Foreword

The survival of the society depends directly or indirectly on environmental resources. However, one key environmental challenge facing the world today is rapid rate of urbanization that threats the urban environment. Some of outcomes of urbanization experienced in Sumbawanga Municipal council are;- Increased atmospheric temperature ,toxic waste, water and air pollution , land degradation , Biodiversity loss. These challenges need to be address wisely to place future human development on sustainable path. In order to address them, there is a salient need to investigate the linkage between population growth, consumption and the state of the environment in general Urban Local Government Strengthening programe (ULGSP). It translates the ULGSP into an applicable national framework in Tanzania. The ULGSP is a development paradigm which shifts fundamentally from the technology drivers and resources focused traditional development mode and built on the basic premises outlined here in after.

- Sustainable cities are fundamental to social and economic development and they are engines of growth.
- Environmental degradations adversely effects economic efficiency and equity and hence obstruct the development contribution of cities.
- Environmental degradation is not inevitable. A proactive management approach is required to build on the understanding of the complex interactions between development and environment.

This is the 2nd edition of the Sumbawanga Municipal Environmental Profile (SMEP) based on Environmental Planning and Management (EPM) framework. The first SMEP was formally promoted by the Sustainable City Programme (SCP) in the year 2006- 2007 with the preparation of the first edition in 2008, and identifying priority issues on environmental management. The Urban Local Government Support Programme (ULGSP) started in the year 2011/12 is currently in operation after the SCP, and expected to accomplish in 2018/19 financial year . It is operating in 18 urban LGAs including the Sumbawanga Municipal Council. Its focus also gives priority to Environmental and Social issues in urban areas to be effectively addressed while dealing with the urban development. It is a programme oriented to various development stakeholders to negotiate on strategies to required goal and seek collective solutions for issues of priority and common concerned. It consists of and interactive set of logically sequenced activities of implementations and confusions resulting from resource conflicting activities into existing institutions, then will lead to considerable changes in the way development issues are perceived and addressed.

This profile is a product of efforts of key stakeholders from different private and public sectors. The stakeholders have jointly identified the burning environmental development issues throughout the Municipality through a consultative process. The objectives of this profile are;

- To provide baseline information on activity sectors, the environmental setting and management arrangement.
- To highlight the interactive issues between development and the environment, and between different activity sectors. The interactions are those triggered through by competing used of natural resources or which manifest themselves via the primary and secondary feedbacks from natural resulting sector activities.

This profile will be updated regularly, it is a compilations and synthesis of existing data and knowledgeable focused on management factors of environmental development. It forms a baseline and a common information base onto new information will be added when it become available.

The completion of this environmental profile as a baseline information pool marks the start of a sequence of minor and major consultations among the stakeholders of key sectors. This will convene deliberate and agree on the priority issues of the environment and development in Sumbawanga Municipal. We believe that, this profile will inspire, stimulate and promote a mutual understanding among all stakeholders in the process of systematic identification and clarifications of the interactions between issues of environmental and development. In addition, it will provide a deeper understanding of the complexity of the Municipal environmental problems of common concerned, and the ways and means of solving them.

……
William Zakaria Shimwela
Sumbawanga Municipal Director

August, 2014

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3. Rukwa Meteological Department
4. Tanzania Telecommunication Company Limited (TTCL)-Rukwa branch
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Acronyms

AIDS	Acquired Immunal Deficiency Syndrome
BAKWATA	Baraza la kiislamu Tanzania
BEP	Baseline Environmental Profile
CRDB	Cooperative Rural Development Bank
GTZ	Government of Tanzania
HIMA –PAMIRU	Hifadhi Mazingira -Panda Miti Rukwa'
HIV	Human Immunal Virus
KAESO	Kaengesa Environmental Society
LGA	Local Government Authority
LGRP	Local Government Reform Programme
NBC	National Bank of Commerce
NBS	National Bureau of Statistics
NGO	Non Governmental Organization
NMB	National Microfinance Bank
PEDP	Primary Education Development Plan
PPP	Public Private Partnership
REMSO	Rukwa Environmental Conservation Society
REYO	Rukwa Environmental Youth Organization
RFA	Region Facilitating Agency
RUAECO	Rukwa Agricultural and Environmental Conservation
SEDP	Secondary Education Development Plan
SIDO	Small Industrial Development Organization
SMEP	Sumbawanga Municipal Environmental Profile
SUWASA	Sumbawanga Urban Water Supply and Sanitation Authority
TANESCO	Tanzania Electrical Supply Company
TANESCO	Tanzania Electrical Supply Company
TAZARA	Tanzania-Zambia Railway line
TPC	Tanzania Postal Corporations
TTCL	Tanzania Telecommunication Company Limited
NIC	National Insurance Cooperation
NSSF	National Insurance Corporation National Social Security Fund
Km	Kilometer
Ha	Hectare
ULGSP:	Urban Local Government Strengthening Programme
SCP:	Sustainable City Programme
SMEP:	Sumbawanga Municipal Environmental Profile

Vision and Mission Statements of the Sumbawanga Municipal Council

Vision

Sumbawanga Municipal Council aspires to be highly competent Local Authority in terms of its ability to provide quality socio-economic services sustainably.

Mission

Sumbawanga Municipal Council is committed to utilize effectively and efficiently available potential resources to continuously provide quality socio-economic services maintenance of peace, and order through participation of different stakeholders in order improve living standard of its community and bring about sustainable development.

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CHAPTER ONE
THE MUNICIPAL DESCRIPTION

1.0 Introduction

Sumbawanga Municipal Council was established in 1984 after a series of landmarks that led to the enacting of Local government Act No. 8 (Urban Authorities) of 1982. It is one of the four councils comprising the Rukwa region.

The Sumbawanga Municipal Council is among the 18 councils under phase one of the ULGSP which started in 2010. The major goal of the reform programme is to enhance the level of performance of Local Government and improving social services delivery in five sectors namely Education, Health, Water, agriculture and works. Among these Environmental care being a cross cutting agenda so as to promote sustainable development. Sumbawanga Municipal Council profile provides information on the basic data of the Municipality in the said areas.

1.1 Geography of the Municipal

1.1.1 Location and size

Sumbawanga Municipal Council is one of the four councils forming Rukwa Region. Others include Sumbawanga District Council, Kalambo District Council and Nkasi District Council. The Sumbawanga Municipality lies between latitude $07^0$48' to $08^0$31' South of Equator and longitude $30^0$29' to $31^0$49' East. is found in South- West Tanzania, in Southern Highlands of Ufipa, (figure 1). The Municipal covers an area of 1329 $Km^{2.}$

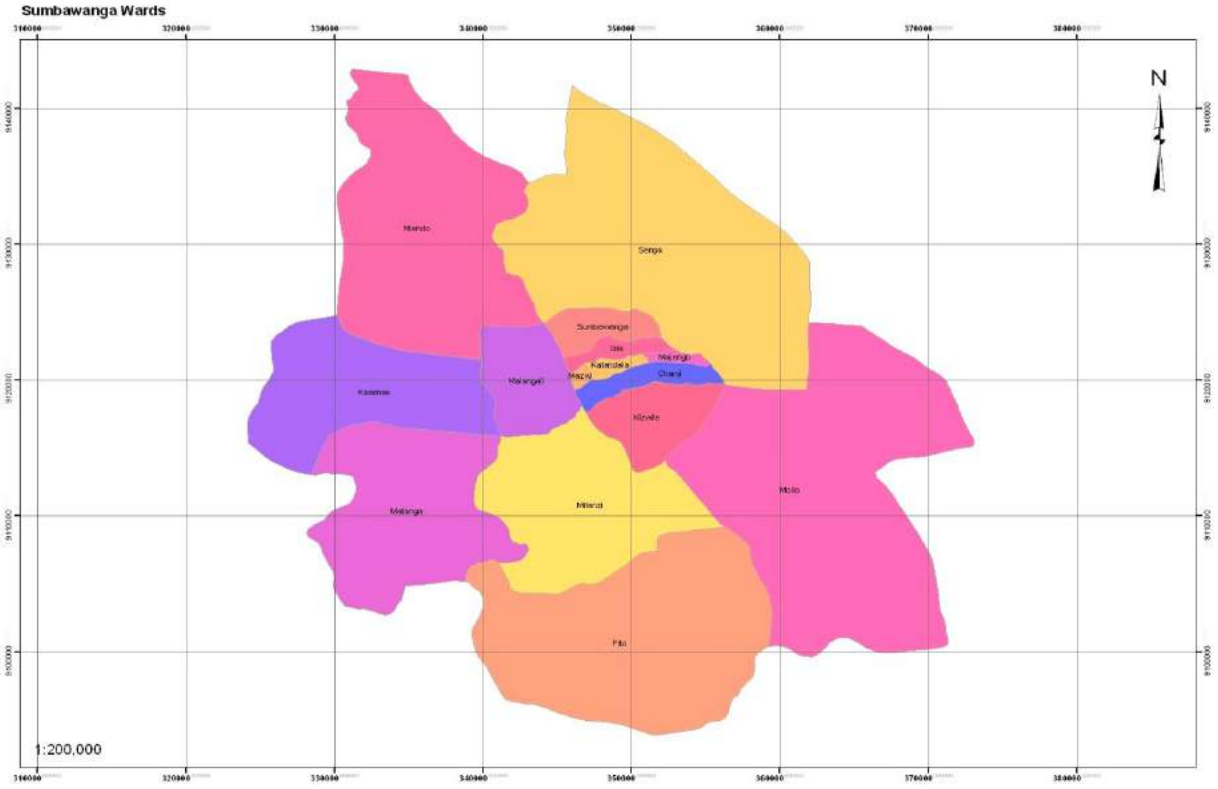


Figure 1: *Sumbawanga Municipal Administrative boundaries. (**Source:** Sumbawanga Municipal Council, 2014)*

1.1.2 Geology

The granite intrusion and volcanic extrusion are widespread on the Western part of the Municipality. Karoo rocks are found to the West of River Lwiche, they contain small quantity of low graze coal. These rock outcrops tend to flow a south West North West course like that of the flow of river Lwiche and that of Rift Valley.

1.1.3 Topography and soil

Sumbawanga Municipality lies on the western arm of the Great East African Rift Valley. It has an average altitude of 1700 metres above sea level. The highest altitude of 2461 metres is Malonje, 24 Km southeast of Sumbawanga Municipality. The area is also characterized by prominent hills. On the northern part is Ufipa plateau with an average height of 1700 meters. The escarpment of *Lyamba lya Mfipa* lies to the north of the Municipality, and forms the northern boundary of Sumbawanga Municipality with the Sumbawanga District Council and Nkasi District. There are landforms such as plains, hills, swamps, and extensive lowlands. The later, are drained by surface water for at least half part of the year. Areas are of gently undulating terrain with average slopes of less than 7.1%, rock outcrop may also occur.

A basic subdivision can be made between erosion and deposition plains, while the former have been developed from a wearing away of the land, the later have been built up through the deposition of weathered material eroded from the former. There are also dominants of ant hills commonly used for brick-making and building soils. There are hilly mountains with steep slopes reaching as high as 31%, sparsely distributed in various parts within the municipality. These include Nyengele, Kapata, and Milanzi, measuring at a height of 2299m above sea level, located in the western part of the Municipality, Fala Hill, located close to the Mtimbwa Village, Kalangasa near Milanzi, Malonje near Ulinji Village, Mzimwe and Namchinga adjacent to Tamasenga Village. The rest of the municipality is flat grassland normally known as 'mbuga'.

The Municipal is traversed by a number of rivers and streams, some are permanent and others are seasonal. These include Lwiche, Chanji, Manzitiswe and Kaswepepe. The Municipal and its surroundings are characterized by sesquioxide keolinoid, which are highly leached old soils resembling the later zed red soils. Where the ground water table is low, the parent rock gives rise to freely drained sandy textured soils. Generally, the soils are of well drained and sandy in texture in most areas. Clay soils are associated with anthills. Loam soils are found along the valleys, rivers and streams.

1.1.4 Climate

The municipal is characterized by dry sub-humid climate for most part of the year. The average temperature is 27 ^{0} C. It is cool, dry, and often windy from May to October, the coolest months are June and July when the temperature is as low as 16^{0}C and even 5^{0}C. The Municipality gets moderate rainfall; 900 mm to 1000 mm per year, (an average of 946.8 mm), beginning in early November to approximately late April. The rains are usually accompanied with lightning and thunderstorm

1.1.5 Vegetation

The vegetation in the Municipal mostly comprises of grassland and bushes. Woodlands occupy on hill slopes and tops.

1.1.6 Population and Human Influence

According to 2002 Population and Housing Census, Sumbawanga Municipality had a population of 146,842 people, out of which 71,176 were males and 75,666 females. The Municipal proper had 64,325 and the rural area had 82,517 people. However, the population growth has increased as high as 42.9% at a period of 10 years. According to 2012 Household Census, the Sumbawangan Municipal Council had a total Population of 209,793 where 100,734 are Male equal to 48%, and 109,059 are Female holding 52% of the total population.

An average household size is found to be 4.8 people according to the 2012 National Bureau of Statistics (NBS) Census results. However, males seem to hold a little lower percent of 48 leaving female occupying 52 percent of the family size in average. Mazwi ward is found to hold the lowest (3%) of Municipal population and family size ratio having 6,197 and 4.1 respectively, while Chanji ward contributes 11.5 percent of the total municipal population having 24,184 people. The highest family size household is observed at Senga ward. Table 1 below describes in details.

Table 1: Population distribution among SMC administrative wards

S.N	Ward	Total population	Percentage to total population	Male	Female	Average family size
2	Mazwi	6,197	2.95	2,907	3,290	4.1
1	Malangali	6,743	3.20	3,270	3,473	4.6
8	Senga	6,793	3.22	3,430	3,363	5.4
12	Matanga	9,521	4.53	4,701	4,820	5.3
13	Kasense	11,201	5.34	5,411	5,790	5.1
4	Katandala	12,685	6.04	5,937	6,748	4.2
7	Ntendo	13,324	6.35	6,525	6,799	5.3
11	Milanzi	13,482	6.41	6,588	6,894	5.2
14	Majengo	15,447	7.36	7,394	8,053	4.7
10	Pito	15,561	7.42	7,495	8,066	5.2
9	Mollo	15,707	7.48	7,640	8,067	5.2
6	Kizwite	16,187	7.71	7,662	8,525	4.7
3	Izia	19,463	9.29	9,064	10,399	4.5
5	Old Sumbawanga	23,298	11.11	11,128	12,170	4.7
15	Chanji	24,184	11.50	11,582	12,602	4.7
	Total	**209,793**	**100.00**	**100,734**	**109,059**	**4.8**

Source: National Bureau of Statistics, 2012

1.2 Historical Development

The history of Sumbawanga Municipality can be traced as far back as 1914 when the natives knew the name of the place as Sumbawanga. By 1929 the name of the settlement was adopted as an administration capital of the then Native African authority. In 1950 the UFIPA District Council was installed.

By 1982 the town was designated a Township, by Act No. 8 of Local Government Authorities. It had a population of 61,223 residents by then. As from 30/10/2005 the township was upgraded to the Municipality status along with its 25 registered villages.

Accessibility to the Municipality is by use of Sumbawanga – Tunduma road, Sumbawanga – Mpanda road and Sumbawanga – Kasesya road. Kasesya is a border town in North – Eastern Zambia. The three roads –links are currently under the big upgrading projects from gravel to tarmac expected to be through by end of 2017 year. The air link between Sumbawanga Municipality and the rest of the country is at a very rudimentary stage, there is only a small airport that caters for small airplanes only.

Railway accesses are found at adjacent towns; The (TAZARA) railway line found at Tunduma Township located 240 km to the southeast along the Dar es Salaam – Kapiri-Mposhi International Railway Access, and the Tanzania Railways Authority (TRL) railway access at Mpanda Township, 240km to the west linked to the Dar es Salaam-Kigoma Central Railway line branching southward at Kaliua township in Tabora region.

1.3 Population Characteristics of the Sumbawanga Municipal

1.3.1 Birth Rate and Maternal Mortality

According to the NBS statistics, the 2002 population for the Sumbawanga Municipal was 147,483. The current population according to 2012 census was 209,793 with an increase of 62, 310 equals to 42.2%. The crude birth rate in Sumbawanga Municipal is 15/1000. Infant mortality rate 150/1000 and that of children under five is only 5/1000. The Maternal mortality rate is 258/100,000. Family planning acceptance rate is only 45%. According to TBS census results, the Municipal annual population growth rate is found to be 3.2%. The infant mortality rate was larger than the national average of 115 in 2007? The women of child bearing age 15-45 were 36,555.

1.3.2 Ethnic and Religious Composition

The racial and ethnic composition of Sumbawanga Municipal Council is diverse, largely due to immigration. The majority of the people are native Africans. Minority races are Arabs, Europeans and Indians. Among the native Africa, the predominant ethnics group is Fipa. Others are the Sukuma, Kandasi, Mambwe, Nyamwangwa, Lungu and nyika. Other ethnic groups are people from neighboring region including; - Mwanza, Mbeya, Kigoma and others from Rwanda and Zambia.

