 3% of the PE teachers are qualified. This situation is claimed to hinder progress in the sports industry. Therefore, research is required on how to improve the sports industry and sports management to reach professional standards. The target is to have 40% of qualified sports administrators, coaches and officials and at least 20% PE teachers in schools that will fulfill national and international requirements by 2020.

#### **2.12.4 Sports Leadership, Management and Marketing**

Sports tournaments and competitions are essential for athletes to build their abilities; this is the level where sports managers and players assess their training and performance. However, due to poor qualifications, lack of expertise, skills and commitment among many sports leaders, managers and sports stakeholders, tournaments and competitions are few and are conducted unprofessionally. This is also affected by scarce financial resources to support the industry. Currently, it seems that only sports clubs from security forces are active due to financial and job security. Therefore, research could be conducted on how to establish and maintain competitions as well as sports marketing. The aim is to financially and technically empower sports clubs to participate fully in district, national and international competitions by 2020.

#### **2.12.5 Sports Tourism**

Sports tourism is one of the areas with high economic potential for both the government and athletes. In 2011 a Zanzibar mini triathlon attracted some foreigners and a few tourists from Dar es Salaam. But for the last six years, apart from the regional competitions in soccer, Zanzibar has not had an opportunity to host big international sports events. Therefore, research is needed on the role of sports tourism and how to promote it for socio-economic development.

#### **2.12.6 Sports and Disadvantaged People**

All international sports bodies are advocating for equal participation of women and men as well as people with disabilities. In Zanzibar, there are no well-established policies and measures that address the issue of gender equality and equal participation of people with disabilities in sporting activities. Also there is a limited number of women only sports; participation of women in “masculine” sports; and sports for people with disabilities as well as vulnerable children. Research in this area will aim at conducting a critical analysis on how to promote equal participation in sports at national and international levels. By 2020, the target is to increase the participation in sports of women, disadvantaged people, people with disabilities and vulnerable children.

### **2.12.7 Sports and Health**

One of the benefits of participating in sporting activities is to improve one's health. However, there are very few physicians or health experts involved in sports and exercise clubs in Zanzibar. There are no policies that require sports clubs to have health experts for assessing the health status of their members and athletes. Currently there are 32 registered physical fitness clubs with about 2,133 members. Research in this area is important for participants in sporting and exercise activities to have a better understanding of the impact of sports and exercise in boosting their health.

### **2.12.8 Sports Psychology**

Due to under performance in Zanzibar sports compared to past years, there is now a need to motivate players and their clubs whenever they perform well. Also the efforts of individuals and teams who have done well in the past should be recognized and documented. Their knowledge, skills, techniques and tactics should be used. Currently, there is no annual function of motivating players and sports at national level as well as commemorating sports legends. Given the existing research on this area in other countries, research in Zanzibar should focus on how to adopt and customise best practices and experiences from other countries to the Zanzibari context.

### **2.12.9 Sports Ethics and Culture**

All international sports bodies are campaigning against match fixing, corruption and bribery in the sports industry, while fighting anti-doping behavior. In Zanzibar there is no well established expertise, policies and measures that address these issues. Also there is the problem of match fixing, corruption and bribery by officials and sports administrators. People involved in sports might have limited knowledge of the effects of using performance-enhancing drugs in sports. Research in this area will aim at a critical analysis of ethics in sports and how experiences and practices from other countries can be adopted in the Zanzibari context.

The aim is to have a broader understanding of ethics in sports, sportsmanship, fair play, doping techniques in Zanzibar.

Traditional games and dances are among values of Zanzibar but their role is not well recognized and hence these practices remain neglected and undeveloped. Therefore, research will reveal their impact in preserving Zanzibari and African culture. By 2020, the target is to make society aware of the role and importance of traditional games and dances and the need to value them as part of cultural identity.

## **2.13 TOURISM**

Tourism is the top income generator for Zanzibar. It contributes significantly to the National GDP and 80% of foreign earnings. According to Government statistics at least 170,000 tourists visit Zanzibar annually, mainly for coastal tourism and cultural tourism. On average, from the 1980s to 2012 the tourism industry has been growing, with the government playing a major role in its promotion.

All sectors are involved in tourism either directly or indirectly. Examples of direct participants are Zanzibar Association Tour Operators, Zanzibar Association of Tourism Investors, Ministry of Agriculture and Natural Resources, Ministry of Livestock and Fisheries, Ministry of Infrastructure and Communication, Ministry of Trade, Industry and Marketing as well as Regions and Districts. Indirect participants are Immigration, Police, Commission of Labor, Zanzibar Investment Promotion Authority, Zanzibar Revenue Board (ZRB), Department of Environment, Department of Land and research and academic institutions. The current government motto is "Tourism for all". Therefore, with this motto, researching on tourism will enhance the stability of the sector in contributing to national GDP.

The following are identified as researchable areas:

- Tourism integration
- Tourism and socio-economic development
- Tourism and cultural heritage



- Tourism and the environment
- Employment opportunities and staff retention in tourism
- Marine tourism
- Eco-tourism
- Sports tourism
- Tourism and Infrastructure
- Revenue collection and poverty alleviation in tourism

### **2.13.1 Tourism integration**

It was pointed out earlier that several sectors are involved in tourism either directly or indirectly. Research needs to be done on the current situation of existing sector plans related to tourism; how these sectors can work together in order to contribute significantly to the tourism industry; and identify key public and private sector players and their roles at different points in the tourism chain. ICT plays a significant role to promote tourism. By 2020, it should be expected that integration among the sectors will have reached 60%, the sectors will be working together integrating tourism within their plans and Zanzibar will be branded as a high class tourist destination in the world.

### **2.13.2 Tourism and Socio-Economic Development**

Hotels require various local products such as food, vegetables, seafood and furniture. Tourists also need local handicrafts to take as souvenirs. . There are over 325 hotels which require these products, most of which are imported from the mainland and other countries. Most local products lack proper packaging and branding and thus do not meet international tourism standards. There is need for more economic analysis on various products and services available in the tourism industry, the market of local products and their status, and tourism and poverty alleviation.

By 2020 Zanzibar products such as cloves should be properly branded as originating in Zanzibar. Also Zanzibar should have sufficient products to satisfy the tourist market demand, with at least 60% of the villages or districts having markets for selling high quality local tourism products.

### **2.13.3 Tourism and Cultural Heritage**

One of the new developments in this area is cultural tourism, now taking place in various villages. Attractions include spice tours, ngalawa races and village tours where tourists get opportunities to learn about local culture and participate in the cultural activities. For example, some communities offer local food-cooking classes. Some of Zanzibar's annual festivals have acquired international status, for example Zanzibar International Film Festival (ZIFF), Mwaka Kogwa and Sauti ya Busara. There is also the newly introduced cultural festival of Mangapwani. However, most of these festivals are initiated by foreigners although they involve local participants. Some like Mwaka Kogwa are interfered with by alien cultures and may lose their originality and meaning. The Mangapwani one and Tamasha la Mzanzibari may be the ones worth emulating.

Studies are needed on cultural attractions (traditional music, festival, film-making and dance) that can be used to promote tourism; the role and importance of culture in the modern tourism industry; tourism culture and communication; tourism and religious influences as well as public perception of tourism, including paintings, handicrafts, music development, and negative influences of tourism, such as drugs, prostitution, violent crime and corruption.

It is envisioned that there would be at least 10 community-initiated festivals and more cultural tours which will attract more tourists.

### **2.13.4 Tourism and the Environment**

About 170,000 tourists visit Zanzibar annually, accommodated in about 325 hotels. The hotels use a lot of water for bathing, swimming pools and laundry. Community uses an average of 93 liters per day per household whereas the average consumption per room varies 686 liters per day in guest houses up to 3195 liters per room per day for five star hotels with average of 1482 liters per room per day. They also use a lot of plastic water bottles which are improperly disposed of.

There are several impacts brought by hotel construction, resulting in

the destruction of the natural landscape. These include inappropriate waste disposal, lack of water treatment plants, mining of sand from the beaches to decorate hotel pavements thus indirectly contributing to soil erosion, tree cutting, and increased usage of coconut leaves for thatching roofs. Research is therefore necessary to investigate the relationship of tourism to the environment; the impact of climate change on tourism; the existing tourism master plan and policies related to tourism; as well as tourism and water usage. Other priority research topics would be the recycling of waste products from tourism, and community awareness of the need to manage the environment for tourism development.

By 2020 it is expected that the tourism master plan would have been revised and implemented according to the rules and directions of land use planning, zoning, densities and environmental protection in each area. New investments will have to comply with the existing rules of undertaking Environmental Impact Assessments before construction and follow-ups at least every 3 years. At least 70% of hotels with high tourist capacity should have water treatment plants. Uses of sand from beaches should be to be well controlled by 90%. Recycling systems should be introduced and proper solid waste management put in place.