1.3.3 *Migration*

The growth urbanization in the Municipal is largely attributed to rural –urban migration. The determining factor is disparities between Sumbawanga Municipal township and other urban centre's in Rukwa Region

1.3.4 Population projection

The population of the Municipality stands at 209,793 people for the year 2012 at average family size of 4.8%. The population growth has been projected according to the 2002/2012 occurrence of average growth rate of 3.2%. the predicted population for other ten years are projected to from 2012 to 2022. However, the current projection are not yet in the dissemination to LGAs from the National Bureau of Statistics (NBS).

Sumbawanga Municipal council will remain to be the headquarters, institutional, administrative and commercial hub of Rukwa region. The growth and development of Sumbawanga Municipal Council depends on the involvement and collaboration of stakeholders, it is public, private, community based organization and faith based organization. The government cannot plan and execute them single handedly. There seem to be a deliberate introduction of special economic investments to create job opportunities. Examples of these are new or more sophisticated manufacturing, processing and service industries within the Municipality.

1.4 Gender and Community Development

Gender means socially ascribed roles of men and women in development. These roles are interchangeable. However, there are roles which are biological and limited to members of certain sex and cannot be changed by society. These include childbearing and breastfeeding.

There is widespread marginalization of women in Tanzania society. There are considerable efforts to uplift their status. Thus there is a misconception that gender development is women empowerment. This is simply not this case.

Gender development is related to several factors influencing development. These include literacy and education, culture, economic activities, political and legal aspect. Therefore, gender development can be discussed in abroad spectrum. Few of the influencing *development* factors provide highlight in the way we are trying to balance gender as explained hereinafter.

1.5 HIV/AIDS Interventions

HIV/AIDS is a calamity spread all over the country and its impact experienced in the society. Rukwa is one of the regions severely affected by the disease. It has 6% of the effects in its society, ranking at the 6th in Tanzania Mainland. There are 11 VCT to monitor HIV/AIDS infections in the region including Katandala, Dr Hartman hospital, Rukwa Regional Hospital, Mazwi Health center to mention few. A number of people have been volunteering to screen for HIV infections. One of the ways HIV is transmitted is through pregnant mother to children, blood transfusion and sexual interactions. Out of 2,962 pregnant women who visited antenatal clinics between 2008 and 2013, 312 of them equals to 11% were identified positive.

Municipal council, in collaboration with Region Facilitating Agency (RFA) called GTZ has implemented various intervention measures to control the spread of HIV. These include;- Provision of health education, identifying and supporting orphans vulnerable children of AIDS victims and providing assistance to window of AIDS victims. Others are sensitization programmes using audio visual aids and the construction of youth sports training centers to keep youth preoccupied and minimize AIDS infections.

1.6 Children Labour

The Tanzania constitution human rights section 15 (6) of 1984 defined a children as anybody under 18 years of age. Child labour is the employment of children under 18, and is illegal. Children may fall victim to overwork and heavy duty activities if employed. In the Municipality, child labour is exercised in different institutions. Table 2 the status of child labor in the municipality.

Table 2: Distribution of child labor in various institutions

Institution	Impact
Domestic work	Accident, Health hazards
Animal feeding/ cattle grazing	Exploitation and harassment, accident, health hazards and starvation
Information business	Accidents, starvation and exploitation

Source: SMC, Community Development Unit, 2014.

1.7 Social and Economic Infrastructure

1.7.1 Transport and Accessibility

Accessibility to the Municipality is by use of Sumbawanga – Tunduma road, Sumbawanga – Mpanda road and Sumbawanga – Kasesya road. Kasesya is a border town in North – Eastern Zambia. The three roads –links are currently under the big upgrading projects from gravel to tarmac expected to be through by end of 2017 year. The air link between Sumbawanga Municipality and the rest of the country is at a very rudimentary stage, there is only a small airport that caters for small airplanes only.

Railway accesses is found at adjacent towns; These are Tanzania-Zambia Railway line (TAZARA) found at Tunduma Township located 240 km to the southeast along the Dar es Salaam – Kapiri-Mposhi International Railway access, and the Tanzania Railways Authority (TRL) railway access at Mpanda Township, 240km to the west linked to the Dar es Salaam-Kigoma Central Railway line branching southward at Kaliua township in Tabora region.

1.7.2 Power Supply

Sumbawanga Municipal is not connected to the National power grid. The energy sources of power used is from Zambia and power generators both produce 8 Mega Watt. There are plans to produce electricity from other sources. For example, Kalambo waterfalls (found in Kalambo district), Nzovwe and Mfinga mini falls (found in Sumbawanga Rural) in the future government plans.

1.7.3 Postal and Communication Services

There is a post office with some telecommunication facilities in Municipality. It has 500 post boxes. There are 324 requests for boxes on waiting list. In sample of 5.5% of households in 2012 survey only 11% of them in the urban proper used post boxes rented personally for mail delivery.

Telecommunication system in the municipality is fairly adequate. Recently there has been a lot of improvement in this sector. Communication companies like TTCL has been in operation for a long time in the Sumbawanga Municipality. Moreover, cellular phone networks have been introduced by Vodacom, Airtel, Zantel and Tigo companies to serve communication in the municipality. Therefore there has been an increase in the number of handset users and consequently TTCL has lost part of her customers. Postal services, radio call, Radio station (chemchem FM) and telefax services are also available. Internet service cafes are on increasing feature in the Municipality.

1.7.4 Water supply

1.7.4.1: Urban water supply

Rural and urban areas of the Municipal residents face the problem of inadequate clean and safe water. During the dry season in urban proper, water supply is approximated to 1,500 m^3 per day, while during rainfall raises to approximately 3,000 $m^{3,}$ while the actual water supply requirement is 10,000 m^3 . The main sources of water are;- Mbizi catchments comprising several stream sources. Others are Lwiche, Ndua and Malangali water streams.

Water distribution pipe network serves about 100,545 (63%) of Municipal residents in urban proper under Sumbawanga Urban Water Supply and Sanitation Authority (SUWASA), and is expected to rise up after the accomplishment of the ongoing clean water supply network project.

1.7.4.2: Rural water supply

Rural water supply services are directly provided by the Sumbawanga Municipal Council through its water services unit. The areas included under the service are Pito, Mollo, Matanga, Kasense, Ntendo, Senga and some areas of Majengo wards. This service serves the rural Municipal resident population.

1.7.5 *Drainage and Sanitation*

Drainage and Sanitation networks are at a limited service in the Municipality. The observed drainage systems are at the road sides aimed to serve surface runoffs observed on street roads. However, many of the roads are not constructed with ditches and some do have ditches only on one edge of the road. Improper functioning of the constructed ditches cause surface water to destroy the road infrastructures. Sanitation facilities in the Municipality do still depend on household septic tanks and emptier trucks. Currently, the municipal residents depend only on the available two emptier trucks, one for the Municipal council and the other owned by private stakeholder (Mwandele Investment).

1.8 Economic Activities and Employment

1.8.1 Public and Private Employment Sectors

The Municipal has a few primary industries that process locally produced raw material. They employ 11,719 people in both formal and informal sector. This is about 57.1% of workforce in the Municipal. Eighty five percent of Municipal working age group (18-60) years were engaged in agriculture as their main economic activity.

The public sectors are the central government, municipal authority and public institutions. Specific examples of the public sector are parastotal, in which there are; Meteorology unit, SIDO, Tanzania Posts Corporation, Tanzania Telecommunication company Limited and National Insurance Corporation. Other are financial institutions which are CRDB, NBC, NMB, PRIDE Tanzania, there are 12 NGO's that involves with environmental issues. Other, formal private sector includes; - the Rukwa Chamber of Commerce, private hospitals (1), Private fuel stations (9). Private voluntary organization are religion oriented are;- Roman Catholic, Christian of Tanzania Churches- Pentecostal, Tanzania Evangelistic, Assembly of God and Seventh Day Adventist and BAKWATA

1.8.2 Agriculture

Eighty five percent of Municipal working age group (18-60) years were engaged in agriculture as their main economic activity. Therefore, urban agriculture forms significant land use in Sumbwanga Municipality. Farming land for crop cultivation is approximately 60,904 ha. The farmers harvest 150,941 tones of crops.

Table 3 : Existing Main Land Uses 2010

S/N	Landuse	Area (Sq.m)	Area(Ha)
1	Agricultural	68,441,693.6	6,844.2
2	Airport	311,046.1	31.1
3	Commercial Area	578,173.9	57.8
4	Conservation Area	18,196,361.8	1,819.6
5	Hazard Land	10,859,428.3	1,085.9
6	Industrial Area	8,188,970.30	818.9
7	Residential Planned	16,533,332.0	1,653.3
8	Residential Unplanned	15,382,080.2	1,538.2
9	Valleys	23,274,559.5	2,327.5
	Total	**161,765,645.8**	**16,176.6**

Source: *SMC, Social Economic Profile, 2008 and Fieldwork 2010*

1.8.3 Fishing

Fishing activities take place in Lakes Rukwa and Tanganyika; however people own small fish dams in the fringes of the municipal. In addition, fish storage, processing, and marketing activities are predominantly done within the urban areas.

1.8.4 Other Activities

Apart from the above mentioned social economic activities direct related to environmental resources, there are other potential activities that contribute much in environmental changes including;

1.8.4.1: Livestock keeping

Livestock keeping is the second economic activity after Agriculture employing about 12 percent of the total Municipal population. Animals kept include cattle, goats, donkey, poultry, pigs, sheep, hare, guinea fowls and pigeons.

1.8.4.2: Mining

Sumbawanga Municipal is endowed with mineral deposit which includes Emerald, Coal, Limonite, Hard rocks and sand which are found in almost throughout her area of jurisdiction. The level of mining is still low and to other areas extraction has not yet started. Table 4 below shows types of minerals and where they are found.

Table 4: Minerals found in the Municipal and their location

S/No	Type of Mineral deposit	Location
1	Limonite	Namwele
2	Coal	Namwele
3	Emerald	Mponda Village
4	Building materials	Kanda area

Source: SMC, NR Unit, 2014.

1.9 Infrastructural and Environmental Issues and Immediate Concern

1.9.1 Inadequate and deteriorating Road Network

Sumbawanga Municipal Council has a total classified road network of 297.65 kilometres. Out of this, 16.9 kilometres are paved, 42.3 km are engineered gravel, 49.1 km are partly graveled and earthed the rest are earth surfaced. Few roads are in a fair condition and some are laid with gravel, but lack side drains. Few road have no bridges where needed. There is two main roads have street lights in the entire Municipal; - Nyerere and Two ways roads. Some of the roads in Municipal are flanked by roadside ditches that drain surface water.

1.9.2 Spontaneous Development in Planned and Unplanned Settlements

Rapid urbanization amidst decrease of various institutions responsible for Municipal development and Management has resulted into spontaneous development in planned and unplanned areas. Transport and other structure cannot match with rapidly development of the urban;- Example the areas exhibiting with squatters are'- Katandala, Bangwe, Chanji, Bible, edeni and Old Sumbawanga.

1.9.3 Unlawful Mining

In the Municipality, there is some uncontrolled quarrying activities undertaken including -sand digging and gravel extraction. Other areas where mining is carried out illegally examples of areas prone to rampant quarrying are;- Malalangali and old Sumbawanga. Quarrying activities result into open pits and destruction of vegetation cover.

1.9.4 Fire outbreaks and Uncontrolled Tree Felling

Spontaneous fire outbreaks and illegal tree-felling in the forestry area were contributing to degrade the vegetation cover, water catchment areas, fauna and flora. About 30% of grassland and forestry are burnt every year in the urban areas. This upset the balance of the ecosystem and decrease water supply to the community. Common affected areas are; - Mbizi catchment forestry reserve, Kalangasa, and Itwelele.

1.9.5 Mismanagement of solid and liquid Wastes

Waste management is a major Challenge in Sumbawanga urban, where households' commercial activities, Industries and Market are main sources of solid and liquid waste production. Current, the Municipal generates about 250 tones per day of which only 64 percentages is deposed off in dumping sites while the rest accumulate near residential areas, open pits street

storm water drainage channels. More over the municipal as developed on oxidation ponds at Makutano but yet lack sewage network system to transport liquid waste.

1.9.6 *Uncontrolled Agricultural Practices*

Some livestock keepers in the urban proper keep large herds of live stocks and graze them at hazard against Municipal regulation. This conflicts with other land and resource uses in the urban setting, likewise, there are agricultural practices undertaken contrary to urban regulations. In addition, they employ unsustainable techniques such clearing farms by using fire, excessive application of agrochemical in vicinity of swamp sand unconventional cultivation on slopes.

1.9.7 *Inadequacy of Safe and Clean Water*

During the dry season water requirement of the Municipal is 8,000 M^3per day. The water Catchment band the shallow wells that supply water in the Municipal are unable to meet the full demand. In addition, the shallow wells are contaminated by fecal waste in pit latrines, septic tanks and improperly managed waste in the vicinity of the wells. In addition, water treatment and purification efforts are inadequate. This contributes to the periodically disease outbreaks. Some of the localities in the Municipal facing the problem are; - Izia, Katandala, Jangwani , Chanji and Mazwi.

1.9.8 Air pollution

Air pollution is a considerable problem in the Municipal; the main polluting agents are garages, sunflower and grain processing mills, brick burning kilns and motor vehicles dust winds and burning waste.

1.9.9 Inadequate Institution Arrangements to Address Environmental Issues

Complete lack or inadequate intersect oral collaboration and coordination among institutions incapacitate the implementation of programmes that address environmental issues.

CHAPTER TWO:

MUNICIPAL DEVELOPMENT SETTINGS

2.1 Education Sector

2.1.1 Characteristics

Education development can be evaluated through the implementation of Primary Education Development Plan (PEDP), Secondary Education Development Plan (SEDP), and non formal education. The major PEDP and SEDP strategic priorities are explicit. They include enrolment expansion, quality improvement, capacity building, institutional arrangements and engaging cross-cutting issues. The priorities of non-formal education sector in the municipal are not made explicit. Primary school enrolments have been rising for the past ten years as shown in table 5 and 6 below.

Table 5: Enrolment of primary schools pupils from standard I-VII for five years 2009-2013

Year	Enrolled pupils		
	Boys	Girls	Total
2009	21598	22596	44194
2010	21858	22795	44653
2011	22257	23475	45732
2012	21561	22290	43446
2013	21880	23558	45438
Total for five years	**109,154**	**114,714**	**223,463**

Source: SMC, Primary Education Department, 2014

Table 6: Student enrollments in form one from 2008 to 2012

Year	Candidates for Entrance Exams			Passed Candidates			Selected candidates			
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	%
2008	2427	2586	5013	2033	1808	3841	1110	1113	2223	57.9
2009	2455	2587	5042	1662	1438	3100	1329	1208	2537	57.39
2010	2285	2588	4873	1565	1313	2878	1565	1313	2878	100
2011	2118	2620	4738	1564	1605	3169	1256	1235	2491	78.7
2012	2276	2559	4835	1714	1711	3425	1321	1236	2557	74.2

Source: *SMC, Secondary Education Department, 2013*

Table 7: Students studying in Government secondary schools in the year 2012/2013

Class	Boys	Girls	Total
FORM I	1080	819	1899
FORM II	1693	1609	3300
FORM III	861	493	1354
FORM IV	1113	743	1856
FORM V	165	35	300
Form VI	157	34	194
Total for five years	**5069**	**3733**	**8802**

Source: *SMC, Secondary Education Department, 2013*

Table 8: Students studying Private Secondary schools in 2012/2013

Class	Boys	Girls	Total
FORM I	289	389	687
FORM II	441	629	1070
FORM III	336	395	731
FORM IV	318	277	595
FORM V	17	13	30
FORM VI	15	11	26
Total students in private secondary schools	**1416**	**1714**	**3130**

Source: *SMC, Secondary Education Department, 2013*

Table 9: Number of students of different certificate levels in Teachers Training College in the year 2013

Name Of Collage	Cource	First Year			Second Year			Total
		Male	Female	Total	Male	Female	Total	
Sumbawanga TTC	Grade A	156	132	288	219	99	318	606
St.Maurus TTC	Diploma	05	02	07	16	10	26	33
	Grade III A	12	10	22	23	10	33	55
	Pre-Primary	01	02	03	-	-	-	03
Rukwa TTC	Grade III A	233	53	286	351	81	432	718
Aggrey Chanji TTC	Grade IIIA	71	33	104	120	70	190	294

Source: SMC, Secondary Education Department, 2013

2.1.2 Types of Education and Facilitates and staff in the Municipality

The requirement of secondary school teachers is 720. At present there are 573 teachers in secondary schools among these male are 311 and female are 262. There is a shortage of 147 secondary school teachers. Table 10 describes the situation.