### **2.13.5 Employment Opportunities and Staff Retention in Tourism**

The tourism sector is expected to create employment opportunities for Zanzibaris. However, most employees in the sector are from outside Zanzibar, especially in the areas of waiting, massaging and henna painting. Overall, tourism provides about 3% direct employment and 4.5% indirect employment. Despite the fact there are also local people employed in the sector there is still public dissatisfaction with the rate of employment, positions held and poor salaries due to low education levels in tourism skills.

Research would focus on community employment, skills and employment positions, general participation of the community, and capacity building within the sector. It is expected that the number

of local employees will rise. Also at least 100 students will have graduated with the relevant tourism skills at diploma level and 50 at degree level.

### **2.13.6 Marine Tourism**

Marine tourism is taking place along the coast and in marine environments such as coral reefs, mangroves, coastal forests, the sea, the islets and the beaches. At least 75% of tourists to Zanzibar visit the coast and the marine environments. They enjoy the white sandy beaches of Zanzibar and the pristine coral reef sites. There is need for research studies on value chain analysis, positive and negative impacts of diving clubs and marine sports, impacts of diving and boat anchorage on reefs, sustainable utilization of coastal and marine resources; and demand and supply of fish resources in tourist hotels. By 2020 it should be known how many tourists come to Zanzibar specifically for marine tourism. Permanent mooring points have already been established in selected popular sites.

### **2.13.7 Eco-tourism**

Ecotourism is about uniting conservation, communities and sustainable travel. This means that those who implement and participate in ecotourism activities should follow the ecotourism principles such as minimizing impact; building environmental and cultural awareness; providing positive experiences for both visitors and hosts; providing direct financial benefits for conservation; providing financial benefits and empowerment for local people; raising sensitivity to host countries' political, environmental, and social climate principles of ecotourism; reducing over-consumption and waste; involving local communities; and using resources sustainably. Research should be focused on how to engage stakeholders in sustainable eco-tourism; sustainable carrying capacity of the ecosystems; policies and regulations to promote eco-tourism

### **2.13.8 Sports Tourism**

The most popular sports in Zanzibar are football and netball. Other sports like swimming and indoor games are practiced by only a few

groups. Athletics occur mostly in schools and military institutions. There is need for research on the kinds of sports which have a potential to contribute to tourism in Zanzibar and the impact of water sports like kite surfing on the marine environment. By 2020 it is expected that these kinds of sports will be introduced to attract more tourists. Zoning will have to be introduced for water sports to avoid conflicts e.g. among seaweed farmers and fisher folk.

### **2.13.9 Tourism and Infrastructure**

The coverage of infrastructure in the tourism sector, i.e. airports, seaports, roads, is estimated at about 30%. Thus, there is need for research on the quality of services provided at the entry points; the source and amount of energy required in the tourism industry and road networks to tourism zones. High class tourism should be in place (services, hotel types, improved recreation, health care and hotel classification).

### **2.13.10 Revenue Collection and Poverty Alleviation in Tourism**

Current levels of tax collection in the tourism sector are low. About 40% of the collection ends up in the hands of individuals instead of the government. There is need for research on sources of revenue, collection mechanisms and control. By 2020 there should be a good mechanism of tax collection 50% of which will be remitted to the government. A credit card mechanism should be in place.

## **2.14 INFORMATION**

The information sector encompasses all information services, including print, electronic and new media for delivering or acquiring information. Zanzibar media has a long and distinguished history. The first newspaper was published as early as 1875 when a printing machine was introduced. Radio services started in 1951 and in 1974 the first colour TV in Africa was installed. However, the print media industry in Zanzibar is in decline - falling from over 40 newspapers and periodicals prior to 1964 to only one daily newspaper Zanzibar Leo today. This paper, with a circulation of about 2,000, has a sister Sunday paper covering a range of sports, culture and arts.

Following trade liberalization in 1992, enabling policies were introduced in various sectors including the opening of air waves in broadcasting through Act No. 7 of 1997, broadcasting policy of 2008, Amendment of Newspaper No. 5 of 1988 and Information Policy of 2006. These policies and legislation have allowed public and private sectors to invest in diverse, plural and advanced electronic and print media. Zanzibar has entered the digital broadcasting era, using terrestrial, satellite, cable and fiber optic means of distribution of signals.

There are two public and eight commercial radio stations, five subscription television channels, two community radio stations and two cable operators. All these electronic media are working under self-monitoring basis and are licensed by law. However, the use of new and social media is still limited to the middle class and urban dwellers. Due to poor economic conditions in villages most people do not enjoy the available services.

The journalist population is estimated at 380, 30% with little training, 45% with certificates, 15% with diploma holders and 10% with first degrees. This is a challenge for the development of media industry in Zanzibar.

By 2020, it is expected that the media industry would have expanded by increasing not only the quantity of media houses and qualified staff but also by extending services to the marginalized rural areas of Zanzibar and the peripheral areas on the coast of Tanzania.

The following research areas are worthy of attention:

- media and democracy
- media, culture and globalization
- media and poverty reduction
- rural press
- social media and society

### **2.14.1 Media and Democracy**

Current information policies and media laws are not effective in

facilitating media functions and improving optimal information sharing. As a result, there is still infringement of media freedom in most media houses. Women representation in the media is less than 10%.

Research on the media needs to focus on better ways of mainstreaming democracy in the media - effective policies and laws; enhanced media freedom; increased diversity in private newspapers, journals and magazines; and sensitivity to gender issues.

#### **2.14.2 Media, Culture and Globalization**

Currently there is cultural erosion and lack of organized media institutions in addressing cultural issues such as sports, films, theatre and arts. The emergence of new media, including social media and cable TV, has posed a particular challenge.

The rapid rise of global media is having effects on life styles, culture and education. More than 70% of information available to the youth is from foreign sources.

So, there is need to research on how the problem of cultural erosion can be addressed in this globalized era, and the effect of globalization on development and employment. By the year 2020, it is expected that there would be improved media coverage to address cultural standards and social ethics.

#### **2.14.3 Media and Poverty Reduction**

Media practitioners have a leading role to play in the sustainable development of Zanzibar. Yet, development issues such as climate change, the economy and poverty reduction generally fail to receive media attention. The few reports posted are mainly from press releases and seminars; there is no investigative reporting. The media are more inclined to political information and acting as public relations agents to the government. The reason could be the lack of trained journalists. Thus researching on the contribution of media in poverty reduction is important. Priority research topics in this area

would include the contribution of media to poverty reduction at all levels and the relationship between a rural press and economic progress.

#### **2.14.4 Rural Press**

Information sharing in rural areas is important for their growth. However, the media in the rural areas are not as effective as in urban areas. There is no rural press in Zanzibar since 1992. This has led to a lack of knowledge of local and national issues resulting in marginalization of the rural population -making decisions and informed choices. Research on media involvement in rural areas is therefore vital. By 2020, there should be a restoration of the rural press and increased information sharing on local and national issues.

#### **2.14.5 Social Media and Society**

Currently, the rural population is excluded in social networking due to the problem of affordability and accessibility. Research is required to investigate ways in which the exposure of the rural population to both conventional and new media can be increased.

### **2.15 LABOR AND EMPLOYMENT**

The Zanzibar labor force has been growing rapidly, outstripping employment opportunities. Thus, employment remains a major concern of the Revolutionary Government of Zanzibar.. Labor force statistics show that the labor force is predominantly engaged in traditional agriculture and the informal sector. ILFS 2006 indicates a total of 513,032 (aged 15+ years) persons being economically active out of a total working population of 614,987. The majority (308,436) equivalent to 60.1%) were found in the rural areas compared with 204,596 or 39.9% found in the urban areas; male employees dominated, making up 51.5% with females constituting 48.5%. The participation rate peaks at age group 45-49 for males and 40-44 for females, although males enter the labor market earlier and in bigger numbers.

The Zanzibar Employment Policy and its derivative the Youth



Employment Action Plan, and the over-arching national development plan MKUZA 2007-2010, demonstrate in very definite terms the government's commitment to address labor and employment challenges. Increasing decent jobs and self-employment opportunities is a fundamental means of realizing its citizen's right to work, as well as a means to sustained economic growth, poverty reduction and the attainment of the goals of Zanzibar Vision 2020 and the MDGs.

Given the above context, the following would constitute the priority researchable areas:

- Entrepreneurship development
- Employment in Zanzibar
- Labor productivity
- Labor market information
- Occupational safety and health (OSH)
- Capacity of labor institutions
- After school training and employment opportunities
- Poverty, employment and drug use
- PwD' status, empowerment and employment opportunities

### **2.15.1 Entrepreneurship Development**

Entrepreneurship and enterprise development is a very crucial aspect in the promotion of economic growth and development. By offering practical entrepreneurship training courses, and mentoring young people interested in business to engage in entrepreneurship, the availability of jobs will increase. Research in this area can focus on the entrepreneur's products and marketing, and institutional capacity of Zanzibar's academic institutions providing entrepreneurship education. Research would also look at the formation of cooperatives and their contribution in providing employment.

### **2.15.2 Employment in Zanzibar**

The Government is the biggest employer, its employees increasing from 28,108 in 2008 to 31,196 in 2009 (11.6% increase). In the private sector the number of employees increased from 9,969

employees in 2008 to 11,897 in 2009 (HBS 2010). Unemployment in Zanzibar is both a rural and urban phenomenon, with the youth, women and people with disabilities being more adversely affected. The overall unemployment rate in Zanzibar is about 4.4% as per HBS of 2009/10 with youth unemployment at 17.1%. The Zanzibar Vision 2020 sets a target to increase employment by 50% in tourism, 25% in agriculture and 30% in other sectors as well as reduce youth unemployment rate from 17.1% to 10%. There are also targets to increase the capacity of human resources to take up the emerging employment opportunities. There is a further focus on the employability of the vulnerable groups as well as access to credit. Research in these areas will assist in meeting the said targets with priority given to topics that address attitudes and mindsets, labor market needs, competence of graduates and immigrants and emigrant remittances.

### **2.15.3 Labor Productivity**

Labor productivity is the efficiency of labor at workplaces with relation to development of the nation and is concerned with the quality of service delivery and quality and amount of goods produced or manufactured, in relation to the inputs invested. By 2020 the aim is to improve labor productivity in order to push Zanzibar's development. Specifically, there should be emphasis placed on analyzing and researching the optimal productive working hours, quality of services and goods, labor relations as well as labor efficiency with regard to community development.

### **2.15.4 Labor Market Information**

There is a need to establish a Labor Market Information system (LMI) with data collection tools to collect information on job seekers, employers, and academic institutions as well as a website to publicize/share information between job seekers and employers within and outside Zanzibar. The target is that by 2020 the LMI should be fully operational and be able to provide adequate information related to jobs. Also, it should provide regular/periodic information on employment status as well as adequate information on graduates in all disciplines with linkages between public and private institutions.

### **2.15.5 Occupational Safety and Health (OSH)**

MKUZA II 2010 recognizes that a healthy and educated population leads to increased productivity, better income distribution and higher standards of living. OSH goes beyond the safety and health for the workers concept and applies to all public and private initiatives that provide income or remittances to the poor, protect vulnerable groups against livelihood risks, and enhance the social status and rights of the marginalized. Research is critical to examine specifically OSH in relation to occupational accidents and disease surveillance in the tourism sector.

### **2.15.6 Capacity of Labor Institutions**

Despite the strong government commitment to address labor and employment challenges through a review and reform of labor laws and related laws and policies and established institutions, the government is constrained by inadequate capacity of the human resources to implement the labor laws. By 2020 the target is to have sound labor relations at work places as well as human resources and institutional facilities.

### **2.15.7 After School Training and Employment Opportunities**

The Zanzibar education system is weak in skills development and is consequently unable to produce competent graduates who can meet the demands of the 21st century labor market. There are only 3 public vocational training centers in Zanzibar to cater for more than 8,600 school leavers annually. There is a need for skills development programs and professional courses demanded in the labor market. By 2020 the aim is to build a vocational training center in each district and have policies and programs developed to encourage youth employment, specifically an apprenticeship policy and a vocational training policy. Research should also inform career selection and curriculum development in relation to labor market demands.

### **2.15.8 Poverty, Employment and Drug Abuse**

Drug abuse has become one of the rapidly emerging socio-economic problems in almost all urban and semi-urban areas in Zanzibar.

Recent studies have shown that youth of various ages are the most affected by the drug menace, which means the human workforce is significantly depleted. Poverty and unemployment are cross-cutting issues, which need to be addressed from different sectoral policies, programs and laws. However, questions which have not been adequately addressed by most research work on drug use so far include the linkage between poverty, employment and drug use. Is there any direct relationship between them? Or is it related merely to the easy availability of drugs due to either globalization or other factors.

### **2.15.9 PwD Status, Empowerment and Employment Opportunities**

Generally, people with disability (PwD) face various challenges when it comes to employment opportunities. Various studies have shown that “the employment rate of working-age people with disabilities is well below that of their nondisabled cohort, regardless of what national survey is used or how disability is measured.” (Stapleton et al. (2006), “Dismantling the Poverty Trap: Disability Policy for the Twenty-First Century”, 84(4), pp. 701-732), Other studies have also shown that people with disability are limited not by their physical or mental impairments, but also by society’s failure to consider their needs when designing employment and empowerment opportunities. PwD need special employment conditions, which need to address societal perception that PwD cannot be effective in employment or income generation; inadequate social protection for PwD; unfair competition between the able bodied and PwD, inadequate/inappropriate education for PwD, and extremely few opportunities for PwD technical education/training. About 90% of PwD have no permanent jobs. Rural against urban differences are also highlighted with urban respondents having better access to employment than those from rural areas. Thus, it is important to undertake a comprehensive survey of factors that make PwD unemployed and to find some practical measures to solve the problem. Also, the optimal types of employment for PwD by gender, age, education and socioeconomic status and disability, need to be investigated

## **2.16 MACROECONOMIC AND FINANCIAL MANAGEMENT**

Macroeconomic stability is a major prerequisite for real economic growth. This requires more effective macroeconomic management, pursuit of sound macroeconomic policies and greater fiscal discipline. A stable macro-economic environment with low inflation, low current account deficit and reasonable growth is essential for creating sustainable development. Both Vision 2020 and ZSGRP were aimed at developing higher economic growth and improve delivery of quality service. Goal 1 under ZSGRP II focuses on creating an enabling environment for stimulating and sustaining growth and providing adequate economic and financial systems that will support, promote and increase long term investment for sustainable socio-economic development. This includes prudent fiscal and monetary policies that are supportive to ZSGRP.

The creation of sustainable development is achieved when there are effective monetary and fiscal policies to ensure low inflation, strong financial and debt management, low lending and saving rates, a vibrant private sector and robust resource mobilization. Zanzibar has experienced volatile GDP growth over the last few years that varied from 5.3% in 2008 to 7.0% in 2012. Despite the fact that Zanzibar's economy has remained positive even during difficult times of the global financial crisis, the country is still facing a number of internal constraints and drawbacks. These include poor infrastructure and climatic changes and their impacts on growth of the productive sector, particularly tourism and agriculture. Improvement of macroeconomic and financial management therefore deserves serious consideration for realization of growth and development.

While macroeconomic conditions are very important and necessary for healthy growth of Zanzibar's economy, by themselves they are not sufficient. Moreover, they are not in the hands of the Zanzibar policy makers. On the other hand, microeconomic factors are the foundations on which a set of political, legal, sound fiscal and monetary policies should be built. Microeconomic factors related to economic efficiency, individual freedom, household income and ability to exploit individual talents, as well as equity are indispensable

in making macroeconomic interventions more effective. While equity calls for a fair distribution of wealth and income in a society, efficiency has an impact on the best use of available resources.

A combination of appropriate macro and microeconomic factors can turn Zanzibar small and medium enterprises (SMEs) into major contributors to the Isles economy in terms of employment creation, talent development, income generation and improved government revenue-collection. For this to be realized, it is important for the government to create an enabling environment for the private sector to thrive in production, profit making, retain earnings, pay due taxes and contribute significantly to the wealth creation process.

Based on discussion on macroeconomics and the financial management sector and the ranking exercise, the followings are the seven ranked priority areas for research:

- Informal Micro-Credit Schemes
- Microfinance sector development
- Broadening the tax base and mechanisms for revenue collection
- Exchange rate impact
- Debt management and sustainability
- Public financial corporations
- Dollarization and economic growth
- Fiscal relations
- Expenditure management
- Development banks

### **2.16.1 Informal Micro-Credit Schemes**

Informal Microfinance Schemes are an important source of loans for small scale entrepreneurs. Most borrowers in Informal Microfinance schemes take loans for small businesses. However, they are not able to pay back the loan due to failure or poor performance of their enterprises. The aim is to establish appropriate mechanisms for financing small businesses and a support services system by 2020.

### **2.16.2 Microfinance Sector Development**

The development of the microfinance sector, comprising Savings

and Credit Cooperatives (SACCOs), Financial NGOs and Village Saving loan Groups (VLSG), is in the infancy stage in Zanzibar. Recent findings show that microfinance institutions (MFIs) in Zanzibar have limited outreach and that the very poor people are relatively less covered. Furthermore, findings show high regional disparities in the number of clients reached by MFIs, with a high concentration of clients in the Urban West region (Financial Sector Review 2013). Research in this area aims to increase outreach of microfinance services to rural areas and serve the poorest segment of the population in order to scale up poverty reduction strategies.