Table 10: Teaching staff in Secondary schools

Requirements	Available				Shortage
	Grade	Male	Female	Total	
720	Diploma	139	77	216	147
	Degree	171	180	351	
	Masters	01	05	06	
	Total	**311**	**262**	**573**	

Source: *Education Department, Sumbawanga Municipal Council 2013*

Table 11: The status of infrastructure and furniture in primary schools

No.	Type		Required	Available	Deficit	% Deficity
1	Classrooms		1023	444	579	56.5
2	Teachers House		1093	226	867	79.3
3	Pit – latrines	Boys	897	404	593	54.9
		Girls	1115	432	683	61.2
		Teachers	133	92	41	30.8
4	Offices	H/Teacher	60	51	9	16.3
		Staff	65	36	29	44.6
5	Stores		82	39	43	52.4

Source: SMC, Primary Education Department, 2013

Table 12: Secondary school infrastructure and furniture

No.	Type	Required	Available	Deficit	% of Deficit
1	Classrooms	315	226	89	28
2	Teachers House	720	66	654	91
3	Pit – latrines	613	264	349	56.9
4	Adm Block	17	10	7	41
5	Stores	22	7	15	68
6	Library	20	1	19	95
7	Hostels	17	6	11	64

Source: SMC**,** Education Department, 2013

At present, there are 982 teachers in primary schools, whereby male are 418 and female are 564.The requirement of teachers in primary schools is 1138 which makes the shortage of 156 teachers, table 11, 12 and 13.

Table 13: Teaching staff in Primary schools

Requirements	Available				Shortage
	Grade	**Male**	**Female**	**Total**	
1138	IIIB/C	9	13	22	156
	IIIA	367	525	892	
	Diploma	33	14	47	
	Degree	8	12	20	
	Masters	1	-	1	
	Total	**418**	**564**	**982**	

Source: SMC, Primary Education Department, 2013

2.1.3 Education Facility and Hand and in Demand

Municipal Council has 41 Pre-primary government schools and 2 private Pre- primary schools. There are 58 primary schools where by 55 are government schools including 1 school for disabled children called Malangali special school and 3 private schools. There are 27 secondary schools whereby, 17 are Government and 10 are Private secondary schools, 4 teachers training Colleges and 1 vocational training. Other Institutions are Adult Education Center and The Open University of Tanzania, table 14 describes the details.

Table 14: Existing educational facilities

S/N	Facility	Quantity	Ownership		
			Public	Private	Total
1	Pre-primary schools	Good	41	2	43
2	Primary Schools	Good	55	3	58
3	Secondary schools	Good	18	10	28
4	Teachers' Colleges	Good	1	3	4
5	VETA	Good	3	-	3
6	Open University	Good	1	-	1
7	Adult Education Institutes	Good	1	-	1

Source: *SMC, Education Department, 2013*

The Council has four (4) Teachers' Training Colleges (TTC). These are Sumbawanga TTC, St. Aggrey TTC, Rukwa TTC and St. Maurus Chemchem TTC. Course offered by the colleges are diploma, grade IIIA and Pre primary course at ST. Maurus. Sumbawanga, Rukwa and Aggrey Chaji offer Teacher Grade IIIA Course. Sumbawanga TTC also provides certificates in Domestic Science.

2.1.4 Resources used in the Education Sector

Land is the principal resource used by the education sector. The basic requirements for a primary school is land ranging from 1.5 -5 ha size in the urban area. Land is used as a site for school buildings, sports fields, and outdoor activities such as gardening especially in rural schools at large.

Another environmental resource used in the education sector is water. It is drunk, utilized in sanitary activities, and in school gardening. Data on the quantity of water used in the education sector is unavailable. Forests are another important resource in the education sector. Timber is one forest product used in construction of school buildings related to schooling activities. School furniture is made using wood from forests. Furniture includes chairs, tables, and beds for classes and hostels. The total requirement of timber by the education sector is not established. However, it does not constitute any serious over uses of the forestry resource. The minerals used in the education sector are;- cement, sand, gravel and stones. Many are used in construction, but some are used for production of materials used in teaching, for example lime for production of chalks.

2.1.5 Environmental Challenges facing the Education Sector

Strong winds occur in some few years and put property of educational institutions at risk. Some of the institutions the property of which has been damaged include Kiwelu, Katandala, Majengo, Malonje, Jangwani, Kisumba, Kizwite, and Chelenganya Secondary Schools plate 1 provides spatial description. However, the wind storms are not considered to be a major threat. Another environmental threat to the educational sector is communicable diseases. The most notable of these is cholera, the diseases affect staff and students. They strike often during the rainy seasons. Another threat is earth quakes. The Municipal of Sumbawanga is located in the location of the Great East African Rift Valley. The rift valley is a site of earthquake activities. Mazwi Secondary School has been struck by an earthquake, which caused damage to the school property.

(a) (b)

Plate 1 (a) The Collapsed toilet and (b) Collapsed Classroom facilities as were captured at Malagano Secondary and Kasense Primary Schools in Milanzi and Kasense Wards respectively. (**Source:** Site visit, 2014)

2.1.6 Government's Strategies on Strengthening Education Facilities

Among the government strategies to strengthen education sector is the improvement of laboratory, classroom, teacher's office and residential house, and toilet infrastructures. Moreover, qualified teachers enrollment is the fundamental process to facilitate quality education delivery to primary, secondary and college levels.

(a) (b)

Plate 2: (a) Construction of Improved Classrooms and (b) The Completed Quality Standard Classrooms as were found at Kasense Primary and Malagano Secondary Schools in Kasense and Milanzi Wards respectivelly. (**Source:** Site visit, 2014).

2.2. Agricultural Sector

2.2.1 Characteristic and importance

Agriculture is a predominant activity in rural wards of the Municipal. However, the amount of land under agricultural production varies from year to year. It is practiced as part time activity in urban wards. Its activities of crop production are a major economy section in the Municipality. Crop production is basic and of subsistence. The Municipal has 890 square kilometers of arable land which can be used for various crops cultivation, plate 3 below. People cultivate using hand hoes

and ox-drawn equipment. The latter includes ox-plough, cultivators and ridge planters. Rarely is powered machinery used in the farms. A family unit is the sole source of labor for most farming operations. Sometimes hired or communal labor may be used during peak cultivation and harvesting seasons. Agricultural land is communally owned under subject to village registration. Land preparation involves clearing of vegetation cover.

Table 15: Land use distribution in Municipal Council.

S/N	Land use	Area (km^2)	Ha
1.	Arable land	890.00	89,000
2.	Area under cultivation	646.59	64,659
3.	Water bodies	1.00	100
	Total	**1,537.59**	**15,3759**

Source; SMC, Agricultural Unit, 2014

2.2.2 Cultivated crops

Various kinds of food and cash crops are grown in the Municipal. Categories of the crops include staple foods, legumes, root crops and horticultural crops. The summary of acreage occupied by each variety is shown in table 15

Staple crops are the ones produced mostly in the municipal. These include maize, beans and finger millet. Maize and finger millet are used to prepare stiff porridge (ugali), and beans are used as side dish. Approximately 75% of the municipal residents eat stiff porridge and beans as their common meal. A large area of the municipal is suitable for production of maize and beans. Some of the maize varieties produced in municipality include Kitale, PANNA-614, HB-615, HB 614, SeedCo na Uyole HB. The bean variety includes Uyole, Urafiki, Kigoma and Balimi. Maize, Finger millet and beans are also used as cash crops. Others are sunflower, wheat and groundnuts.

Legumes include ground nuts, beans, soya beans and cowpeas. These are either used as food or cash crops. They are cultivated in circa 14,329 ha of the municipal area. Legumes require soils of particular qualities to grow. Sometimes they are intercropped with maize to restore and maintain soil fertility. Legumes mature in two or three months and are harvested before the crops they are intercropped with.

Root crops grown in the municipal include cassava, sweet and round potatoes which are the most important legumes in it. For many years root crops have been considered traditional food crops. They grow in drought conditions, and so are treated as a lifesaving during drought and periods of food shortage. Their roots consist of starch, and leaves are rich in protein and vitamins A and C. Root crops grow well in areas where soils are clay loam and sand clay.

Horticultural crops grown in the municipal include fruits and vegetables. Fruits are avocadoes, rough lemons, tree tomatoes, passion fruits, guava and peaches. Vegetables include tomatoes, cabbage, Kale, okra, Passion, African egg plant, carrots, sweet pepper, eggplants and amaranthus. Villages that are suitable for their growth include Isesa, Katumba Azimio, Mponda, Mawenzusi, Matanga, Ulinji, Mlanda, Mtimbwa, Tamasenga, Ntendo, Kanondo, and Wipanga. Production of horticultural crops is limited though the environmental conditions are conducive. Table 16 describe detailed production of different varieties

Table 16: Crop Variety and Average yield in the Municipal

S/N	Crop variety	Average area Cultivated (Ha)/Year	Average yield (Tons per Ha).	Total yield (tons per year)
1.	Maize	29,800	2.1	62,580
2.	Beans	13,773	0.9	12,396
3.	Sunflower	10,895	1.5	16,343
4.	Finger millet	110	1.5	165
5.	Wheat	875	2	1750
6.	Groundnuts	395	1.8	693
7.	Sweet potatoes	5993	3	17,979
8.	Round potatoes	1725	4	6,900
9.	Cassava	6	3	18
10.	Soya beans	26	1.2	31
	Total	**63,598**	**21**	**118,855**

Source: SMC, Agriculture Unit, 2014.

Table 17: Production of vegetables and fruits in the municipal

S/N	Crop variety	Average area Cultivated (Ha)	Yield per Hectare	Average yield (tones)
1.	Vegetables	611	8	4888
2.	Fruits	58	22	1276
	Total	**669**	**30**	**6,164**

Source: Agricultural Office, Sumbawanga Municipal.

Plate 3: Stake of maize product stored as wa captured at the NRFA Mazwi godown in Sumbawanga Municipality; (***Source:*** *SMC, Agricultural unit, 2014)*

2.2.3 Resource use and Support Activities in the Agricultural Sector

The climate and environmental conditions favor crop production. However, rainfall varies across time and is increasingly becoming unreliable. Rainfall is adequate when the rainy season is relatively long compared to the dry season, and periods of scanty rains feature an opposite pattern. When rain is adequate, people produce yield for sale besides consumption. However, if the rain is very high, it is associated with soil erosion, and may annihilate growing crops. During scanty rains, people produce less.

The area on which cultivation with irrigation could be practiced is 1,100 ha. The area includes the villages of Mlanda, Katumba Azimio, Tamasenga, Mtimbwa, Kisumba, Malagano, Chelenganya and Kanondo. There are 40 Tractors in the Municipal. 30 of these are operable, and 10 are out of use. There are 10 Power Tillers, and 2 are out of use. There are 3,120 ox-ploughs, 40 Disc plough, 5,569 ox Harrow, 49 ox Riger , 30 harrows, 85 riders, 103 cultivators, 1 planter and 403 carts. In addition, there are two 0x- training centres in Isesa and Katumba Azimio villages.

The types of fertilizers which are mostly used among farmers in this Municipal are organic and inorganic fertilizers. DAP, Minjingu, SA, UREA and CAN are the most inorganic fertilizers which are applied in the field during planting of crops and during the Top dressing period. Even though prices are very high, few farmers afford to apply. But too much use of those inorganic fertilizers in the same field may cause soil damage hence soil erosion. Also there are organic fertilizers which are mostly used by farmers like Farm Yard manure, Composite manure, and other decomposed crop and home residues. These organic manures although are of economic importance in soil conservation few farmers afford to use especially livestock keepers.

2.2.4 The importance of Agriculture in Municipal Council

Agriculture provides a potential source for Council's own revenue collection. It also provides self Employment to farmers and other people in the community by selling crops. It ensures food security at house hold level and provider raw material for small scale industries. Furthermore, agricultural products are source of raw materials for industries and Source of income to households. Byproducts from processing do provide livestock foodstuffs.

2.2.5 Impact of Agriculture on the Environment

Agricultural activities cause soil erosion and pollution. The intensive use of chemical fertilizers leads to soil alkalinity and acidity. And even though farmers in the municipality use sedentary farming methods, soil is prone to degradation because of unsustainable practices. This accelerates natural soil infertility and decline in yield.

2.2.5.1 Fertilizers Application

Too much use of inorganic fertilizers in the same field may cause soil damage hence soil erosion. Organic fertilizers are also mostly used by farmers like with access to livestock keeping. Farm Yard manure, Composite manure, and other decomposed crop and home residues are among the environmental friendly agriculture practices.

2.2.5.2 Pests and Disease

Pests and Diseases are the major problems which hinders the production of crops in the Municipal. Most of the pests which attack crops are stalk borers in maize production, Aphids in legumes, fruits and vegetables. Diseases are like Fungal, bacterial and viral diseases. Excessive use of these pests and disease control chemical do contaminate soil and water sources resulting into environmental hazards.

2.2.5.3 Insect and Pests Control

Most Insecticides which are commonly used by farmers during the period of crop management (Insect and pests control) are Novathion,Sumithion, Furadan, Karate and Selecron,Fungicides which are commonly used are Ivory 72, Ridomil, Blue Copper, Inaccuracy use of these chemicals in areas where there is slope land during the time of rainfall may be the source of water contaminations which leads to environmental damage.

Agricultural activities do also cause soil erosion and pollution. The intensive use of chemical fertilizers leads to soil alkalinity and acidity. And even though farmers in the municipality use sedentary farming methods, soil is prone to degradation because of unsustainable practices. This accelerates natural soil infertility and decline in yield.

2.3 Livestock keeping

The most important animals kept in Sumbawanga Municipal council are Cattle, Goats, Sheep, Chicken, Ducks and Pigs. There are 3 breeds of Livestock kept in Municipal Council; These are Local, Crossbreeds and Exotic breeds. All breeds are found in urban rural areas. Other animals kept include; dogs, Donkeys, Rabbits, Guinea fowls and Turkey. There are two rearing systems of Livestock being practiced in Municipality one being free range and Zero grazing. In the former livestock is grazed extensively on natural grassland in the rural areas of Municipal. Zero grazing, is common for dairy cattle and poultry. In 2013, the council was estimated to have a total of **235,507** different livestock animals. Table 18 below shows the livestock population in the Municipal Council in 2012/2013.

Table 18: Number of animals for each category in Sumbawanga Municipal Council.

Animal Type	**2011**	**2013**
Guinea Fowls	25	55
Kanga	517	738
Sheep	1,595	811
Donkey	1,008	1,211
Rabbits	2150	2770
Water Fowls	2,019	3,742
Dogs	7,747	7,961
Pigs	7,052	12,835
Cats	18,523	19,443
Goats	14,787	21,123
Cattle	29,692	41,433
Poultry	101,485	123,385
TOTAL	**186,600**	**235,507**

Source: Sumbawanga Municipal Council (Agricultural Services Unit), 2013.

2.3.1 Environmental resources supporting livestock development.

2.3.1.1 Improved farm pastures.

The total area used for rearing animals is about 41,500 hectares.The improved pastures developed are an area of about 670 hectares for cattle. The allocation of those farms of pasture is as follows:-

Table 19: Pasture farms for dairy cattle

S/n	Village located	Area planted (Sq. m)	Types of Pastures
1	Kankwale	123	Elephant grass, Desimodium, Leucaena and Rhodes
2	Mtimbwa	20	Elephant grass, Leucaena, Rhodes
3	Matanga	17	Elephant grass and Rhodes
4	Nambogo	27	Elephant grass, Leucaena, Rhodes
5	Katumba Azimio	32	Elephant grass, Leucaena, Rhodes
6	Makazi mapya	11	Elephant grass and Rhodes
7	Mponda	21	Elephant grass, Leucaena
8	Chelenganya	20	Elephant grass, Leucaena, Rhodes
9	Mbalika	13	Elephant grass, Leucaena, Rhodes
10	Ntendo	3	Elephant grass
11	Pito	9	Elephant grass, Leucaena and Demosdium
12	Kanondo	14	Elephant grass, Leucaena, Sesbania and Demosdium
13	Milanzi	19	Elephant grass and Demosdium
14	Kinamwanga	20	Elephant grass, Rhodes and Sesbania
15	Isesa	27	Elephant grass
16	Chipu	20	Elephant grass, Rhodes
Total		**396**	

Source: SMC, Livestock and Fisheries Department, 2014

2.3.1.2 Other Livestock infrastructural supports

Table 20 describes the several livestock handling infrastructures that are found in Sumbawanga Municipality.

Table 20: Livestock supportive infrastructures

S/n	Type of facility	Quantity	Condition:	Ownership
1	Dip tanks	8	Functioning	Sumbawanga Municipal Council
		2	Not functioning	Sumbawanga Municipal Council
2	Abattoirs	1	Functioning	Private
		1	Functioning	Sumbawanga Municipal Council
3	Hide shelter	4	Functioning	Private
4	Permanent crash	1	Functioning	Private
5	Slaughter slabs	2	Functioning	Private
		2	Under construction	Sumbawanga Municipal Council
6	Primary Livestock Market	1	Under construction	Sumbawanga Municipal Council
7	Milk collection centres	3	Functioning	Sumbawanga Municipal Council
8	Milk processing centers	1	Functioning	Sumbawanga Municipal Council
9	Butcher shops	45	Functioning	Private
10	Watering dams			

Source: SMC, Livestock Development, 2014

2.3.2 Contribution of Livestock Sector to the Municipal Economy.

Livestock keeping has significant contribution to the municipal economy. Among these are; provision of food (i.e meet, Milk, Milk products and Eggs) to mention few, provision of employment, and provision of raw materials for industries (i.e hides, skin and horns). It also, contributes to provide Organic Manure which increase soil fertility, source of household's income and revenue collection through taxation. Oxen are used as agricultural implements for ploughing and transportation.

2.3.3 Environmental Challenges from Livestock Sector.

There are several environmental impacts due to Livestock activities and Livestock developmental projects. Land degradations due to overgrazing and soil erosion and air pollution due to ammonia gas evolved from urines of cattle and smell of Acaricide drugs from dipped cattle are among these. Others include; Spreading of diseases to human being, Poor livestock breeds, Inadequate Infrastructures e.g. Crush and dip tanks and insufficient marketing systems of livestock and livestock products. Inadequacy of improved pastures, incidence of diseases, e g: Rift Valley fever and African swine fever. Low Level of Education to farmers does also prohibit proper livestock v/s Environmental management practices.

2.3.4 Measures to Mitigate Environmental Challenges from Livestock Sector

The common mitigation measure considered to minimize environmental challenges includes; Planting of trees and grasses, advising the farmer's towards the use of zero grazing rather than free range rearing systems, minimizing stocking density in grazing areas and construction of Acaricide waste disposal pits in each dip, frequent dipping, introduction of improved livestock breeds. Enforcement of Environmental and animal keeping by laws are also the mitigating initiatives to enhance sustainable animal keeping.

2.4 Fish Processing and Marketing

2.4.1 Characteristics of fishing activities

Sumbawanga Municipal Council has large area suitable for fish farming. This is due to the fact that all villages in all fifteen wards have many sources of spring water available in long period of the year, the council have 555 ponds located in different Municipal village as indicated in table 21 below. The type of fishing conducted is by using inferior gears such as seine net.

2.4.2 Environmental Hazards Impacting on Fishing

Main environmental hazards for fishing activity is drought, the drought condition is depletes the amount of water in the water bodies hence it causes non permanent dry out. The production of fishes is affected by these conditions. Silting is another hazard impact, it caused by heavy rains which flood water bodies and carry silt loads that deposit in ponds and min –dams.

2.4.3. Fishing and Environmental Degradation

Fishing, processing and marketing do emit pungent fish smells that contribute to atmospheric pollution. The use of illegal chemicals in fishing contributes to pollution in water bodies and affects aquatic ecosystems. However, the use of chemical has not been reported in the Municipal.

Table 21: Distribution of fishing ponds in the Municipality in 2013

S/N	Ward	Village/Street	Number Of Ponds
1	Senga	Kankwale	122
2	Pito	Katumba Azimio	260
		Pito	51
		Malagano	27
3	Milanzi	Milanzi	26
		Nambogo	8
4	Kizwite	Utengule	1
5	Kasense	Mtimbwa	16
6	Matanga	Chelenganya	6
7	Sumbawanga Asilia	Mbalika	24
		Kaswepepe	4
8	Malangali	Makazi Mapya	5
9	Mollo	Malonje	8
10	Mazwi	Mazwi	5
11	Majengo	Majengo	1
12	Katandala	Katandala	1
13	Izia	Eden	2
14	Ntendo	Ntendo	12
		Total	**555**

Source: Sumbawanga Municipal Council (Agricultural Office) 2013

2.5: Industries

2.5.1 Categories of industry sector in the Municipal

The Municipal has a few primary industries that process locally produced raw materials.Most industries have been allocated to two specially designated major industrial zones in Kizwite- Magereza, and Mazwi The industrial sector employs 12,890 people in both formal and informal sector. This is about 57.1% of workforce in the Municipal. In Sumbawanga Municipality industries fall into the following categorically, light industries ;(i.e.) meat processing, services, depots, Agricultural produce, textile, chemicals, food and beverage production. The service industries include; - SIDO, TANESCO power plant, and other small-scale projects run by individuals. There are about 98 formal and 274 informal food and beverage industries in the Municipality, Besides the industries explained above, there more than 254 small scale industries. These include vehicle garages, tinsmith centers, carpentry workshops, shoe making and repairs, production of leather products, and tailoring.

Table 22: Light Industries present in Sumbawanga Municipal council

Na	Type of industry	owner	Location (Ward)
1	SAAFI Meat Factory (Meat abattoir):	Mzingakaya	Kizwite
2	Dew drop (Drinking water processing)	Tawaqal	Kizwite
3	Energy Milling (cereal processing industry)	Tawaqal	Kizwite
4	Barka milling (cereal processing industry	Salehe S.Abdallah	Malangali
5	SIDO (Small scale various processing products	Government	Izia
6	Agro processing mills (Grain processing mills)	Private sector	Various areas
7	Small formal textile industries	Private sector	Various areas

Source: Site visit, 2014.

(a) *(b)*

Plate 4 *(a)* Dew drop industry (processing drinking water), (b) Energy mill industry both located at viwandani area found in Kizwite Ward. (Source: Site visit, 2014)

2.5.2 Challenges facing industrial sector

- Un reliable power supply resulting to high production cost that call for use of alternative energy
- Poor infrastructure such as road for transportation of crops from rural areas to the industries and from the industries to markets.
- Incompliance to undertake Environmental and Social Impact Assessment that result in insufficient environmental safeguards for projects established.

2.5.3 Resources used by the Industrial Sector

2.5.3.1: Energy resource

Land is the basic resource needed in industrial development. More than two hundred and twenty hectares of land in the Municipality is located for industrial development, but only 24% of it has been developed. All industries use electricity and petroleum products as main source of energy. According to TANESCO, there is sufficient electricity for current and future needs of industrial consumption. Currently, the existing electric plant source is generating sufficient Kilowatts that satisfy the need for industrial and domestic uses.

2.5.3.2: Water resource

Water is one of the primary resources used by industrial sector, few industries use water in their daily activities. It is used for washing, cooking and as a product component. Small scale industries do not require large quantity of water; however, the abattoir and meat processing plants consume most water by the municipal standards.

2.5.4: *Impact of Industrial Development to Environment*

As it is observed worldwide, industries functions found in the council are also have behavior for degrading the environment in different ways. The main pollutants to environment include;- waste waters, carbon dioxide from industrial exhausts and smokes from burning grains husk creating bricks another environmental effects contributed with industries are'- pungent smell from meat processing industries and Unmanaged dust from cereal milling machines example the area most affected are;- Jangwani , Mazwi at area constructed godown. Few cases of noise pollution was reported in the Municipal, areas generating noise pollution are garages during vehicle repaired and music recording centers.

2.6. Commerce

2.6.1 Characteristics of Commercial in the Municipal

The commercial sector provides employment to many people in Municipality, commercial activities ranges from small and simple retail shops to large whole sale centers trading and financial enterprise. More than 81% of the commercial enterprises are owned and run privately. The small scale activities include;- retail shops, groceries, stationary, hotels, pharmacies, salons kiosk, charcoal and firewood selling there is small petty trade of snacks and fruits oil mill processing, beverage and garages. Commercial locations are categories in commercial proper and commercial cum-residents areas. The former is concentrated in the central areas of the town such as Mazwi and Jangwani.

The financial and commercial Institutions which provide credits and other financial services for various activities found in the council are banks includes;-;-CRDB Bank Limited-, National Microfinance Bank Limited (NMB)- National Bank of Commerce and Tanzania Postal Bank Limited. Others are NBC National Insurance Corporation (NIC), National Social Security Fund (NSSF). Information on credits provided by four banks mentioned above these banks have not been sufficiently used by locals for development projects. Loan provided are of small amounts mostly for employees to purchase home appliances and other individual needs. Other economic activities are transportation, communication Public utility, community facilities and administration.

(a) (b)

Plate 5: (a) CRDB Bank Limited-Sumbawanga branch and (b) NMB- Sumbawanga branch (**Source;** SMC, Social Economic Profile, 2014)

2.6.2 Resource Use by the Commercial Sector

Land is very potential resource for allocation of commercial activity includes small scale. The commercial sector occupies 7% of Municipal land. This is besides of other potential resources such as road, electricity and houses. Commercial sector requires more than 1000 $m^3$of water per day. The demand is high during dry season. The entire commercial sector suffers as result because during dry period only half of total demand was supplied to the commercial sector.

2.6.3 The impact of Environmental Hazards on the Commercial Sector

One of environmental hazards in the Municipal is flood. This caused by heavy rain falls. Floods disrupt the transport and communication infrastructure and disengage the municipal from other areas within region. Another hazard is strong winds which characterize the climate of the municipal. They blow the roofs of commercial buildings and trading centers hence contribute to loss of properties.

Some location in the Municipal manifest and degradation from mining activities, the extraction of construction has defaced the land surface, causing impediments to some or urban development For instance, sand mining has destroyed road surface infrastructure in Chanji, Kizwite and Malangali.

2.6.4 Contribution of the Commercial Sector to Environmental Degradation

Industrial pollution varies with typical industries and nature of their resource use. For example grain milling, burn crop chaff and pollute the air accompanied with smokes and dusts. Pollution is evident in municipality; it is largely contributed with waste mismanagement, uncontrolled wastes in the market areas, residue from sunflower and rice processing mills. In addition there are hastily disposed of plastics bags and other litter that sometimes complicated movements of goods and services related to commercial sector. The council is on process for constructing new dumping area at Makazi mapya so as to manage solid wastes.

2.7: Energy

2.7.1 Characteristics and Importance of Energy Sector

Sumbawanga Municipal has 43,706 households of which 4,370 households have access to electricity and less than 200 households use solar power for lighting and for domestic consumption. The energy sector is one of key areas that could develop in the municipal; sources of energy for the Sumbawanga municipal council include biomass (Mainly fuel wood and charcoal), oil (Kerosene, diesel and petrol) Petrol and diesel are used mostly for commercial purposes such as in producing electricity in manufacturing industries and transport sector. The wood fuel are used both for commercial and domestic purposes.

According to study done in the municipal streets, household sector consumed about 98 percent of all energy consumed with households, it estimated about 89,234 m^3per year. The price of charcoal varies 25,000- 30,000 per bag. A family of 6 people needs 21 bags per year is year in rural areas. The council needs to initiate an effort to encourage community to utilized alternative energy resources. However, this is very expensive for families to afford it.

Sumbawanga Municipal is not connected to the National power grid. The energy sources of power used is from Zambia and generators which found in Sumbawanga urban.

Plate 6 *Power generation at Sumbawanga main station-Majengo area (***Source;** TANESCO head office-Sumbawanga 2012)

2.7.2 Resource Used in the Energy Sector

Forest is a major source of energy in the municipality, present natural forest reserves and community woodlots are not satisfied to supply energy source to the community, about 134 km^2 of municipality land occupied with forest. They are not sufficient to supply energy to the community. There are other forms of energy that could be harnessed as well. This includes coal, biogas and solar panel.

Fossil fuel such as Kerosene is used for provision of lighting mostly in the villages around Sumbawanga town. Recently there are introduction of alternative sources of energy of solar power and Gases which are now used by residents both in town and villages. The survey revealed that only 4.5% of the population in the council consumes hydroelectric power from Mbala Zambia and 0.001 they use solar power. Domestic energy requirements are at most met by fuel wood and charcoal.

In areas of rural settings where the national grid has not passed, the supply of high quality solar materials and equipments with affordable prices could be an ideal investment for investors. Other electricity supply sources which need to be looked are Coal which is available in plentiful in the council approximated to be 5 million metric tons of coal reserve in Namwele that are able to be alternatives energy source in the Municipal and National wise.

2.7.3 Impact of Environmental Hazards on the Energy Sector

Floods limit the availability and supply of dry fuel wood in the municipal; in addition, floods disrupt the transport networks. This results in abrupt hikes of fuel. Heavy rain falls and floods affect electricity lines hence disrupt power supply.

2.7.4 The energy Sector and degradation of the Environmental Resources

The utter dependence on bio fuel;- charcoal and firewood contributes to increase rate of deforestation, negative health effects and an increase in greenhouse gas emissions. However, it is estimated that about 89% per cent of households still use traditional inefficient charcoal stoves. The health effects of cooking with charcoal and firewood are;- lung cancer. Cataract and possibly aggravate incidences of tuberculosis. In Tanzania, it is estimated that 4.4 percent of all diseases are caused by cooking using biomass fuel (WHO, 2007).

2.8 Health Care

2.8.1 Over view of the Health Situation and Facilities

Sumbawanga Municipal Council will continue providing Health services guided by National Health Policy under Health facility levels. Implementation of Public Private Partnership (PPP) is involved in Health services provision in the Municipal to Community. The Municipality residents are at escalating risk of falling victim to endemic and sometimes episodes of epidemic diseases. Most of the health problems can easily be managed, but this cannot be achieved at 100%. Among of the reason for this include ignorance, lack of education to disease control and low economic status of many residents.

2.8.2 Situational Analysis

Among the prevailing diseases, malaria is ranked the highest occurrence, while fracture dislocations seem to hold the lowest rank among all cases Table 23 However; the most affected age is under five years.

Table 23: Prevalence of common diseases in the municipality for the past five years.

	SEVERE MALARIA		PNEUMONIA		DIARRHOEA		ACUTE RESPORATORY INFECTION		ANAEMIA		UTI		SEVERE PROTEIN ENERGY MALNUTRITION		BURNS		FRUCTURE DISLOCATIONS	
AGE→ YEAR↓	<5	5+	>5	5+	>5	5+	>5	5+	>5	5+	>5	5+	>5	5+	>5	5+	>5	5+
2009	22,803	22,849	2,044	4,171	6,665	6,165	7,857	11,404	520	475	896	4,216	252	107	269	201	-	-
2010	22,602	26,026	4,220	2,912	9,373	5,224	12,711	10,164	518	525	2,995	3,593	231	165	341	199	-	-
2011	13,377	18,102	3,648	2,115	5,511	2,725	10,278	8,354	204	417	2,670	3,401	413	188	385	75	40	42
2012	22,618	20540	2,113	1,482	2,243	436	2,772	2,234	391	314	1,848	1,276	125	46	280	189	380	90
2013	12,415	18,091	2,935	2,558	5,224	4,854	10,901	13,822	269	418	274	5,065	191	115	69	148	-	-
TOTAL CASES	199,423		28,198		48,420		180,219		4,051		26,234		1,833		2,156		552	

(***Source:*** *SMC, Health Department, 2014)*

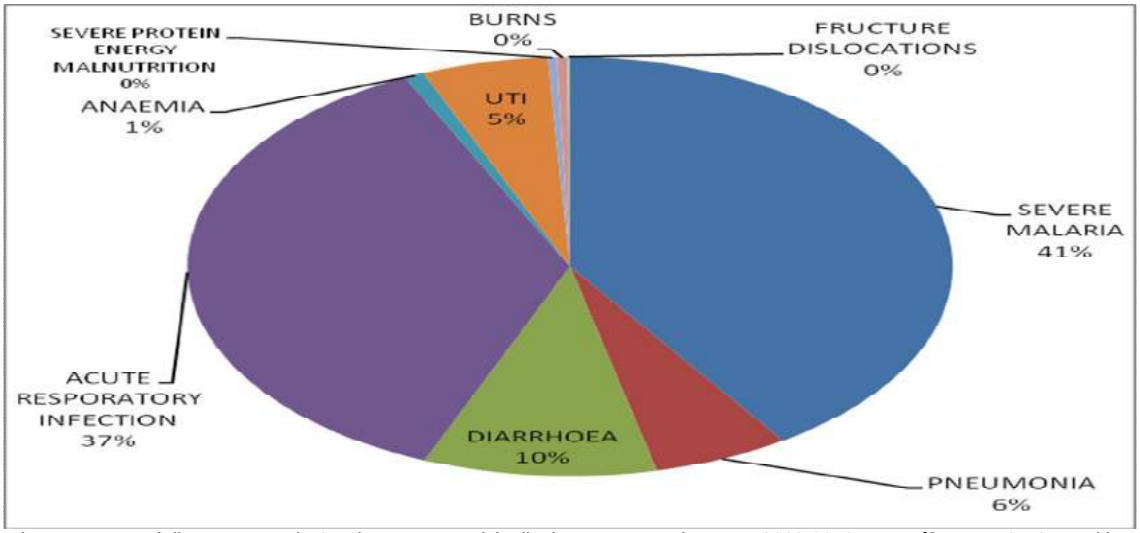


Figure 2: The severance of disease cases in Sumbawanga Municipality by percentage between 2009-2013 years. ***(Source:*** *SMC, Health Unit, 2014)*

2.8.3 Resource used in the Health Care Sector

A number of resources are available supporting the provision of adequate and quality health care. Among these are the hospitals, health centers and dispensaries owned by government as well as private organizations. Currently the Sumbawanga Municipal has a total of 2 hospitals, 3 health centers and 29 dispensaries. The existing Health facilities are analyzed in Table 24 below with their ownership.