### **2.16.3 Broadening the Tax Base and Mechanisms for Revenue Collection**

The Government is striving to broaden its tax base and revenue collection in order to finance development programs and projects. Based on the available statistics, revenue collection reached TZS 294.1 billion in 2012/2013. Despite government efforts in increasing the level of revenue collection, about 80% of domestic revenue collection is used on the Government's wage bill; this, coupled with revenue leakages, makes it difficult for the government to finance development projects. Also, the tax base is narrow forcing the Government to increase tax on the same commodities and sources every financial year. Research in this area aims at widening the tax base and improving revenue collection mechanisms from TZS 294.1 billion in 2012/2013 to TZS 800 billion by the year 2020.

### **2.16.4 Exchange Rate Impact**

Exchange rates in Zanzibar have traditionally proven very difficult to model and forecast due to Zanzibar having no control on monetary policy. Further, currency crisis and exchange rate regimes in emerging markets have had an adverse impact on Zanzibar's monetary policy. The exchange rate has considerable impact on inflation, export and import prices and investment and ultimately on economic development. The exchange rate of 0.96% on year basis is too high in realizing real growth. Also, there are low levels of import and export and a low pace of investment growth rate (capital investment for the year 2012 was USD 59 mill). Studies in this area should aim to find ways in which to reduce the percentage

of exchange rate and increase the contribution of import and export to GDP through reduction of imports and increase of exports.

### **2.16.5 Debt Management and Sustainability**

One of the major obstacles for Zanzibar's economic development is its crippling debt and as such the management of government debt portfolio has assumed critical importance given the country's high level of debt in relation to GDP as well as the volatility witnessed in her external sector. Recent data show that the level of Government debt has reached TZS 255.9 billion and the ratio of outstanding debt to GDP is 18.6%. One of the critical questions to answer is what level of debt the economy can sustain. Research on effective debt management and sustainability will aim to minimize the level of debt by 60% by 2020 which is essential and significant for sustainable development.

### **2.16.6 Public Financial Corporations**

Financial development in terms of financial institutions and markets is crucial for economic growth. Public financial institutions in Zanzibar include the People's Bank of Zanzibar (PBZ), Zanzibar Insurance Corporation (ZIC), Zanzibar Social Security Fund (ZSSF) and ZRB. Financial institutions allow the efficient transfer of funds between borrowers and lenders and hence facilitate business activities. The 2012 Zanzibar Economic Survey shows that the public financial corporations' contribution to GDP is only 1.8%. Research is needed to investigate the efficiency of public financial corporations and their contribution to the growth of the economy. Focus should be placed on assessing the current situation of the institutions and to identify areas that will increase their contribution to economic growth from the current 1.8% to 4.5% by year 2020.

### **2.16.7 Dollarization and Economic Growth**

The use of foreign currency for daily transactions has accelerated from the 1990s as a response to poor macroeconomic policies and rising instability. Supporters of dollarization have argued that countries that give up their currency will be able to engage easily in monetary and macroeconomic management. Public finances will



stay in balance, macroeconomic policy will be credible, and the external accounts will move within reasonable bounds. According to this view, dollarization will have two major positive effects on economic performance: First, inflation will be lower in dollarized than in non-dollarized nations. Second, countries that give up their currency will tend to grow faster than non-dollarized countries. While dollarization increased in Zanzibar, there is no research investigating its impact on economic growth. Research in this area is needed to fill this gap.

#### **2.16.8 Fiscal relations**

There are central and local Government sources of revenues in Zanzibar - those that are controlled by the Central Government and those under the control of the local authorities and district administration authorities. Research in this areas should aim to map existing responsibilities and relationships with a view to clarify the different institutions' revenue collection responsibilities. Furthermore, the research should identify potential sources of revenue.

#### **2.16.9 Expenditure Management**

Under the national budget, expenditure has to be made based on the prepared budgets endorsed under the law. The three main expenditure areas are the Executive, the Judiciary and the Parliament. Expenditure for each of these three bodies is seen to increase annually, creating some challenges to the Government. The expenditure of some of these institutions is increasing more than that of others, hence there is need to research on the appropriate expenditure levels for each of these bodies based on their respective functions.

#### **2.16.10 Development Banks**

The banking sector in Zanzibar is not accommodating the needs of the people. Additionally, the microfinance sector is small and informal and most customers have to depend on the commercial banks for their financial needs. Because of high interest rates charged by these banks, various groups have now resolved to establish cooperative banks. These include the Women's Bank,

the Cooperative bank and the Agriculture Bank. There is need for research into the potential of these different types of banks, their relevance and social and economic impact for the customers and the nation as a whole.

## **2.17 PRIVATE SECTOR, BUSINESS ENVIRONMENT AND PUBLIC PRIVATE PARTNERSHIPS (PPP)**

The Private Sector and PPPs are important to the economic development process of any country. In realizing this fact, the Government in the 1980s declared that the Private Sector is an engine of economic development and took deliberate measures to develop the Private Sector as articulated in the economic reforms like Vision 2020, ZSGRP I & II, and the MDGs. Cumulatively, the aim of these measures is to speed up the development of the economy which will facilitate the reduction of poverty and make Zanzibar a middle income country by the year 2020. Currently, the Zanzibar Chamber of Commerce (ZCC) plays a key role in this issue.

ZSGRP II under Cluster I articulated the fourth goal of establishing a vibrant private sector in the country for economic growth and various interventions were mentioned including mechanisms to improve public-private linkages by promoting better coordination; information exchange; building the capacity of the private sector in business management skills; promoting access to technology; creating business opportunities for the private sector, promoting access to markets; facilitating access to credit; and assessing the contribution of the private sector to the economy. It is expected that the private sector will shoulder a bigger proportion of the cost, mainly in the productive sectors and some of the social-economic infrastructure. In doing so, increasing private sector participation in economic activities would reduce demand for public funding, hence allowing government resources to be channeled to more strategic public investments with the role confined to the provision of public services, policy management and implementation, monitoring and evaluation and promotion of an enabling environment (regulatory framework) for private sector investment in production, trade and in the provision of some social and economic services.

According to the 2010 Doing Business in Zanzibar report, Zanzibar has been ranked 167 out of 183 countries on ease to credit access. Other challenges in the sector include the existing legislative environment governing business in Zanzibar, business registration and licensing, taxation, trade regulations as well as labor regulations. In addition to the above, there remain challenges in access to finance, procurement opportunities and education and training considerations that should be working in tandem to create an enabling business environment.

Based on the ranking exercise for the prioritization process, the following are the researchable areas:

- SMEs and entrepreneurship
- Public Private Partnerships
- Trade and Marketing
- Agro-processing and light manufacturing
- Trade facilitation/Infrastructure
- Value addition, Quality and Standards
- Business Regulatory Environment

### **2.17.1 SMES and Entrepreneurship**

Most businesses in Zanzibar are within the SME sector. However, there is poor access to credit for most of SMEs on account of stringent conditions including high interest rates and collateral security imposed by financial institutions. Based on SMEs analysis, about 62.2% of entrepreneurs do not have access to credit and about 13.2% have collateral problems. This calls for a reduction of lack of access to credit to 15% by 2020 from the current 62.2 percent as well as to increase access to collateral. Although the trade policy and SMEs development policy both seek to expand opportunities, encourage SMEs as well as large scale units, encourage production and export value added agricultural products, there is need for research which aims at reducing difficulties in accessing finance from 62.2% to 30% by the year 2020 in order to develop an SME sector for all economies in terms of generating employment, income, and alleviating poverty.

### **2.17.2 Public Private Partnerships (PPPs)**

Recognizing the important role that PPPs can play in terms of mobilizing resources, increasing efficiency, and transferring technology, the Government passed the Concession Projects Act (CPA) in 1999. In accordance with the CPA, a central PPP unit was established under the Department of Economic Management in the Zanzibar Planning Commission in 2012. As of March 2014, the Government was in the process of drafting a PPP policy, updating the legal and regulatory framework for PPPs, developing operational guidelines for the PPP unit, and identifying a potential PPP projects.

Priority research areas under this topic would be to provide a comprehensive overview of different types of PPP project arrangements (for example, Build Operate Transfer (BOT), affermage, and concessions) focusing on the potential strengths and weaknesses of each approach in the context of Zanzibar; the impact of non-PPP legislation, regulations and policies on the PPP regime in Zanzibar; comparative studies of different legal, regulatory and institutional frameworks for PPPs around the world; and assessing PPP awareness and capacity in Zanzibar amongst relevant stakeholders. Such studies should also make recommendations to address any gaps found.