Table 24: Health facilities by level owned by LGA, government parastatal, voluntary agency and privates

Type of health facility	Ownership					Total
	Government	Government Parastatal	Faith Based health Facility (FBO)	Private owned	Individual	
Hospital	1	0	1	0		2
Health centers	1	0	2	0		3
Dispensaries	18	3	2	6		29
Grand total	**20**	**3**	**5**	**6**		**34**

Source: SMC, Health Department and field visit, 2014

Sumbawanga Regional Hospital is the only Government Hospital in the Region despite of Dr. Atman Hospital identified as a Municipal Council Designated Hospital and it serves almost the whole Region population. Dr. Atman Municipal Council Designated Hospital serves a total population of 209,793 accommodating also residents of the neighbor district councils including Sumbawanga District Council and Kalambo District Council. The Council is planning to construct its own Municipal council Hospital. The locations of these facilities are shown in the table 25 below.

2.8.4 Health centres

Sumbawanga Municipal Council owns Mazwi Health Centre. Others are Katandala and St. Theresia Health Centres owned by Religious institution (Catholic Church), all together serving the municipal population together with Dr. Atman Hospital. Mazwi Health centre is the only referral Health Centre in the Municipal serving a total of 29 Dispensaries. Council has the Vision to upgrade some of its Dispensaries to Health Centre level.

2.8.5 Dispensaries

In Sumbawanga Municipality we have a total of 29 dispensaries, among them 18 are owned by the Municipal Council, 3 owned by Government parastotals, 2 owned by Religious and 6 owned by private individuals. All these serve a total population of 209,793. The table 26 here under, shows the distribution of the available facilties by Division and ward.

2.8.6 HIV/AIDS

2.8.6.1 Prevention of HIV/AIDS and STIs

Prevention of HIV/AIDS is practiced under Health Department as both curative and preventive activities where treatment and Health education with preventive measure is implemented. Since HIV/AIDS is an crosscutting issue the Community Development is implementing it in preventive services for Community behavioral change and education on use of Condoms some more preventive Measures. Relation of Sexual transmitted infection and the infection of HIV as core Diseases is openly discussed in the Community during training and mass meeting. Voluntary counseling and testing of HIV/AIDS implemented by Health services delivery through all Health facilities and the VCT Angaza centers in the LGA. Results of HIV/AIDS tested by age are described in the table 27 below.

Table 25: Hospital facilities in Sumbawanga Municipality with their locations

SN	Level of facility	Location (Ward)	Name of facility	Number
1	Hospitals	Majengo	Dr. Atman Hospital	1
		Mazwi	Regional Hospital	1
		Total		2
2	Health Centers	Mazwi	Health centre	1
		Katandala	Health centre	1
		Chanji	St. Theresia Health centre	1
		Total		3
3	Dispensaries	Pito	*Katumba Azimio	1
			Malagano	1
			Pito	1
			Tamasenga	1
		Mollo	Mawenzusi	1
			Malonje	1
			Ulinji	1
			Isesa	1
			Mollo Prison Dispensary	1
		Senga	Senga	1
			*Wipanga	1
		Ntendo	Ntendo	1
			*Luwa	1
			Kanondo	1
		Kasense	Mtimbwa	1
			Kasense	1
			Chipu	1
		Matanga	Matanga	1
			Kisunba	1
			Chelenganya	1
		Milanzi	Mlanda	1
		Kizwite	Kizwite	1
		Mazwi	Mkeku	1
		Katandala	Kasema	1
			Mzava	1
			Ufipa	1
			Sabato	1
			Polisi	1
		Majengo	Sangos	1
			Majengo	1
		Chanji	King'ombe	1
		Izia	Mwanawima	1
		Malangali	Malangali	1
	Total			33
4	VCT	Mazwi	Angaza VCT	1
		Katandala	Katandala VCT	1
		Majengo	Dr Artman VCT	1
		Total		3

Source: Health department, Sumbawanga Municipal Council and field visit 2013

Table 26: Dispensary facilities in Sumbawanga Municipality

Divison	Ward	Number of dispensaries
Lwiche	Katandala	5
	Majengo	1
	Chanji	2
	Izia	1
	Kizwite	1
	Mazwi	2
	Malangali	1
Itwelele	Pito	3
	Mollo	4
	Senga	1
	Ntendo	3
	Kasense	2
	Matanga	2
	Milanzi	1
Total		**29**

Source: *SMC, Health department and field visit, 2014*

Table 27: Results of HIV/AIDS tested by age

Age	Tested		Total tested	HIV positive		Total HIV positive	Rate of infection (%)
	M	F		M	F		
<15	192	259	451	38	63	101	0.2
>15	18,683	16,906	35,589	1194	1543	2737	7.6
TOTAL	**18,875**	**17,165**	**36,040**	**1232**	**1606**	**2838**	**7.8**

Source: SMC, Health department and field visit 2013

Table 28: Provider initiative test and counseling (PITC)

Age	HIV tested		Total HIV tested	HIV positive		Total HIV positive	Rate of Infection (%)
	M	F		M	F		
<15	388	315	703	23	29	52	1.0
>15	2140	2447	4587	240	279	519	9.8
TOTAL	**2528**	**2762**	**5290**	**263**	**308**	**571**	**10.8**

Source: SMC, Health department, and field visit 2013

Care and treatment cumulative number for LGA is shown here below by two categories of clients elaborating the pre - ART and ART cumulative number in tables 29 and 30.

Table 29: Pre-art Clients

Age	Male	Female	Total
<14	433	512	945
>14	3887	6838	10725
TOTAL	**4320**	**7350**	**11670**

Source: *SMC, Health department, and field visit 2014*

Table 30: Art cumulative number

Age	Male	Female	Total
<14	74	195	269
>14	2394	3950	6344
TOTAL	**2468**	**4145**	**6613**

Source: SMC, Health department, and field visit, 2014

Table 31: Attended STI cases in the LGA

Age	Male	Female	Total
<14	2	6	8
>14	548	1111	1659
Total	**550**	**1117**	**1667**

Source: *SMC, Health department, and field visit 2014*

Most of Health Facilities in the LGA provide the STIs services and treatment and is also providing Health Education on Prevention of STIs, care and Treatment of STIs, impact of STIs to an Individual and the HIV/AIDS. 24 Health Facilities are Providing Health Services on STIs control, Prevention, care and treatment in Sumbawanga Municipal Council.

2.8.7 Environmental Challenges observed in Health Sector

Among of the challenges facing standard and valuable health services is the deterioration of health facilities. These include health centers and dispensary infrastructures like buildings, toilets for workers and patients, residential houses for health workers and insufficient number of health providers to mention few. This has been a big challenge that needs collaborative initiatives from all stakeholders to invest in the sector so as to reduce the impacts of these challenges. Plate 7 emphasizes the real situation of some of the building infrastructures as was found at King'ombe Dispensary.

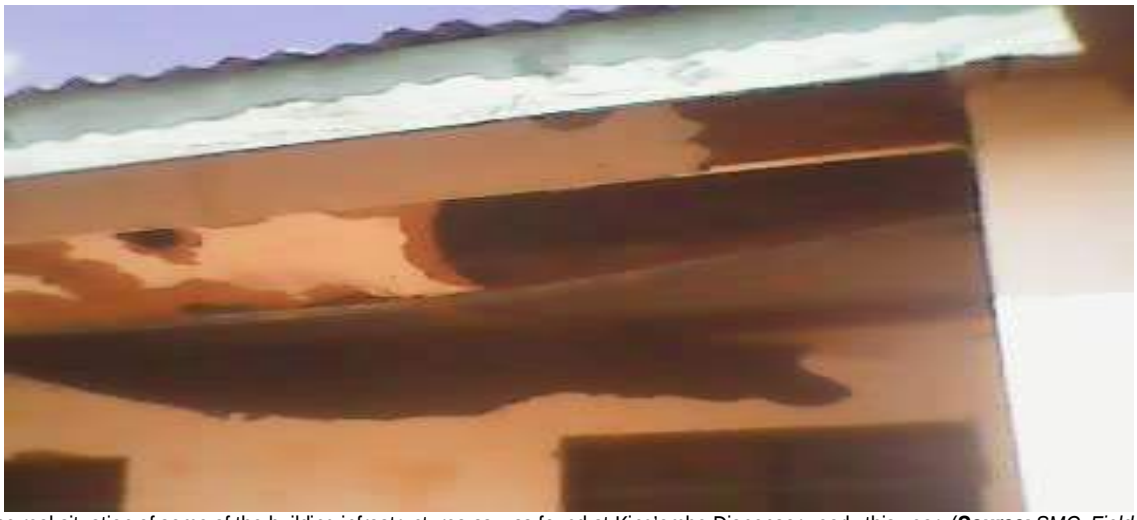


Plate 7: The real situation of some of the building infrastructures as was found at King'ombe Dispensary early this year. (***Source;*** *SMC, Field visit, 2014*)

2.8.8 Government Strategies on Health Sector Strengthening

Through different Government and Non Governmental Organizations, the government has been making the all possible initiatives to invest in health sector. A number of quality health and accommodation buildings have been increasing to uplift the standard quality of service delivery. A good number of qualified health provider personnel have been increasing each year and at least one dispensary has been established at every village in rural areas. Plate 8 shows one of the newly constructed dispensaries at different areas within the Municipality as strategies of the government to improve services in health sector.

Plate 8:The New Dispensary Building as was found in Chelenganya village, Matanga Ward. ***(Source:*** *Site visit, 2014).*

2.8.9 Contribution of the health sector to environmental degradation

Waste products that are generated in hospitals and dispensaries are not treated and collected. Most of them are kept in open dumps in the outskirts of the Municipality; this is hazardous to environment and people's health.

2.9 Tourism and Recreation

2.9.1 Characteristics and Importance

The tourism industry is not well developed in Municipal, there are few tourism activities. However, Mbizi Forestry reserve has peculiar and attractive flora and fauna that includes; endemic vegetation and animals. This forestry resource has considerable to be attractive tourism and picnicking .In council, there are few recreation activities include; - selling beverages in bars, clubs and some restaurants and sports take place at Mandela. Sports and game facilities provide entertainment and help maintain personal physical health conditions. The bands and cultural groups entertain in various festivals and ceremonies.

2.9.2 Resources use in the Tourism and Recreation Centers

Land is one resource of foremost importance in all sectors. In tourism sector and recreation, it provides space for tourist centers and installation of recreation facilities.

Biodiversity is another resource that is important in tourism and entertainments sector, the scenic values of biodiversity promotes tourism. Mbizi forestry reserve, with its unique biodiversity could be used to that end. The census of 2005 by the southern Highlands Conservation Program estimated there were more than 800 red colobus monkey and 173 species of plants.

2.9.3 Impact of Environmental Hazards on Tourism and Recreation

Periods of excessive rainfall discourage outdoor sport in the municipal. People cannot participate because many of the sports grounds are drenched with water.

2.9.4 Contribution of Tourism and Recreation to Environmental Degradation

Person who are touring at sites and engaging in sports tend to litter, bites bottle, paper and food packaging are often discarded irresponsibly on the sites contributing to waste mismanagement. The overall result is environmental pollution.

2.10 Water Supply

2.10.1 Demand, Source, Storage and Distribution

Table 32 describes the status of water supply in urban areas of the Municipality. The amount of clean water available in the municipal does not meet demand, the actual supply is 30- 40% of the actual demand. The inability to structure of water infrastructure to keep up with rapid land development, water loss in the distribution system and poor maintenance of water supply infrastructure contribute to shortage.

Table 32: Municipal Water sources, their capacity and intakes

River/ stream	M^3 per day	Intake location
Kanantumbi	2020	Wipanga
Mzika	Not available	Wipanga
Muva (New)	1,690	Muva
Ndua (New)	1,200	Isesa
Momoka	1,350	Senga
Mwambazi	1,400	Mbizi

Source;- Sumbawanga Urban Water Supply and Sanitation Authority (SUWASA)

There are 16 boreholes and shallow wells with their capacity of supply 36,500 M^3, Also their five reservoirs serving the Municipal proper, table 33. They have a storage capacity of 103M^3, these include private storage facilities with capacity of 95m^3

Table 33: Water storage tanks in the urban proper in the Municipal

Facility location	Capacity M^3	Conditional Remarks
Katandala	680	Satisfactory
Region Hospital tank	43	Good
Regional blocks	135	Satisfactory
Kizwite	225	Satisfactory
Private storage tanks	95	Good
Makao Makuu	130	Satisfactory
Kristo Mfalme	225	Satisfactory

Source; - *Sumbawanga Urban Water Supply and Sanitation Authority (SUWASA), 2014*

Sumbawanga Municipal council (Urban proper) has four water tanks that are under construction process started in year 2014 and expected to be accomplished in the year 2015, as shown in table below, the water distribution pipe network serves about 78% of municipal residents in the urban proper. In addition, there are 61 deep wells, 32 shallow and 15 gravity schemes. There are several institutions that oversee water supply in the rural area of the municipal, these are CARITAS, NGO's conduct their activities through community participation. There is an abandoned well in Chanji. The pipe network was in poor quality, given the nature of its areal terrain. Boreholes are also used to supplement water supply. There are five reservoirs serving the municipal urban proper. They have a storage capacity of 1,030 m3, These include the private storage facilities with capacity of 95m3 for private use. Most of the areas in the inner-city are supplied with clean water.

2.10.2 Water resource supply in the Municipal rural areas

Underground water is a main resource for water supply. Boreholes and wells, natural springs as well as seasonal and permanent water streams are the valuable sources of water in rural areas, supported with few pipes to distribute to large coverage. Most of the water supply systems depend on gravitational force by trapping the stream at some point, direct it to storage tanks and then distributed to users by gravity or by solar energy system in few water tanks. A total of 42,668 people are saved with clean water equal to 49 percent of the total population of 87005 from seven rural wards. Plate 9 describe the real situation in some of the water supply services.and Table 33 summarizes the status.

2.10.3 Impact of Environmental Hazards on the Water Supply Sector

There are four environmental issues that have negative implications to water supply in the Municipality; include;- flooding which causes raises water turbidity. In addition, flooding erodes soil that covers the distribution pipes and leavens them to agents of destruction. Water pollution reduces the quality of clean water that can be supplied in the municipal. The main sources of pollution are Agrochemical applications, overgrazing. Desertification and drought condition caused with degrading water catchment areas and the soil moisture in the ground. In the Municipal desertification is caused by uncontrolled tree felling, bushfire and cultivation at wetland and water sources especially in Lwiche swampy vegetation.

2.10.4 Contribution of the Water Supply Sector to the Environmental Degradation

The process of supplying water imposes remarkable dislocations on land during construction of water supply infrastructures; Clearing of natural vegetation cover during installation of water supply networks may contribute to deforestation and land degradation. Siltation is also observed at considerable phenomena in water supply projects implementation. This is more prone during the rainy seasons where soil and mud accumulate in the ditches and pipes blocking the smooth flowing trend, this further result in uncontrolled water flow to cause surface erosion causing also damage to other infrastructural networks.

Moreover, vegetation clearance and ditch constructions are observed to cause significant environmental dislocations during the pipe laying and tanks construction. Solid wastes such as cement bags and pipe residues contribute also to environmental degradation if not well managed during construction and system management phases. Decreased natural water flows are normally observed due to water divergences to new water directions causing disturbed environmental habitats to formally dependant fauna and flora.

(a) (b)

Plate 9: Water supply projects trapping water resource at their natural springs; (a): Trapping at the Malonje natural springs in Malonje village and (b), the trapping at Mlanda natural water catchment area in Mlanda village. These projects intend to save population of the surrounding villages of Mollo and Milanzi wards. *(**Source:** SMC, Site visit, 2014)*

(a) (b)

Plate 10; The completed water supply projects in rural areas. (a): The completed water storage tanks and (b): The solar energy technology introduced to support water distribution as were found at completion stage of the Malonje water project. *(**Source:** SMC, Site visit, 2014)*

Table 34: A summary of water service provision in rural areas of Sumbawanga Municipality.
(NB: *No formal water supply project)

Ward	Village	Village Population	Population saved	Percentage of coverage	Water supply points		Type of water source
					Total	Functioning	
MOLLO	Isesa	4671	3250	69.6	13	13	Piped
	*Mawenzusi	5723	0	0	0	0	Natural springs
	Malonje	2799	2799	100	15	15	Natural spring protected
	Ulinji	2513	1000	39.8	4	4	Piped
PITO	Pito	2038	2038	100	20	9	Bore holes
	Tamasenga	4916	2750	55.9	12	11	Piped
	Malagano	4041	3500	86.6	22	14	Piped
	K/Azimio	4567	4000	87.6	24	16	Piped
MILANZI	Milanzi	5213	1000	19.2	14	4	Piped
	Mlanda	6119	6119	100	35	35	Piped
	Nambogo	2151	500	23.2	2	2	Piped
SENGA	Wipanga	2474	2000	80.8	8	8	Bore holes
	*Mponda	1414	0	0	0	0	Natural stream (Mponda)
	Senga	1537	2250		9	9	Piped
	Kankwale	2782	2000	71.9	8	8	Piped
NTENDO	Kanondo	2152	3250		13	13	Piped
	Ntendo	4382	2750	62.8	12	11	Piped
	Luwa	4652	500	10.7	3	2	Bore holes
	Fyengeleza	2139	1000	46.8	4	4	Bore holes
KASENSE	Mtimbwa	4698	500	10.6	3	2	Bore holes
	Kasense	2672	250	9.4	1	1	Natural spring protected
	Chipu	3831	500	13.1	3	2	Natural spring protected
MATANGA	*Matanga	4498	250	5.6	1	1	Bore holes
	Kisumba	3004	0	0	10	0	Natural spring protected
	Chelenganya	2019	250	12.4	13	1	Piped
JUMLA		**87005**	**42668**	**49**	**249**	**185**	

Source: *SMC, Water services Unit, 2014*

2.10.5 Governments initiatives to mitigate water supply environmental challenges.

Replanting of tree species to restore the destructed vegetation during the pipeline construction is one of the measures. Also, construction of durable concrete water catchment structures to control at source erosions, and depositions in water pipes. Observation of environmental laws such as avoiding the crop cultivation and vegetation clearing at water sources to control soil erosions.