### **2.17.3 Trade and Marketing**

Zanzibar negotiated its market access as part of United Republic of Tanzania, in international and regional trade arrangements. For market entry for its major products including cloves, seaweed and other spices, Zanzibar largely sells its products in bulk. However, the customers Zanzibar trades with are usually middlemen rather than the final buyers; hence Zanzibar receives smaller returns for its products. According to one economic survey the trade deficit grew by 98% in 2012 (Socio-Economic Survey, 2012). Zanzibar currently faces challenges in negotiating both regional and international markets access. This means that its products fail to reach their niche market and gain export benefits. Therefore, by the year 2020 Zanzibar should target to reach potential customers directly which is expected to increase prices of its products by 20%. It is also expected to reduce the trade deficit by 10% by 2020.

#### **2.17.4 Agro-Processing and Light Manufacturing**

According to the Zanzibar economic survey of 2012, industry grew by 9.2% with 11.7% shares of GDP. Specifically, the manufacturing sector has contributed about 3.4% to GDP with growth of 0.1 in 2012. Most of Zanzibar's manufactured exports are in textiles and garments, wood products, coconut oil, arts and handicrafts, spices as well as products from agro-processing and traditional weaving. There are many challenges facing the industries in Zanzibar including inadequate technical expertise and skills, low capacity for financial planning and lack of adequate tools to manage and control the development process. Others are inefficiency in the importation of raw materials, equipment and spares, limited business start-ups (industrial entrepreneurship base), high risk aversion among existing firms and a poor investment climate. All these result in underperformance, unreliable supply and high cost of utilities. The situation calls for further research on how to improve industrialization and expand its contribution to GDP to at least 10 % percent by 2020.

#### **2.17.5 Trade Facilitation/Infrastructure**

Currently Zanzibar depends solely on a single port, Malindi, for entry and export all its products. Despite periodic rehabilitation, the pace and equipment for port operations have been lagging behind the demand. Insufficient trade facilitation especially at the point of entry has affected trade transactions, resulting in a decrease of trade, products, and profit accruing therefrom. Such acute deficiency reduces Zanzibar's competitiveness considering its geographical location. By year 2020 Zanzibar aims to increase trade facilitation by either improving the existing facilities or building a bigger port of entry. The expansion of trade facilities should increase the volume of trade and value by 20%.

#### **2.17.6 Value Addition, Quality and Standards**

In considering quality, the Government formulated the Zanzibar Standard Act in 2010 which has led to the formation of the ZBS, whose function is to set standards and issue certification. Despite the reliance on agriculture, there is little consideration placed in maintaining quality through the entire value chain (pre-production,

production, harvesting, handling etc). For example, cloves are a major export, yet farmers dry their cloves by the roadside. There is minimal value addition, resulting in reduced returns for the farmer. For example, the price of seaweed has been declining for many years (around TZS 300-400/kg). With value addition it can be sold up to TZS 10,000/kg, which would constitute a 2400 percentage increase. In order to get more income from products there is need to increase value addition to about 50% by 2020 through research in this area.

### **2.17.7 Business Regulatory Environment**

In Zanzibar Town, a typical medium size company makes 48 different payments, pays 40.8% of its commercial profits in taxes, and spends 158 hours per year on tax compliance, including 26 hours on corporate income taxes, 60 hours on labor taxes, and 72 hours the value added tax (VAT). Also, in business incentives, the total value of tax exemptions granted in 2006-2010 in Zanzibar is estimated to be TZS 96.2 billion, equivalent to 46% of the country's total tax revenue and more than double the exemption rates provided in the region. The impetus for these incentives is mostly focused on the tourism sector. This calls for close attention and thorough research to ensure that Zanzibar is realizing economic benefits commensurate with the significant incentives it offers to some investors as well as research on the creation of an enabling business environment. It is expected that such research will provide a better solution towards diversifying incentives to other economic sectors such as industries, trades and other businesses, adjusting the scale of incentives particularly tax exemptions and possibly minimizing it to at least 10% of total tax revenue in 2020.

### **2.18 DEMOCRATIC PARTICIPATORY GOVERNANCE**

Good Governance is considered an important factor in the country's efforts towards reducing poverty. On this basis, Vision 2020 has singled out Good Governance as a priority while in the ZGRPS, Good Governance and National Unity are among the three major clusters singling out governance as a key factor towards the successful implementation of development initiatives in Zanzibar. Despite this,

building a strong foundation for good governance in Zanzibar has not been an easy task, mostly because of the political, social and economic contexts. One major initiative was that of 1984, when the existing Zanzibar Constitution was enacted. Amended ten times so far, it established, among other things, an elected legislature, a multi-hierarchy judiciary with security of tenure, a well defined executive structure and a Government of National Unity (GNU).

The implementation of MKUZA has been unsatisfactory due to various shortcomings: inadequate decentralization and a weak local government system leading to inadequate participation of grassroots players in public affairs, insufficient capacity for the enforcement of the legal framework, limited transparency and accountability within the state and among non-state actors, lack of awareness of good governance issues among the public and a misconception that good governance is the responsibility of only one ministry. Consequently, there is ineffective coordination of good governance initiatives and the weak legal framework is not supportive of effective and timely implementation. Given the importance of good governance, the sector deserves greater citizens' participation in democratic governance, strengthening the rule of law, respect for human rights and access to justice as well as improved democratic institutions and national unity. It is believed that implementation of MKUZA II which was established in realizing the MDGs, will improve the living standards of the people of Zanzibar and strengthen good governance.

In realizing the significance of Good Governance, the followings are the prioritized researchable areas:

- Public Sector Reforms
- Rule of law and Human Rights
- Prisons and Human Rights
- Political Stability
- Civil-Military Relationships in Good Governance

### **2.18.1 Public Sector Reforms**

The Revolutionary Government of Zanzibar has been undertaking a number of public sector reforms initiatives in response to problems

in public service performance. During the late 1980s and 1990s, the Government adopted cost containment reform measures including progressive disengagement from state owned enterprises, restructuring government institutions and freezing employment in the public sector. However, the Government realized that reforms based on cost containment philosophy undermine the capacity of the country to achieve sustainable development. Research is needed on various interventions which are expected to work in an interactive manner to produce the desired program outcomes as well as the goal of the medium term strategy including: strengthening institutions, structures and systems for service delivery, managing public servants, information and records management, reforming local government and program management.

### **2.18.2 Rule of Law and Human Rights**

The well established laws of Zanzibar are not always freely applied and practiced, which hampers the legal sector's ability to deliver justice efficiently and effectively thus occasionally triggering political and social conflict. MKUZA II identifies the following key problems faced by the legal sector: inadequate institutional and operational capacity; low public awareness on basic justice processes and rights; corruption; poor infrastructure; delays in delivery of justice and case backlogs, and inadequate legal practice and procedures. . Research in this area should focus on how best to enhance institutional and operational support for legal institutions and how to increase awareness of legal issues and access to legal aid for the most vulnerable.

### **2.18.3 Prisons and Human Rights**

According to the Tanzania Human Rights Report 2012, in 2011/2012 Zanzibar prisons received 479 offenders (462 men and 17 women) and 2,620 remandees (2,510 men and 110 women). The increasing population of inmates/remandees in prisons depletes the quantity and quality of service provided including even basic needs. The Government has been taking various measures to strengthen adherence to human rights, including the provision of proper clothes for detainees. Despite some improvements, prison conditions



remain unpleasant - inadequate food, overcrowding, poor sanitation, and insufficient medical care are pervasive. To fulfill the universal obligation of human rights, there is a need to undertake research in the area of prisoners' wellbeing.

#### **2.18.4 Political Stability**

The Government of National Unity (GNU) is constituted by two major political parties, CCM (Chama cha Mapinduzi) and CUF (Civic United Front). It was intended that GNU would bring a level of peace to Zanzibar's political reality. GNU has indeed decreased political and social tensions and incidents of violence and has generally brought mutual understanding and political tolerance. There is a need to conduct comprehensive research to help identify ways in which to sustain and improve political stability in Zanzibar.

#### **2.18.5 Civil-Military Relationships in Good Governance**

In Zanzibar, the armed forces (the army, police force and Zanzibar Special departments Kikosi Maalum cha Kuzuia Magendo (KMKM), Kikosi cha Valantia Zanzibar (KVZ), Kikosi cha Zimamoto na Uokozi (KZU), Jeshi la Kujenga Uchumi (JKU) and Mafunzo Zanzibar (MFZ) have a mandate to maintain peace and security in the country. The police and army are in principle controlled by the Union Government while Zanzibar Special departments are under the control of the Revolutionary Government of Zanzibar. Inadequate civic and human rights training and inadequate military infrastructure are among the obstacles facing the armed forces. Therefore there is a need to conduct research on how to improve civic education and human rights.