2.11 Solid Waste Management

2.11.1 The Nature of Management

The amount of solid waste generated in municipal is about 290 gm/day. The management of solid waste in the municipal has taken from sweeping street and clearing the municipal market. The daily solid waste generated within the municipality is estimated to be 68 tons per day, out of these the domestic waste constitute 30 tones, commercial wastes including wastes from market areas 26 tones street sweeping 4 tons.

2.11.2 Resources used in the Waste management Sector

Now day, the council has a capacity of collecting 38 percent of solid wastes generated, the rest remain uncollected, the main reason is due to lack of solid wastes handling infrastructures. Strategies taken with council to improve solid management, the council already acquired land at Mbalika for construction dump site, purchase 3 trucks and waste collection containers in the financial year 2014/15.

2.11.3 Impact of Waste Mismanagement of the Environment

The shortage of storage bins and refuse collection trucks bring problems for solid waste management in the council, the uncontrolled refuse emits foul smell and tends to be public nuisance. The casual dump areas attract flies, vermin and scavengers. The initial two spread diseases scavengers are prone to communicable diseases.

2.12 Surface Water Drainage Management.

2.12.1 Management characteristics

The effectiveness of the existing surface water drainage system in the Municipality is limited. The common mechanism for drainage is channels/ditches on roadsides. The majority of roads do not have these channels on both sides. There are few existing ones are shallow and poorly maintained. The poor maintenance is attributed to shortage of labour force in the Municipal work department. There is a need to conceive an overall drainage plan for the entire Municipal to improve surface drainage systems. In built up and low lying areas in the Municipal. There is ample land that could accommodate the surface drainage infrastructure.

2.12.2 Impact of Environmental Dynamics on the Surface Drainage System

The shortage of the drainage channels contributes to the failure of containing floor water in the localities including Malangali, Old Sumbawanga and Jangwani. The floor water erodes the road without the side channels in the slopes. In addition, they silt low lying areas and their drainage channels.

2.12.3 Surface Drainage System and Environmental Degradation

The current surface water drainage systems cannot handle flood water effectively. The net effect is that the surface water could overflow and pollute clean water resources in the Municipality. The flood water can wash away fertile soil degrade land for agricultural production.

2.13. Liquid Waste Management and Sanitation

2.13.1 Characteristics

Sanitation and liquid waste management remains a challenging concerned throughout the municipality. A mini survey on liquid waste management facilities observed that the Municipal has no sanitation network system. The municipal society do only depend on two liquid waste emptier trucks; one owned by the Municipal Council (capacity of 8,000 cubic litres), and the other by an environmental stakeholder (Mandela Investments) accommodating capacity of 4,500 litres. These do serve only 62,500 littes from a huge waste water production of 44,500 per day, equivalent to 71.2.percent. These trucks serve do only in areas of proper urban leaving the sub urban areas with questionable challenge.

The study also, observed a big challenge on sanitation facilities at areas with public services and government institutions including Primary and Secondary Schools, Government Health Institutions, Public Markets and Public packing areas. Few public areas and government institutions were sampled and found that only 40.9 per cent of the population at the areas is saved with public toilets. The table 35 below shows a summary of existing situation.

Table 35: Sanitation and Toilet Service at public areas and Government Institutions.

Sn	Public Institution	Needs	Available	Percentage
1	Primary School Students	2084	800	38.4
2	Secondary School Students	489	289	59.1
3	Government Hospitals, Health Centers and Dispensaries,	152	44	28.9
4	Public Market Areas	66	6	9.1
5	Public Packing Areas	28	10	35.7
6	Public Open areas and Gardens	12	8	66.7
	TOTAL	**2831**	**1157**	**40.9**

Source: SMC, Environment and Sanitation, Primary and Secondary Departments, 2014

2.13.2 Liquid waste and Sanitation Management Strategies

The government through Sumbawanga Urban Water Supply and Sanitation Authority (SUWASA) is making necessary arrangements to improve sewage and sanitation services system in the Municipality. The Authority is under construction of the onsite sludge digester at Makutano area. This aims to accommodate sewage disposal from domestic and public septic tanks all over the proper urban though the sanitation system that exists is onsite, consisting of pit latrines to large extent and septic tanks to a lesser extent. Plate 11 describes the ongoing construction of the sludge digester for sanitary control in the municipality.

(a) (b)

Plate 11; (a) and (b) Construction of the sludge digester under SUWASA in sanitary service improvements found at Makutano area in Sumbawanga Ward. **(Source;** Site visit, 2014)

2.14 Mining Activities

2.14.1. Characteristics of Mining Industry

With absence of a comprehensive mineral survey in Municipality, the potential of the Municipality in term of coal deposition at Namwele is not fully exploited to the extent. According to Geologists survey carried by Norwegian geologist (F.Ruden 1988), It is estimated, there is more than five million metric tons of coal deposited. Currently, Emerald, Green tourmaline deposited at Mponda village had started to be exploited in small scale. However, more studies are needed to explore the quantities of minerals that available, hence call for larger investors. The building materials also category of minerals found in council includes; - stones gravel, sand and clay soil.

2.14.2 The Importance of the Mining Activities

Mining for building material provides construction materials for build, road construction and other related construction work within the Municipality. Gravel minerals mined at Mbarika Karasha which owned privately. Mining provides a source of employment to the local community and hence it is a source of earning income. However, the significance of mining sector yet grows for it to be a very potential sector.

2.14.3 Resource Used in the Mining Sector

The main resource of mining activities is land, Aggregates and stones come from rocks where minerals and building material are extracted. Other resource is water; in mining tourmaline for example water is used to separate clay and sand. Biomass energy in the form of firewood is obtained from the Sumbawanga district forestry for provide fuel uses for domestic and commercial purpose.

2.14.4 Impact of Environmental Variables on the Mining Sector

Heavier rainfall like the 1998 ELnino rains can result in floods that disrupt accessibility to some mining and pit filling.

2.14.5 Mining and Environmental Degradation

Mining sector contributes to the depletion of natural resources like minerals and biomass used as fuel wood. It also contributes to pollution and degradation of the environment. Therefore, among other things, mine pits should be made good prior to the abandonment. Deliberate measures should be taken to reclaim the pit and being used for other uses. Use of firewood as fuel in brick making contributes to deforestation, soil erosion and general land degradation.

2.15 Forestry

2.15.1 Characteristics of the Forestry

Sumbawanga Municipal council has occupied an area of 26,343.7 Ha of forest land. This is about 19.8% of Municipality coverage land table 36. There are two main forms of forestry ownership found in the Municipality as follows;- Community and government tenure forms. The community woodlots occupy about 2,876.2 Ha and Central government forestry reserve is only Mbizi Forest Reserve. The government owned reserves which transcend the area of jurisdiction of the Municipality. Mbizi catchment forestry reserve is the only the largest reserve in the Municipality, it covers an areas of 23,467 Ha of forestry reserve. The main fauna is inhabited in forest include;- Red colobus monkey ,leopards, wild pig, reptiles and various birds spp. On other hand, the forested area has about 173 different plant species. There are 25 community natural forest reserves of 22,762 Ha of land that are owned by village governments in the form Joint Forest Management (JFM). Commercial utilization of these resources has not been fully realized due to numerous constraints including lack of adequate financial resources by the local entrepreneurs and poor transport as a result of poor road maintenance

Table 36: Forest planted and conserved in the Municipality

S/No	Forest Name	Area (Ha)	Ownership	% Of the Total Forested Land
Natural tree spices forests				
1	Mbizi Forest Reserve	23,467	Central Government	22
2	Malangali Forest	313	Municipal council	89
3	CBF	2,272	Village councils and Community	16
4	Katandala	0.5	Katandala Vocational Training College	95
	Total	**26,052.5**		
Planted Forest				**222**
1	Tamasenga forest	33	Municipal Council	92
2	Mawenzusi, Tamasenga, Malonje, Matanga na Ntendo forests	161.3	Religious Institutions	17
3	Luwa and Kisumba Forests	6.2	Primary Schools	42
4	Mollo Prison	42	Mollo Prison	25
5	Individual stakeholders	48.7	Individual \Stakeholders	48
	JUMLA	**291.2**		**224**

Source: SMC Social profile 2014

2.15.2 *The Importance of the Forestry*

The contribution of forest to the economy is more than what is reflected in the Council economy as much of the output remains unrecorded and goes to subsistence consumption meeting the basic needs of the rural population. Also many forestry services like erosion control, watershed management, and land improvement are difficult to quantify in monetary term although they are vital for climatic and ecological balance of the district and have a great positive effect on agricultural productivity. Forestry stimulates development for micro industries that need their products from forest such as wood workshops. Forest sector is provided an employment; the Municipality have 69 carpentry workshops' and 15 wood sale centers.

2.15.3 Resource Used in the Forestry Sector

Forest is associated with extensive land- take; it is needed to grow trees in plantation, woodlots, and conservation forms. Another potentiality resource is water. It is needed for successfully trees growth.

2.15.4 Challenges Facing the Forestry Sector

Drought is one condition that affects forestry development. It affects soil moisture contents hence trees become succumb to the extended period of dry season. Another challenge is frequency occurrences of bush fire in the forestry and other vegetation become prone with it.

2.15.5 Contribution of Forestry sector to the Degradation of the Environmental

Forest sector are environmental friendly sector, it is needed to be promoted and developed so as to mitigate Microclimate changes.

2.15.6 Strategies to Improve Forest Sector Development

The sumbawanga Municipal council has taken many strategies to insure forest development and establishment; among the strategies are; to involve various stakeholders e.g NGOs, Institutions, individual and company to initiate their tree nurseries (see plate 12) and eventual establishing woodlots. In Sumbawanga Municipal council, they are 4 active NGO's whose engaged with forestry activities;- RUAECO, KAESO, REMSO REYO. Furthermore, council has emphasized each village to exempt land special for conservation of natural vegetation.

(a) **(b)**

Plate 12: *(a) A tree nursery (Pinus patula) established with Mandela Youth Organization at Mandela area and (b): The community participating in tree planting in Mbizi Forest Reserve owned by the Central Government through TFS (***Source**; SMC, Site visit, 2014)

2.16. Housing and Human Settlements

2.16.1. Characteristics of the Housing in the Municipal

Wards in Sumbawanga Municipality can be categorized as Urban, Mixed and Rural. The urban wards have typical urban development characteristics, mixed wards have both rural and urban characteristics and rural ward possess purely rural development characteristics with such as sparsely housing development (homesteads) and agricultural activities.

Population growth rates in mixed wards is much higher than the urban wards due to additional pull factors in terms of availability of vacant land for housing, urban agriculture including crop production and livestock keeping and other investments. As such the minimum population growth rate for the mixed wards is estimated at 4.4 percent, while the medium is 4.6. Mixed wards usually have high population growth rates than both urban and rural wards. Therefore, as aforementioned, the potentiality of peri-urban areas may push up the population growth rate to a maximum of 4.9 percent per annum. Although, the population growth rate for rural wards in the municipality is low 4.2 percent. Uses of land, as for the year 2013, are presented in table 37.

The spatial expansion is observed in formal and informal urbanization also agriculture activities unlike other land uses. The central area of the town is in trading/business activities. Land use is categorized and described on the basis of area coverage within the planning area proper of Sumbawanga Municipal council (See table 37 below and Figure 3)

Table 37: Existing Main Land Uses for Sumbawanga Municipality 2013

S/N	Land use activity	Area (Sqm)	Area(Ha)
1	Agricultural	68,441,693.6	6,844.2
2	Airport	311,046.1	31.1
3	Commercial Area	578,173.9	57.8
4	Conservation Area	18,196,361.8	1,819.6
5	Hazard Land	10,859,428.3	1,085.9
6	Industrial Area	8,188,970.30	818.9
7	Residential Planned	16,533,332.0	1,653.3
8	Residential Unplanned	15,382,080.2	1,538.2
9	Valleys	23,274,559.5	2,327.5
	Total	**161,765,645.8**	**16,176.6**

Source: SMC, Municipal Social Economic Profile, 2013 and Fieldwork 2013

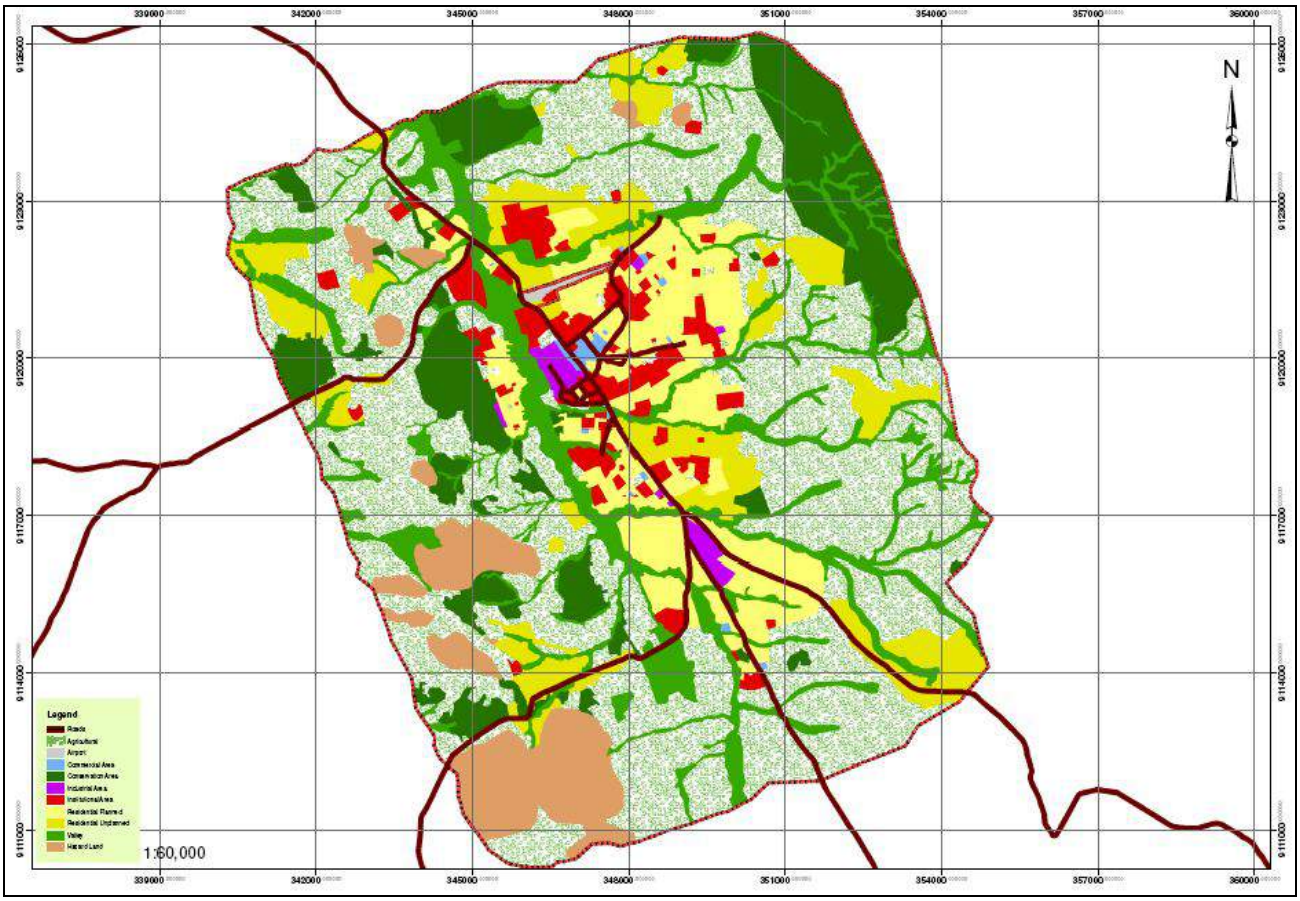


Figure 3: Existing Land use for the year 2014 (**Source:** SMC, Town Planning department, 2014)

Housing development in Sumbawanga can be categories as following; those in arly 1920s, 1960,1990 and 2000 and those built in unplanned location.Houses built in the initial category are found at Sumbawanga and Mazwi, the majority of these residential units were constructed by mud walls. They were built on land that was not formally surveyed and planned. However, old Sumbawanga was planned informally. The houses have or had no basic infrastructures which include;- water synthetic surface drainage.

House in the second category located at Bangwe, Jangwani and Mlangali. They are built in surveyed plots the size of which ranges from 375 -450 M^2. Many of them are built using kilned adobe and roofed with corrugated sheets. These houses have basic infrastructure like road with side ditches water, electricity telephones and septic tanks. House in third category is found mostly in Majengo, Kantalamba OTC, Majumba sita, Kasisiwe, Hali ya hewa, Kantalamba, Mkoani and Kristo mfalme. They are built on surveyed plots which range from 400 -600 M^2. House in fourth category is building in unplanned and un surveyed areas. They are commonly found in peripheral location of the Municipal example; Izia, Katandala, Edeni, Mafulala,Katusa, Chanji and Kizwite. They are diverse in type and design. They are serving with poor physical and social infrastructure.

2.16.2 Human Settlement Development

The planned settlements development had guided with centralized plan where plots are surveyed and allocated to developers who develop them as specified plan. The plots are classified in the following categories High medium and low density or 6:3:1 respectively. The older plots size range from 375 to 450$m^{2,}$ However, The Ministry of Lands and Human settlement Development can revise the standard has

2.16.3 Housing and Settlements and Environmental Degradation

More than 50% of the Municipality is undergoing spontaneous development which features haphazard housing patterns and improper sewage disposal systems. Many of the road in these areas lack road side ditches to drain surface water. This spontaneous development is degrading the environment. Protection and conservation measures have to be taken to intervene in these developments.

2.17 Transport Networks

2.17.1. Characteristics of Transport Networks

Roads network is the predominant access mode of transport in the Municipality as it shares almost 99% of traffic movement. National and Regional road access are marked through parts of Sumbawanga -Tunduma road, Sumbawanga-Mpanda road and Sumbawanga-Kasesya road, from the Municipal centre to its boundaries at Tamasenga, Fyengelezya and Matanga villages respectively. Moreover, according to records from the Civil Engineering Unit, the Municipal council serves 385.55 km of road network; of which 12.97km are tarmac, 24.78 km are gravel and the rest 347.8 km are earth roads.

2.17.2 Transport Sector Development Strategies

International level road standards are observed on the Sumbawanga -Tunduma road, Sumbawanga-Mpanda road and Sumbawanga-Kasesya road which are under international level standards construction. The other 22.85 kilometers are expected to be upgraded to bitumen standard by the end of 2018/19 through ULGSP programme. Plate 13 and figure 4 shows the available government strategies on road transport sector improvement in Sumbawanga Municipality to other parts of the country jurisdiction.

Plate 13:The Sumbawanga-Mpanda-Matai roundabout under the International standards road upgrading of the Sumbawanga-Mpanda and Sumbawanga –Matai/Kasesya marked at Makutano area in Sumbawanga Municipality. (**Source**: Site survey, 2014).

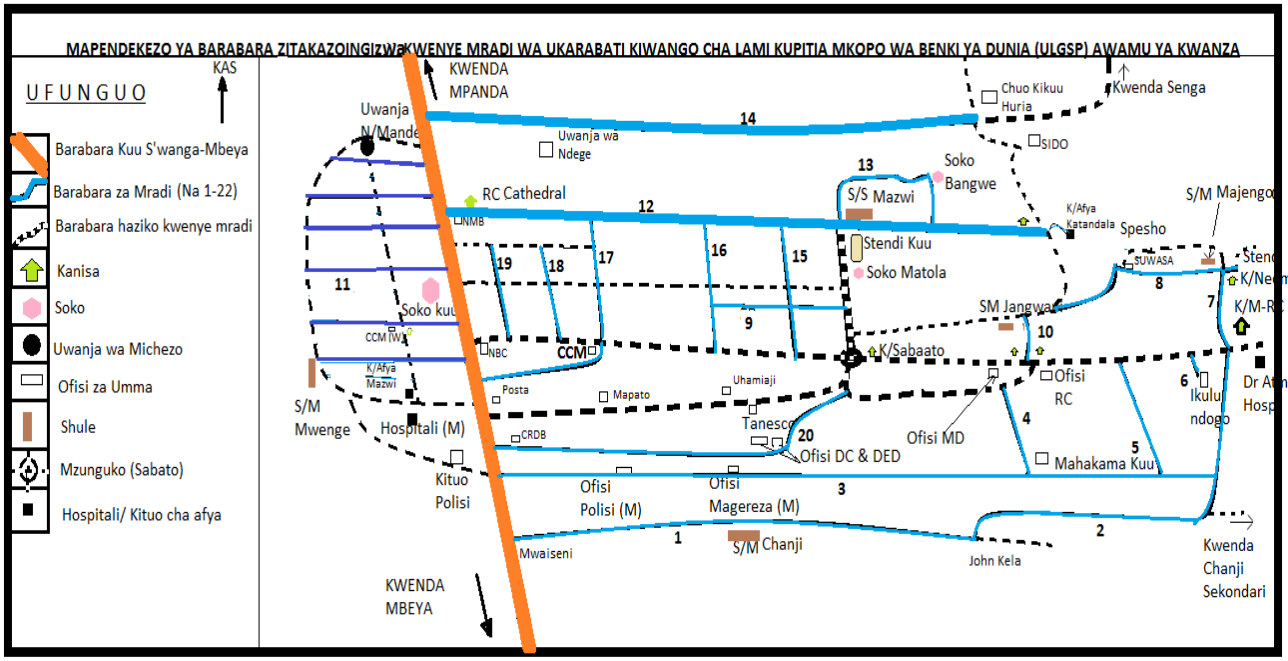


Figure 4: The proposed roads to bitumen standards upgrading through ULGSP in the year 2014.15. (**Source:** SMC, Economics, Planning and statistics Unit, 2014).

2.17.3 Environmental Challenges Facing Transport and Commercial Sector.

Among the environmental challenges in transportation sector include animal trace passing through road infrastructures. Others are running rainy water erosion, sand excavation alongside the road and heavy trucks beyond the allowed tonnage.

(a) (b)

Plate 14: (a) Heavy trucks packing along street roads (b) The resulting effect of heavy trucks packing along street roads as were captured along market street in Mazwi ward. *(**Source;** SMC, Field visit, 2014)*

2.17.4 Contribution of the Transport Sector to Environmental Degradation

The construction, rehabilitation and expansion of transport net work require large amount of construction materials that need to be extracted from the earth. He material required includes;- sands, stones, aggregates', murrum, limes and cements. The extraction weakening the earth and makes it unusable for other land uses. Extensively vegetation clearing is also required for extraction of the material and processing of the infrastructure construction, this action threatening environmental stability.

The use of transport net a work and processing material for road and other infrastructure construction was contributes significantly to air and noise pollution. The problem of air pollution was reported at Crusher in Mbalika which own with Sumry Company, During processing stones and Aggregates is contributing to huge noise from rocks explosion but their extent of pollution is not known. Communities live in the Mbalika and nearest streets were facing the problems of noise and air pollution. Studies are required to determine the extent of its impact to the environment and communities

CHAPTER THREE

THE MUNICIPAL ENVIRONMENTAL SETTING

3.1 Land as a Natural Resource

3.1.1 Land Ownership

All land is Tanzania is public, the land Act No 4 and 5 of 1999 in the constitution of the United Republic of Tanzania grants the incumbent president the final mandate on the use of land in the country. At the region level of Government, respective regional land officer and allocation committee determine the allocation of land on behalf of president.

In the Municipality, the existing land use plan that is based on the practiced uses of the land. The predominant form of ownership at local level is the traditional tenure system. The form of ownership is important in determining the effectiveness of the land use and the control mechanisms.

3.1.2 Land Uses in the Municipality

The preceding sections detail the main sectors to which land is allocated. These are educational intuitional, agriculture, transport, forestry reserve, industries and residence. At present, there is sufficient land to serve needs of the municipal residents.

3.1.3 Land Resource and Competing Interest among the activity Sectors.

Cultivation in the forestland due to continuously expansion farmlands as a result, forests fragment. This contributes to degradation of water catchment zones. In other regions in Tanzania, the geographical expansion of cultivation precipitates land use conflicts. The conflict is not prominent in the municipality at present because land is sufficient to meet varying uses.

The Land Use Commission in ministry of land, Housing and Human settlement Development is assigned with the responsibility to handle conflict related to land uses. There are legal provisions serving that end. These include the Land Acts 4 and 5 of 1999 and Land Dispute Courts Act 2 of 2002.

3.2. Natural and Synthetic Vegetation

3.2.1 The legal Basis and Institution Participating in Managing Vegetation

The natural vegetation in the Municipality comprises of swamps and forest. The swampy vegetation which found in the Municipality is Lwiche. It is characterized by short grass which submerged in the flooded areas It occupies about 13 Ha of the Municipal land. The swampy has rich with fauna include; water bug.

The forest sector has explained detail in proceeding sections of this profile. The council is used the following tools to guide forestry conservation. Those tools are; Forest Ordinance law, Act No 14 of 2002. The council has environmental by law which approved in the 1998. Other tools that guide conservation of vegetation are the National Forestry Policy of the year 1998 and Tanzania National Forestry Programme of 2001- 2010.

The council has three NGO's which participates in the forest management; they are operated in establishments and conservation of forest. These are Rukwa and Environmental Youth Organization (REYO) Rukwa Agricultural and Environmental Conservation (RUAECO) Kaengesa, Environmental
Conservation Society (KAESO), Tanzania Forest Services (TFS). The groups have produced 450,349 various tree species which will facilitates to a forestation and reforestation in rural and urban areas in the year 2015.

3.2.2 General Contributions of Vegetation to activity Sectors

Forest sector is very potential for produce construction materials like timber, building poles and Sources of fuel woods; charcoal and firewood which serve domestic energy source, another potentiality are climatic regulation, maintain soil fertility and control soil erosion.

3.2.3 Impact of Activity Sectors in Vegetation.

Extractive activities in Sumbawanga contribute to deforestation. These include cutting trees for domestic fuel need and construction material, and clearing for farm expansion.Secondly, intensive land uses contribute depletion of vegetation cover and soil degradation. The depletion of forest degrades water catchments. Thirdly the depletion of natural vegetation in areas such as Mollo and Kasense wards has led to the loss of the natural beauty in the municipality. Finally the clearance of vegetation interferes with relationship between organisms and between organisms and the a biotic environment inhabitant. The disruption of the relationship endangers the life of organisms in the habitant and change the function of ecosystem. An example of latter is the abrupt change amount and distribution of rainfall in the municipal resulting from reducing transpiration following vegetation clearance

3.2.4 Competing Interest between the Activity Sectors and Conservation of Natural Vegetation

One set of competing interests is between agricultural and forestlands. Farm expansion, which is characteristics in the municipal, encroaches forestland. These are largely due to shifting cultivation by millet farmers. The farmers seek for fresh land once they have exhausted that under use. Pastoralist contributes to the problem in the similar manner.

Another set of competing uses is that of urban development and natural vegetation reserves. Urban development is essential. New residences transport and industry infrastructure are constructed in the urban environment. This development often comes at price of natural vegetation which needs to be cleared to claim space for urban development. Urban development is party attributed to rapid population increase. In addition, vegetation is depleted to serve needs in the increasing population in urban areas.

The third set is that of wood fuel versus forestry conservation and development. The population of Sumbawanga increases at a rate of more than 3.4% per annum. There is an exponential increase in the demand for fuel wood. These result in fuel wood consumption beyond the forest replacement, which is adverse to the development of forest.

3.2.5 Conflict Mediation through Management Arrangement

- There is a need to demarcate forest reserve boundaries, for example Mbizi, Malangali and community natural forest reserve. These help to control encroachment.
- Influence communities to adapt agro forestry practices to simultaneously replace trees cleared during farm expansion and provide fodder to feed livestock.
- Implement tree planting schemes in both rural and urban area. Tree species that produce more fuel wood and timber should be prioritized in the schemes.
- Construction of firebreaks to control the spread of fire within forest reserve and woodlots.
- Plan and implement guard patrols to reinforce forest protection

3.3 Energy Resources

3.3.1 Energy Use

The predominant sources of energy in the municipality are fuel wood, charcoal, and electricity. Sumbawanga has 20 households that use biogas to meet domestic energy requirements. These are located in Kizwite wards. Solar and coal energy might be used in some households, but information documenting these alternative is not credible.

3.3.2 Other Activity Sectors and Utilizes Energy and Mineral Resources

Energy is used in the manufacturing, transport, and communication. For example, it is used to transport building material, coal, and emeralds from emeralds from mining to marketing and consumption centres.

3.4 Nature for Recreations

3.4.1 Characteristic of Natural Recreation areas

The Municipality has a number of nature sites for recreation. These include;- Mbizi Natural forestry Reserve and Mandela Stadium. Many people, especially school students use the centres for picnics. The nature centre has diverse biodiversity, which includes endemic species such as the red colobus monkeys and the swamp water bug. They are attractive for tourism. However, tourism and recreation are not (well) developed. There is a need to attract people to these centres by providing the facilities needed to utilize the centres.

3.4.2 The Environmental Impact of Utilizing the Nature Centers

There is the risk visitors might contaminate the nature sites and recreation centers one reason of this is the lack of mechanisms including toilet and wastes bins. The other is the popular attitude of prioritizing things other the environmental good

3.4.3 Competing Interests between Nature and Recreation and other activity Sector

Centers of nature and recreation occupy space that could be rewarding for other uses, which include residence and business centers. The conservation of nature centers may require buffer zones, which may take ample land space. This could aggravate pressure on land and land use conflicts in the municipal in the future. There is the need for current and future municipal land use plans to priorities the allocation of open spaces for pro-environmental uses this may includes sports fields and gardens. This is a requisite in most modern urban plans in most of the developed countries.

3.5 Surface Water

3.5.1 Nature and Source of Surface water

Surface water includes rivers and streams. Rain water, the source of the most of the surface water, result partly into surface runoff. Some of the water infiltrates into the soil. The soil water percolates through unsaturated layers to form water table. The source of the water used in Sumbawanga is valley of Lwiche and Mbizi forest. The sources of the water are the confluence of surface and underground water at the source. The water saves the urban and perturbs areas of Sumbawanga. The water gravitates into the municipality through Katuka intake in Kasense and Matanga wards.

To date, 6000m cubic of water are produced per day during the rainy season and 2000m cubic during the dry season for the municipality. Thirty percent of the inhabitants of Sumbawanga get water from the water pipe distribution network. The rest draw water directly from adjacent rivers and streams. Piped water is chlorinated and purified a treatment plant in at Majengo locality in the municipal. The water distribution pipe network in the municipality is about 30% and 70% of the total population draws water from surrounding rivers and streams. Also water treated in the treatment plant situated at Majengo area for water settlement and chlorination. Several localities such as Kizwite do not receive treated water, and so it is not safe for drinking

Water harvesting is a common activity in Sumbawanga as it is in many regions in Tanzania during the rainy season. People collect water in residence and within institutions. In the domestic sphere, people in many residences use rudimentary method to harvest the water. These include taping water falling off roofs into household utensils. A few residences sport gutters that collect water efficiently. However, water storage is usually not efficient. Most houses lack storage tanks that could as well be used to treat water domestically. The quality of water is subject to that o the storage facilities.

Institutions that harvest rain water in Sumbawanga include the Catholic Mission and Mother and child health centre. Compared to the domestic water harvesting system, that within the institution is more efficient. Roofs feature gutters, and the harvested water is stored in tanks or similar containers. Its quality is arguably higher than that harvested within homes

3.5.2 Usage of Surface Water as a Resource

In Sumbawanga, surface water largely serves domestic needs, which include drinking, cooking, laundry, and general cleanliness. In addition, water is used in irrigation, as is the case in the wards of Milanzi and Kizwite. The water is used in industry and commercial activities as well. However its use in these sectors is limited compared to the domestic need.

3.5.3 The Impact of Maintaining Water Supply on Other Activity Sectors

Sustainability the availability of surface water and (to lesser extent) rainwater can potentially conflict with other land uses in Sumbawanga. In the process is conserving water catchment areas and limiting their exploitation to serve other needs. This increases pressure on other land uses. In addition, there might be a need to curb uses such as mining and quarrying in a given area to protect underground water. However, conflict land uses involving protecting catchments may not be a problem at present because population pressure is not critical. In the future, it could be, given the high rate of population growth rate in the municipality.

Secondly, pressure on surface water resources is especially pronounced during the dry season, when water supply is limited. Pressure increases on water sources to serve domestic and crop cultivation needs. Irrigation is usefully in dry season because root crops and vegetables cannot sustain without it. In addition, the demand for the greens is higher during this season.

Finally, there is a conflict between domestic uses and animal husbandry. Domestic consumption of water increases with increasing needs, partly contributed to by increasing population and changing life styles. On the other hand, the practices of zero grazing cattle and domesticating poultry require considerable water usage. These circumstance increases pressure on water sources

3.5.4 Management Actions on Control Conflicts Related to Surface Water Usage

To date, not much has been documented to shoe practical management of conflicts relating to the usage of the usage of surface water. However the urban water supply and sewage Authority is concerned about the usage of surface water. The water department in sumbawanga is concerned with surface water resources in rural and per urban areas in the municipality the as well. Being concerned is an initial step toward active management. The water sub –Basin Office (WBO) in Rukwa region controls surface water usage and protects water sources

3.6 Underground water

3.6.1 Nature and Use

Water stored underground largely results from percolation of surface water through porous soil layers. The water can be accessed by digging wells. Underground water is used mainly to serve domestic needs in Sumbawanga. It is as well used in agriculture, but to a limited extent. There are no data to quantify the supply of underground water. There are shallow and deep wells in the municipality having a depth of 60 meters and more. Table 38 lists the number deep well in the municipality.