#### **2.19 GENDER**

In the promotion of socio-economic development in Zanzibar, the Government recognizes the particular challenges caused by gender inequality, and ensures that they are addressed through Vision 2020 and MKUZA II. Women in Zanzibar constitute more than 50% of the labor force and head about 21.3% of households (HBS 2010). However, ILFS 2006 indicates low representation of women compared to men in paid employment in the non-agricultural sector - 32% against 68% men.

The majority of women in Zanzibar work in the agricultural sector, where they account for 70% of the agricultural work force and 70% of the agricultural output.. However, their conditions have remained generally poor. Women's efforts to increase productivity are hampered by illiteracy, lack of appropriate technology, inadequate access to information, limited access to extension services and capital, as well as social and cultural factors that have compromised their rights to land and personal development.

As a result of the national priority setting exercise and the ranking tools provided, the following are the ranked researchable areas identified under gender:

- gender based violence (GBV) violence against women and children (VAWC)
- child development
- gender and development
- social protection
- family wellbeing
- youth, gender and participation

### **2.19.1 Gender Based Violence (GBV) and Violence against Women and Children (VAWC)**

Reports from professionals working in child protection and other evidence suggest that VAWC, sexual exploitation and abuse are significant problems, occurring at home, in workplaces, and in schools. Data compiled from the Department of Women and Children from 2008 to 2010 indicates that GBV and VAWC incidents have increased, with 329 GBV cases reported in Unguja and 443 in Pemba. Also data from the Department of Social Welfare (from December 2010 to March 2011) shows that a total of 347 child abuse cases were reported in Unguja and Pemba. Mnazi Mmoja hospital for example registered 946 cases of child abuse, 1,255 rapes and 671 pregnancies from rape between 2007 and 2010. To address the situation research on domestic violence, violence against men, GBV, VAWC and gender discrimination will be highly encouraged to enable a reduction of GBV and VAWC incidence of 50% by the year 2020.

### **2.19.2 Child Development**

There are a lot of disparities in Early Childhood Development (ECD) service provision in terms of access, quality and equity across the rural-urban contexts, with many of the most vulnerable children not able to access ECD services. Nationally, a few institutionalized ECD centers exist - 30 government pre-schools, 84 Madrasa ECD centers and 385 private pre-schools. The quality of infrastructure and play and learning resources varies within and across districts, and between urban and rural areas. 17 out of 21 ECD centers had adequate indoor play and learning materials, outdoor equipment for children is a challenge, thereby limiting children's development in some of the key domains. The target is to improve the quality of care that support development and welfare of the children and reduce percentage of orphans from 23.6% to 19% by 2020. Research priorities include a mapping of day care centers (numbers, location, human resource capacity, etc.) as well as an assessment of the quality of these centers.

### **2.19.3 Gender and Development**

Despite the responses in addressing gender inequality in Zanzibar, its prioritization and mainstreaming across sectors is still low. The proportion of women whose main activity is as housekeepers (housewives), but who have some other economic activity on the side, has dropped by a significant 6.6% percent between the surveys (from 8.1 percent to 1.5 percent). This indicates that a sizeable number of women have lost their sources of livelihood, and instead have been pushed into depending entirely on their spouses. MKUZA II has set a target of increasing women's participation in decision-making organs from 30% to 60% by 2020 as well as increasing employment of women in the government and private sectors from 5.2% and 2.4% to 10% and 5.5% respectively. Research in this area should therefore focus on analyzing the situation of women and identifying causes of gender inequality in Zanzibar.

### **2.19.4 Social Protection**

In Zanzibar there is in the area of social protection limited research that provides information on the status of social protection and the

impact it has had in reducing poverty. Statistics show that 44.4% of the population in Zanzibar lived below the basic needs poverty line while 13% lived below the food poverty line in 2010. Although there are steps to establish the Zanzibar Social Protection Policy, there is no quality data focused on social protection available that can inform programs and provide planners and implementers with baselines which would allow a meaningful impact evaluation of social protection programs. There is still a gap in mapping social protection interventions, resource mobilization and the capacity to deliver programs. MKUZA II set a target of improving the quality of life for vulnerable groups by reducing poverty from 44.4% to 30% by 2020, and increasing availability of quality data and information. Researchable topics in this area will include targeting, impact evaluation and government and non-government spending on social protection from a gender perspective.

### **2.19.5 Family Wellbeing**

Due to socio-cultural diversification and social change, families today experience various upsets to the social order - single-headed households, marital disruption and divorce (HBS 2010 indicates that the divorce rate was 6%), neglect and improper care of children and the elderly, child abuse, alcohol and drug abuse, high rates of out of wedlock births, juvenile crime and teen sexual activity. Data from the Child Protection Unit shows that more than 393 child maintenance cases are reported annually arising mainly from disintegrated families and irresponsible fathers. Research on how to understand this cultural diversification and its impact on family wellbeing is important in promoting stability and wellbeing of families. The target here is to reduce maintenance cases caused by disintegrated families and irresponsible fathers by 30% by the year 2020.

### **2.19.6 Youth, Gender and Participation**

Youth participation at different levels of decision-making is limited and many decisions concerning them are made on their behalf by others. No formal mechanism exists to facilitate youth to express their views and opinions at a national level. In particular,

the participation of young women in public life is limited. There is inadequate encouragement and opportunity for girls to participate due to cultural beliefs and the prevalence of a patriarchal system. Therefore the focus of research is to reduce the unemployment rate from 17.1% to 10% by 2020 and increase the number of youth in decision-making organs at different levels. In that regard the researchable areas should include youth empowerment and the gap in participation between young men and Women.

## **2.20 INFRASTRUCTURE**

Zanzibar's infrastructure has become increasingly run-down during the last decades and is already limiting further investment in the promising tourism sector. The objective of the government is to reduce vehicle operating and road maintenance costs and improve road transport services in Zanzibar as well as enhance management of the road networks by 2020. Current government efforts include construction of the new airport terminal to handle more passengers and large aircraft and upgrading of the road network to enhance accessibility and transportation around the islands.

From the national priority setting exercise and the ranking tools provided, the following are the ranked researchable areas:

- Infrastructural Planning
- Infrastructural Maintenance
- Disaster Management
- Infrastructure Construction
- Modernization of Infrastructural Equipment
- Infrastructure facilities, aid and general services to PwD
- Monitoring and Evaluation System

### **2.20.1 Infrastructural Planning**

Currently, the existing infrastructure in all transport sub-sectors (roads, seaports and airports) are poorly planned to meet the rapidly increasing demand of the developmental goals of the country. At the moment a lot of the transport infrastructure is overloaded due to poor planning. In road infrastructure, for example, most urban roads are missing important facilities such as walkways, pedestrian crossings and parking areas, and many new settlements are not directly linked

with the necessary road network to meet their growing needs. As a result there have been problems of road congestion, accidents and above all severe deterioration of the roads.

As by 2020 the target is to reduce road congestion and accidents by 50%, there is a need to study new planning techniques of road infrastructure to ensure road investment meets the existing and future road users needs.

### **2.20.2 Infrastructural Maintenance**

The state of most infrastructure (roads, seaports, airports) in Zanzibar leaves a lot to be desired. There are numerous cracks, patches and potholes on many roads; too narrow bridges that make some roads accident prone; lack of road signs in many areas and poor drainage systems. The national target is to have 90% of all roads in the islands upgraded to tarmac level by 2020. This will establish a modern road network and also tremendously reduce vehicle costs and the financial burden resulting from unexpected maintenance costs. Improved roads also mean better access to schools and hospitals, and markets for farmers, fishermen and business. On the other hand, Zanzibar seaports need to be upgraded and maintained in order to meet the needs of current and future demands. Research is needed to find alternative ways for improvement of road infrastructure maintenance with a view to minimizing the cost burden.

### **2.20.3 Disaster Management**

Zanzibar has had a variety of natural and man-made disasters recently, especially in marine transport. At the port for example, there is lack of rescue boats, helicopters and early warning systems. With a poor disaster management system generally, lack of resources, and conflicting responsibilities among different entities dealing with humanitarian aspects of emergencies, there have been many losses of lives and property when these accidents and natural disasters happened. For example, in 2005, Zanzibar experienced very high rainfall lasting 36 hours and measuring 149+ millimeters. The result was 10,000 households destroyed and over 10,000 livelihoods lost. At the port, there is lack of rescue boats,

helicopters and early warning systems. Disaster incidents have been an obstacle to sustainable development. There is no comprehensive study which exposes the risk areas, the potential hazards facing those areas, and the capacity of existing disaster management systems. Also there is no study to explain the increased settlement in hazardous areas causing inappropriate use of resources. This lack of information is a hindrance to effective prevention, mitigation, and recovery in disasters. Research in this area should thus aim to fill these knowledge gaps, and help reduce the vulnerability of Zanzibar's communities by creating mechanisms that will empower the communities to raise their income from 48% to at least 55%, thus decreasing their susceptibility to disasters. It would also aim at putting in place a proper disaster management system which can respond quicker, faster and effectively when a disaster happens.

#### **2.20.4 Infrastructure Construction**

Due to the rapid socio-economic development of the island, transport infrastructure has become increasingly inadequate. According to the 2012 population census, Zanzibar has about 1.3 million inhabitants, 46% of whom live in urban areas (Trend of Zanzibar Population Census and Projection 2012). The annual population growth rate is estimated at 2.8%, exerting a lot of pressure on the island's infrastructure, especially roads, airports and seaports, and sewage systems. There is an urgent need for the government to expand existing transport infrastructure in order to cope with growing demand.

By year 2020 the target is to expand town entry roads to double carriageways, improve rural roads to increase market access, upgrade the seaport and airport. Our research should aim to find appropriate methods of construction and also to assess the suitability of alternative materials of road construction.

#### **2.20.5 Modernization of Infrastructural Equipment**

Over the years the government has been pursuing efforts to modernize its seaports and airports in order to improve their performance to meet economic, social and technological changes.

However these facilities still use outdated handling equipment for both cargo and passengers. As a result there have been delays in cargo and passenger handling, damage to cargo and pilferage, causing a lot of inconvenience to both customs officers and passengers. Furthermore severe accidents have been reported at the seaport due to the use of outdated equipment (i.e. handling equipment, overhead cranes, hoist systems, spreader bars, lifting beams).

Our target is to modernize Zanzibar ports by constructing a new port and equipping the existing seaport with new and modern handling facilities for increased efficiency, productivity and safety. Therefore research is needed to examine traffic density in our ports, the efficiency and effectiveness of cargo and passenger handling equipment, marine pollution and environmental impact from construction of the new port.

#### **2.20.6 Infrastructure, Facilities, Aid and General Services to PwD**

The needs of disabled people are different from those of the able-bodied. Although more special facilities may be claimed for PwD, the right position would be equal access to all. The equality right includes a duty to take positive steps to ensure that the disabled benefit equally from services and opportunities offered to the general public. In principle, infrastructure, facilities and aids should be designed or redesigned in such a way as to facilitate access of all people. This underlines the fact that lack of proper facilities and infrastructure could be the greatest barrier for PwD to show their full potential in schools, working areas, sports or any community initiatives. Therefore, it is imperative to undertake a comprehensive assessment of physical structures, human resources, teaching and learning materials, communication media and methodologies, attitudes, traffic laws and disability, public pathways and buildings accessible for PwD as well as availability of facilities for PwD across public and private buildings.



### **2.20.7 Monitoring and Evaluation System**

Monitoring and Evaluation is important in the transport infrastructure sector. Monitoring is technically defined as systematically checking or scrutinizing something for the purpose of collecting specified categories of data. An M & E system helps to determine whether a project was implemented correctly (implementation or compliance monitoring). It is also an important part of understanding why a project may or may not have achieved its intended goals and objectives. Implementation of M & E is relatively straightforward, involving quality assurance and project construction management, and may be as simple as a yes-no checklist. In Zanzibar there is no efficient and effective monitoring system, which causes many challenges in project implementation. Research is needed to find out the effective and efficient ways of M & E which can reduce failure of projects. By 2020, the target is to put in place proper M & E systems capable of tracking ongoing and past projects.

### **2.21 TRANSPORT**

The transport sector plays a vital role, but it also has many shortcomings. The bus terminals are few, the roads are narrow, and the bus routes are poorly coordinated.. Similar problems face marine and air Transport, so that congestion and accidents seem unavoidable. Consequently, following the national priority setting exercise and the ranking tools provided, below are the ranked researchable areas:

- Traffic Accidents
- Law and Regulation in Transport
- Transport and Traffic Management System
- Ports Productivity
- Traditional Transport System
- Weather and Climate Change in Transport and Communication

#### **2.21.1 Traffic Accidents**

The Transport Sector is facing many challenges, one of which is the rising number of road accidents. According to recent statistics, in 2012 there were 786 road accidents reported, 6 maritime accidents

and one aircraft accident between 2009 and 2013. Road accidents are excessively high, resulting in great human and material loss. . Therefore ways have to be found to reduce the number of accidents and also to mitigate the impact for those that might happen. The aim is to reduce road accidents from 786 in 2012 to 200 in 2020. Our research should focus on examining factors affecting road accidents and also to explore their impacts.

### **2.21.2 Law and Regulation in Transport**

Currently, the transport sector in Zanzibar is governed by various laws and regulations. However these laws are experiencing poor enforcement, lack of public awareness and obsolescence.. This has caused poor regulation of the transport sector which has in turn resulted in problems such as accidents and wasteful competition. Such problems can only be addressed by an improved legal regime. Research is needed to examine the adequacy of the existing legal regime in the transport sector and to explore the enforcement mechanism of transport legislation.

### **2.21.3 Transport and Traffic Management System**

In recent years there has been an increase in the number of vehicles, motorcycles and pedestrians on Zanzibar roads. According to the department of transport and licenses the number of vehicles has increased from 754 in 2010 to 2,022 in 2012, an almost triple rise. The greater traffic volume puts pressure on the urban road network which has long been under capacity due to reckless parking of vehicles on road pavements, lack of sidewalks for pedestrians and cyclists, and petty traders choking the roadsides. This has resulted in frequent incidents of traffic congestion and accidents on Zanzibar roads.

To address such problems, several measures to manage road traffic in Zanzibar have been developed, one of which is the establishment of traffic-free zones in some Stone Town areas as proposed by the Transport Policy. However research is needed not only on the advantages of traffic-free zones but also on traffic control measures, mechanisms for road traffic management systems, and impacts of congestion.

#### **2.21.4 Ports Productivity**

There are 5 ports in Zanzibar, two in Unguja and three Pemba. The main port at Malindi was built in 1925 as a modest lighter port. Now the port handles more than 90% of Zanzibar trade, but it is in a poor state in terms of infrastructure (quays, container stacking yard etc) and is also very limited in operation and storage facilities.

The challenge is to have efficient ports that ensure safe handling of cargo and passengers, adequate space for container handling and storage, enough cargo handling gear and berth space to accommodate traffic. There are also required separate cargo and passenger terminals. By 2020, the aim is to increase the port's annual productivity to 60,000 containers and 2.5 million passengers. Research should therefore explore the factors affecting port productivity for enhanced performance.

#### **2.21.5 Traditional Transport System**

Traditional transport is mainly of two kinds, cow and donkey carts in the rural areas, and bicycles in both rural and urban areas. Both contribute to road accidents, since they have to share the roads with cars and motor cycles. There are no special lanes for carts and bicycles.

There is a need of research on the contribution of traditional transport to road accidents, and on how traditional transport can be accommodated.

#### **2.21.6 Weather and Climate Change in Transport and Communication**

Climate and weather are very important in our daily life and have a direct impact on transport and communication. Zanzibar has four metrological stations, three of them have personnel and one is self-driven for weather and data observation.

The predicted rise in sea levels and the associated increase in frequency and intensity of extreme weather events such as heavy rain, storm surges and flooding incidents may be some of the most worrying consequences of climate change, especially for coastal

areas like Zanzibar. Climate change-related shifts in weather patterns might also cause transport and infrastructure disruptions. This can be controlled by conducting detailed research on the impact of weather and climate change on transport and communication, and also the role of weather information in maritime safety. From the research, policy makers can be informed on how transport and communication infrastructure should be developed to best handle future climate change and weather events. There is a need to increase weather and climate observation network (stations) in Zanzibar from 4 stations to at least 7 stations by year 2020.

## **2.22 COMMUNICATION**

The Government of Zanzibar, realizing the importance of Information and Communication Technology has introduced special departments concerning ICT - the department of ICT and the department of E-Government. The installation of the national fiber optic backbone intends to improve performance within the Government generally and in e-government in particular. Despite these rapid improvements, Zanzibar's communication environment is still wanting. -Communication networks are concentrated in urban areas with little deployment or access in rural areas. Currently, only 25% of all educational institutions have computer laboratories and other multi-media facilities and these are more prevalent in private educational institutions than in public ones. Given this situation, the following research areas are priority for the communication sector according to MKUZA II.

These are also based on the national priority setting exercise and the ranking tools provided.

- Information and Communication Technologies (ICT)
- Knowledge and Expertise
- Law and Regulations on Communication
- Analogue and Digital Systems
- Mass Communication
- Broadband Services in Zanzibar

### **2.22.1 Information and Communication Technology**

Zanzibar has made remarkable strides in deploying ICT. Currently the Government plays a model role in using ICT in her daily business processes with a view to improving service delivery and efficiency, making the Government more result oriented and citizen centered. In spite of this, ICT infrastructure is poor and characterized by unreliable networks and high cost services; there are no standards to measure the imports of both hardware and software against; and there is a lack of e-waste management.

There is a low capacity for local software development, where most of the software used by both public and private sectors is imported. In general, Zanzibar has an emerging skill capacity of about 10%, to support the ICT industry in terms of developing, using, selling or supporting hardware and software. There is also low ICT knowledge among policy makers, politicians, business communities and the public in general.

Our target is to increase the awareness, usage and support on ICT technology in Zanzibar. In order to create an enabling environment for ICT development, research should aim to study local capacity of ICT infrastructure development, to examine quality assurance of ICT products, and to assess awareness and usage of ICT.

### **2.22.2 Knowledge and Expertise**

According to recent research conducted on Zanzibar, more than 75% of Zanzibar's population lack the basic knowledge of using ICT, particularly computers. Additionally there is a shortage of qualified ICT personnel, lack of proper and unified certification and accreditation of ICT professional system, and inappropriate development of qualified ICT personnel.

The main target is to increase ICT knowledge in the population to reach at least 50% by the end of year 2020. Therefore, research should aim at assessing government capacity in ICT usage, studying certification and accreditation systems of ICT education, and ICT curriculum development.

### **2.22.3 Law and Regulation on Communication**

At the moment there are no existing laws and regulations that cater for the whole spectrum of ICT application in business, innovation and other socio-economic areas. Consequently, people use ICT services with no data and privacy protection, child rights are not protected, fraud and crime in ICT operations are not covered, and wasteful competition in ICT is not controlled. Additionally there is no law regulating e-business operations, something which led many businessmen to lose confidence and trust in ICT.

The aim is to reduce cyber crime activities by 75% in 2020. Research therefore needs to study data access rights, privacy protection, computer fraud and crime, and security and privacy of e-transactions.

### **2.22.4 Analog and Digital Systems**

The digitalization of content has allowed it to be offered on any device, network or platform. The main challenge has been to align policy and legislation to ease the migration to digital broadcasting in terms of investments in technology, and consumer awareness. By 2020, the service providers should specialize more in content creation, distribution, transmission, delivery and provision of support services for subscription management. The research needs to determine the effectiveness of policy and legislation in implementation of the digital system.

### **2.22.5 Mass Communication**

Mass communication is usually understood to relate to newspapers, magazines, and book publishing, as well as radio, television and film, as these media are used for disseminating information, news and advertising. Zanzibar seemed to move towards adopting the current trends of communication, but the emergence of new media such as SMS, BBM as well as WhatsApp has made it difficult to control both the provider and the users. Therefore, research is needed to determine how the content of mass communication persuades or otherwise affects the behavior, attitudes, opinions, or emotions of people.

### **2.22.6 Broadband Services in Zanzibar**

Telecommunication companies launched 3G network providing fast access to communication services such as the internet. With the liberalization of the broadcasting sector in Zanzibar and the enactment of the Zanzibar Broadcasting Commission Act No. 7 of 1997, broadcasting operators spread over a vast area nationally and even regionally while others cover smaller localities. Zanzibar Broadcasting Corporation (ZBC) remains the main public broadcaster providing terrestrial television and radio services. There are two privately owned cable television companies, one in Unguja town and the other in Chake Chake Pemba. Also, there is one Digital Terrestrial Television company offering services in Unguja.

However, the existing communication infrastructure development is characterized by unreliable networks, limited coverage in some areas, proprietary issues (incompatibility of some communication components across different service providers), and use of obsolete technologies. Moreover, unreliable power supply compromises the affordability and accessibility of quality communication. The target by 2020 is to increase the coverage of communication transmissions by 20%. Illustrative research areas include communities' perceptions of digital and analog communication systems as well as innovative solutions to network unreliability.

## **2.23 EVIDENCE BASED POLICIES, HUMAN RESOURCE DEVELOPMENT AND INTERNATIONAL AFFAIRS**

### **2.23.2 Government Policies**

The Zanzibar Government has introduced research departments in all sectoral ministries. Most existing policies are not motivated by research. Therefore, the implementation of Government policies in Zanzibar is not as efficient as would be desired. There is thus a critical need of research on factors affecting formulation and implementation of Government policies. It is the target to improve service delivery to all people by 2020.

### **2.23.4 Government Performance**

The Revolutionary Government of Zanzibar has put in place an open

dialogue program to assess ministerial performance on their annual planned activities. Many reports presented by MDAs to the dialogue which is chaired by the President of Zanzibar each quarter show that there is good performance in implementation of activities planned by MDAs. Though the government has increased the budget of MDAs every year to improve services, there are still complaints about the services provided by some MDAs. Given this fact, research will give direction on how best to conduct assessment processes in line with the realization of broader Government objectives as highlighted in all national development documents.

### **2.23.5 Efficiency in the Delivery of Quality Services**

There are shortcomings in the government offices' performance associated with availability of resources and in particular human capacity, productivity tools and office spaces. In addressing this problem research would aim to identify the reasons for low performance and the conditions necessary for curbing this situation. An example of a research focus is assessment of skills capacity gap based on value chain analysis. The target in this area is for performance and efficiency in service delivery of the Government to improve by the year 2020.

### **2.23.6 The Zanzibar Diaspora and Socio-Economic Development**

The Government has recognized and acknowledged the importance of Zanzibar's Diaspora in socio-economic development. The education and health sectors have started to benefit from Diaspora contributions. However, their exact numbers, areas of concentration, professions as well as monetary and non monetary contribution to their home land have to be revealed through research.

Equally important is a specific study to identify the challenges which impede the Diaspora contributions to Zanzibar and opportunities availed to them. The target is to improve Zanzibar development through Diaspora contributions by 2020.

### **2.23.7 Exploration of Markets in the EAC and SADC**

The reports from meetings of the East African Community and



Southern Africa Development Community suggest that these markets have not been adequately explored for the benefit of the business community of Zanzibar and the country in general.

These trends call for the need for research that will identify particular opportunities in these markets. The markets are huge and the demand for goods and services is great. The target is to penetrate these markets and thus to increase exports of goods to the markets by 2020.

## **CONCLUSION**

Research plays a key role on national planning processes and implementation of developmental strategies such as poverty reduction plan and Vision 2020. Evidence-based planning and decisions require authentic research data. This report provides an outline of the priority research areas in Zanzibar which is crucial for informing decision makers.

The Research priorities were developed with a broad participation from all sectors across the Revolutionary Government of Zanzibar as well as non state actors. Research areas and topics were identified based on the present societal and institutional challenges. The areas were linked with Zanzibar Poverty Reduction Strategies (MKUZA), Vision 2020 and other National developmental documents.

The priorities will contribute to redress the social and economic development challenges using research evidences. In addition, this research agenda will establish a clear mechanisms for the design, submission, appraisal, monitoring and dissemination of research carried out under the framework of this research agenda.

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## **ANNEX 1**

### Workshops for Identification and Validation of Researchable Priority Areas

<b>Workshop</b>	<b>Sectors</b>	<b>Sub-sectors</b>	<b>Dates</b>
1.	Productive sectors	<ul style="list-style-type: none"><li>▪ Agriculture</li><li>▪ Environment and climate change</li><li>▪ Food security and livelihoods</li></ul>	28th– 30th May 2013

- Fisheries

- Livestock

## 2. Social services I

17th– 19th June 2013

- Energy

- Health

- Water and sanitation

- Human settlements

3.	Social services II	<ul style="list-style-type: none"> <li>▪ Education</li> <li>▪ Sports</li> <li>▪ Tourism</li> <li>▪ Culture and historical heritage</li> <li>▪ Information</li> </ul>	20th–22nd June, 2013
4.	Economy and Governance	<ul style="list-style-type: none"> <li>▪ Labor and employment</li> <li>▪ Macro-economy and</li> </ul>	2nd–4th July, 2013



financial management

- Gender
- Private sector, business environment and Private Public Partnership (PPP)

- Participatory Democratic

governance

- |    |  |               |                    |
|----|--|---------------|--------------------|
| 5. | President's Research<br>Committee<br><br>for Natural Resources | ▪ All sectors | 23rd January 2014  |
| 6. | Directors of Planning,<br>Policy and Research                  | ▪ All sectors | 18th February 2014 |
| 7. | Inter-ministerial Technical<br>Committee                       | ▪ All sectors | 17th April 2014    |