Table 38: Deep wells in the municipality

Location	Number
Fyengerezya	3
Ntendo	8
Ulinji	4
Isesa	13

Source; SMC, Water Service Department, 2014

3.6.2 Environmental Impact of other Land Uses on Underground Water

Pit latrines, septic tanks, and subsurface sewage disposal, characteristics of the urban and per urban environment in Sumbawanga municipality, may threaten the quality of underground water. In particular, the sewage management system in the upland may compromise the underground water in the low land. Beside the sewage systems, insecticides and chemical fertilizers that are commonly used in family can seep through the ground and contaminate the underground water reservoirs.

Whereas underground water is to be conserved, it conflict with agricultural activities in catchment areas which are motivated availability of water for irrigation, land fertility, availability of green pasture and abundance of trees for building purposes. Sanitary activities near underground water sources conflict with water supply activity. There is no documentation of explicit management arrangements to conserve and protect underground water, and manage conflict with other land uses.

3.7 Historical Site and Cultural Heritage

3.7.1 Natural of Historical Sites and Cultural Heritage

There are few places of historical interest in the municipality. These include that sporting belongings of the ethnic chief who lived in Milanzi. The sites are 8 km away from the municipal centre. Another item of interest is the grave of Chief Mwene Milanzi. In addition, there exists a cave that was used to warship in traditional religions. There are remnants of traditional weapons of the Fipa tribal as well

The older party of Sumbawanga urban centre features ruins of the great building in which chief Ngalu lived. These was built during the German colonial era. There are remains of traditional iron smelting kilns in the villages including Milanzi, King'ombe A, Katumba azimio Kaloleni

There are ethnic songs still sang in various occasions in the municipality. Different kind of are sung during different events, such as during cultivation, hunting, worshiping, and wedding. The songs are also sung during special circumstances such as reconciliation and counseling. Songs and ethnic art vary among the ethnic groups of Fipa, Nyiha, Konongo, Chaga, Sukuma, Nyakyusa, Nyamwanga , and other minority groups, all of which are found in the municipality.

3.7.2 Prominence of Cultural Heritage in other activities

The ethnic history and practices is evident in education and provides employment opportunities. Visitations to the historical sites are included in academic activities of school in the municipality. For example 52 students from schools within the municipality made tours to the historical sites in the past. Historical sites stimulate small scale trading enterprises. A considerable number of local people provide utilities to people visiting the historical sites. To consolidate income bases, local people, who are vested with knowledge of the historical sites could serve as guides to visitors and get paid in the process.

3.7.3 The Impact of Other Activities Sectors on the Historical Sites and Cultural Heritage

Historical sites are a source of income and educational value when used as centers of attraction. In due course they could be vulnerable to environment al contamination. People litter them with food leftovers and other garbage. They often trample over the environment and could disrupt the arrangement and nature of the sites. Such conditions need to be controlled to maintain and quality of the sites.

3.7.4 Conflicting Interests between Historical Sites with Other Land Uses and Management

No significant conflicting interests have been acknowledge between the presence and use of the centers
Of historical centers and other activities sectors. Management arrangements to address conflicts are therefore not of high priority at the moment.

3.8 Air

3.8.1 Characteristics of the Resource

Wind blow from east during November-April and from north-east during may-October with an average speed of 10-20 knots per hour. During dry season, may-November, winds blow at higher speed and are often accompanied by storms of dusts. During the rainy season, the winds are weaker and are sometimes accompanied by thunderstorms which may destroy houses and farms. The municipality is situated on undulated land that is surrounded by hills. Its geographical location makes it sensitive to air pollution. During the dry and hot season in the year, many people suffer from the air pollution. The good tree cover all over the municipality helps to cleanse the air and provide shade

3.8.2 The Nature of Degrading Air Quality in The Municipality

The quality of air has degraded during the last ten years in the municipality. There has been gradual but persistent increase of its contamination. The main causes of air pollution are processing, manufacturing, and service industries. For example, the continuous use and inadequate cleanliness of the abattoir causes strong and repulsive smell.

To date, smoke and fumes from motorized transport contributed most to air pollution in the municipality. This threatens air quality in the municipal is not as bad as is in cities such as Dar es Salaam or Mwanza. However, it is deterioting gradually but steadily. The precise contribution of transport sector to the wide air pollution is difficult to determine. If no intervention measures are taken, the deteriorating quality of air might become a major threat to the municipal dwellers. During the dry season air polluted by dust blown by strong winds. Treeless or denuded areas are the most affected in the municipality

The ineffectectual waste management system contributes to air pollution in the municipality. The municipal streets exhibit uncollected solid and liquid waste. The efforts of Sumbawanga Municipal Council, which deals with waste management, are not sufficient. The uncollected waste decomposes and emits repulsive odors'. Some solid waste is incinerated or used for energy. For example, cereals' chaff is used to burn bricks in kilns. However, the methods of incineration are improper. It is undertaken within neighborhoods and results in plumes of smoke. People often complain of air pollution caused by smoke.

3.8.3 Activity Sectors Impact on the Air

Some of the activities people engage in infringe the quality of air. These include small-scale workshop/enterprises pose a very big problem to air quality. There are competing interests of housing sector against the enterprises sector in which economic activities like carpentry and grain milling are under taken in residential areas. The sectors do not have modern technology to purify or treat their by product. Residents complain about specific small scale activities causing some kind if air pollution

Secondly there are conflicts between vehicles using gravel and earth roads and housing sector. Dust emanating from the roads affects people living along the roads in question. Thirdly there is conflict between waste incineration and discharge of liquid waste. Municipal residents living around the central business district and industrial areas have not complained about the air pollution caused by burning of solid waste and liquid waste discharging. However it is evident from the amount and way the waste is burnt that the fumes are very dangerous for human health. The fumes can be smelt in the areas near or surrounding of fumes region and on the leeward side of the wind direction.

Fourthly, there is foul smell emanating from the abattoir especially in Mazwi area. During windy days foul smell can be smelt as far as Mazwi. There is no specific management or non-organization which deals with conflicts over the air resource.

3.9 Environmental Hazards and Threats to Environmental Health

3.9.1 Characteristics of threats

Environmental health refers to keeping environmental surrounding clean such that communities are not affected by health hazards given the healthy sanitary condition of the environment. In the municipality, residents in 8 wards live in dilapidated houses and have limited access to basic social services such as clean and safe water, and efficient disposal system for both liquid and solid waste. These areas are susceptible to high incidences of health problems, including occurrence malaria, typhod fever, cholera, and diarrhea. Between February and April 2007, there was an outbreak of cholera in 4 out of 13 wards in the municipality. Two out of twenty-five patients died

The number of Malaria cases treated in the Sumbawanga Regional and Dr. Atman hospital, health centers, and dispensary has been increasing over time For example, there were 4369 reported Malaria cases and 54328 in 2006. More finds are needed to purchase drugs to treat patients with. Poor health heavily on economic performance in the municipality.

3.9.2 The Influence of activity Sectors on Environmental Health

For many years now, the sanitary conditions of Sumbawanga municipality has been deteriorating steadily. The main causes include improper disposal of liquid and solid wastes, lack of reliable and safe water supply, inefficient storm water drainage systems and existence of dilapidated buildings.

The environmental health deficiencies have contributed to air pollution in residential areas. The urban development activities that deface the earth become breading sites for mosquitoes and other insects, which transmit diseases between and among people. About 90% of hospital waste is not well managed. It is collected and dumped together with other waste in the open dump in the outskirts of the municipality. This degrades the quality of land, underground water and air.

About 30% of built-up environment in the urban proper has ground water table at an average of 1m under the ground. About 70% of the pit latrines in the municipality overflow during rainy seasons and contaminate ground and surface water. In March, 2013 two water samples were taken from shallow wells in several wells and the result showed fiscal contamination in the samples. Contamination is greater in wells constructed 30m from the latrines.

3.9.3 Existing Managerial Arrangements

The department of Environment and Cleansing, Health, Works, Town planning and SUWASA are working hard in their duties and responsibilities in reducing threats to the environmental health. At a ward level, there are primary health care committees, of which their activeness is limited.

3.10 Pollution

3.10.1 Characteristic of Pollution

The Municipal environment has different types of pollutions including water, air, noises and soil resources, and the pollutions originate from different urban development activities in the area. Air pollution originates from smokes from burning of solid wastes such as saw dusts from carpentry works and rice husks, and wild fires where. Another source of air pollution is the fuel combustions in motor trucks, milling machines and municipal waste decompositions. The gases produced include Carbon dioxide ($CO_{2)}$, Ammonia ($NOH_{2)}$, Methane (CH_4) contributing to greenhouse gas effects and bad odor to municipal premises.

Most of liquid and solid wastes from abattoir, industries, domestic latrines and other private commercial sites are released in water systems without being treated attracting flies and other potential disease vector and vermin. Noise pollution from motor vehicles, small scale industries and night clubs is also a concern environmental pollutant in the Municipality. Soil pollution is also been an alarming issue caused by the continuous and over use of chemical fertilizers and insecticide leading to imbalance of soil pH.

3.10.2 The Impact of Pollution on Activity Sectors

The extensive use of pesticides and chemical fertilizer in urban agriculture cause water pollution. Water sources which found at Lwiche River and 14 rural water sources are experiences with this problem.

High degree of soil alkalinity or acidity resulting from uses of agricultural chemicals contaminates some of the crops and vegetables products grown in Municipality. Hence it is contributing to health problems among agricultural products consumers.

3.10.3 The Influence of Activity Sectors

The industrial activities contribute to environmental pollution through improper disposal of untreated waste or by products generated by them. Dust pollution generated with rice milling machines common at Katandala areas. In due course the waste and by products become hazardous to the people and environment.

Transport and communication were contributing to air pollution. Obnoxious fumes emitted by motor vehicles contaminate the atmosphere and could be hazardous to Municipal resident.

Liquid wastes which are not properly managed in Municipality, In council there are no proper solid waste collection points set for that purpose, uncontrolled decomposing wastes pollute the soil and air. Liquid wastes contribute to block sewers cause waste to overflow. This is leaking effluents from commercial, industrial and residential areas contaminate the environment. This mismanaged waste emits repulsive odour and attracts flies, subsequently health problems.

3.10.4 Conflict of interests between Activity Sectors on Pollution

Whereas the urban dwellers living adjacent to sewer system and oxidation ponds are disturbed by foul smells. Applications of agricultural chemicals are contributing changes in acidic condition (Ph) in the soil.

3.11 Deforestation

3.11.1 Characteristic of deforestation

About 98 percent of Municipality households are depending upon wood fuels for domestic uses, hence, about 10 hectares of forest are harvested every year due to extraction of wood fuel. Another factor which contributes to deforestation was expansion of agricultural land. In the Municipality deforestation is evident in Itwelele, Malonje, Kansese and Muva Forest plantation is experiencing to deforestation

3.11.2 Impact of Deforestation on activity Sector

Deforestation causes the depletion of soil nutrients. Deforested areas are susceptible to extensive erosion and soil become poor to farm on. In addition the trade in forest products suffers because the supply dwindles with increases deforestation.

3.11.3 The influence of Activity Sector on Deforestation

The main factor that contributes to deforestation is unsustainable agriculture. In the council many people have practiced shifting cultivation methods. This system had required large tracts of land, as a result, people tend to clear and burnt forest areas in order to get new fertile land, this is commonly adopted to millet and maize crops.

Construction and expansion of roads, houses, and telecommunication towers infrastructure require forest products to build. In addition, vegetation is cleared to make way for some of these infrastructures. For example during the installation of KV 66 power lines in 1999-2000 from Mbala to Sumbawanga, many trees had to be cleared to make way for it.

The commercial activities that involve forest products such as carpentry, wood fuels, and timber sales promote deforestation. Such commercial activities are common in the Municipal.

3.11.4 Managerial arrangements to Address Deforestation

There are strategies to promote communal and individual woodlots in all 25 villages of Municipality and village participatory natural forestry management. The activities are coordinated through joint forest management practices [JFM].

There is regional environment conservation and trees planting programme known as 'Hifadhi Mazingira Panda Miti Rukwa' [HIMA -PAMIRU]. It encourages community participation in environmental conservation especially in tree planting.

3.12 Siltation in the Municipal

3.12.1 Introduction activity Sectors

Siltation is accumulation of sand and mud caused by surface water runoff during rainy season. The eroded materials are carried down to low lying areas by the running water. In sumbawanga municipality, flooding does sometimes cause siltation. The silt is deposited in the drainage channels along the road sides and on the mouth of rivers and dams. Lwiche valley is the most affected area in municipality.

3.12.2 The Impact of Siltation on activity Sectors

Siltation can annihilate infrastructure. During rainy season, sand soil, and solid waste are washed from uplands and deposited on low lying areas and storms water drainage channels. The drainage channels and culverts get blocked or are destroyed. Running water overflows onto roads and degrades them. Roads are affected by accumulation of sand and silt. They become slippery. For safety, they have to be removed. Siltation affects housing and settlement. Once drainage channels become blocked by silt, runoff water overflows to adjacent settlements and buildings. The housing foundation deteriorates in this manner, and their stability is compromised. Siltation has both positive and negative effects on urban agriculture. On one hand the deposited materials compromising of sand, alluvial soil, and solid wastes is fertile and suitable to cultivate on. On the other the low land are susceptible to non point pollution if agrochemicals used in uplands are transported and deposited there. This can cause soil pollution, which contributes to the imbalance of soil PH.

Siltation causes pit latrines and other on sites sanitation facilities to get filled with soil and mud. Their depth is thus reduced. This requires frequent dislodging and emptying. Although the impacts of siltation on mining activities are minimal, they are worth mentioning. Silt fills miningpits, and thus inconveniences mining activities.

3.12.3 Influence of Activity Sectors on Siltation

Clearance of forests loosens soil and exposes it to agents of denudation. The soil are easily eroded and washed away by surface water. The soil combines with other materials and is transported to low lying areas.

Agriculture activities involve vegetation clearing and tilling land. The loosened soils are washed away during rain showers and transported to low lying areas.

Livestock can aggravate siltation. Overgrazing damages soil structure and loosens it. During the rain showers, the loosen soil is washed away by water and deposited on low lying areas.

The construction of buildings involves the clearance, which includes removal of vegetation cover. This loosens soil, which are washed away and deposited in the lowlands and in the drainage channels. If the drainage channels are properly constructed and regularly cleaned, siltation can be minimized.

3.12.4 Conflicting Interests between Activity Sectors over siltation

Agriculture activities cannot be done properly without clearing and tilling the land. This causes the soil to loosen and get washed way. The area deposited with the eroded material is usual fertile and produce greater yield when cultivated. On the other hand, construction of buildings requires sand and silt are the some of building materials. These are abundant in the low lands that have been deposited with them. The need for these materials may conflicts with agriculture activities in the low lands.

3.12.5 Managerial Arrangement to mitigate silting

So far there no managerial arrangements to curb the siltation problems save for the health departments under the municipal council. The department has been trying to manage storm water drainage.

3.13 Fire Hazards

3.13.1 The Nature of Fire hazards

Fire is useful to humans, however if used without caution, it could be hazardous. The Municipality had many incidents of fire out breaks in 2007. About 30percent of grasslands and forests are burnt every year. This happens mostly during the dry seasons. The source of fire in the reported cases includes those from within residences and commercial centers and those started deliberately in forests and grasslands. The following cases exemplify the former. In 2006, the Sumry enterprises shopping centre with its entire stock was completely burnt. In another case, three trading rooms in Kiwelu Street were scorched. This fire burnt three residential houses as well. The fire in forest and grassland are started by hunters, charcoal makers, and those clearing farms.

Table 39: Reported cases of fire occurrence in Municipal in 2003-2006

Year	2003	2004	2005	2006
Cases	31	28	40	32

3.13.2 The Impact of fire hazards on activity sectors

Fire set in grasslands, forests, and catchment areas affect organisms, destroy biodiversity and dries moisture content in the soil. This causes unbalances in ecosystem Secondly, fire outbreaks in residential and commercial centre because loss of property and sometimes life Thirdly, frequent fire on land affect annihilate farm crops, soil structure and cause soil infertility. Furthermore, the energy and communication sectors can be adversely affected for example, fires may damage transmission poles.

3.13.3 Activity sector as a source of fire hazards

The incineration of waste may result into fire outbreaks if improperly managed. This can result into property loss and damage to the environment. Windy climate in the Municipal may aggravate instances of accident fire outbreaks. Domestic activities such as cooking and usage of electrical appliances may be causes of accidental fire outbreaks as well.

3.13.4 Competing interests between activity sectors in the uses of fire

There is conflict between farmers and foresters toward on whether to use or not to use fire in their activities. Many farmers use fire during farm preparations. On the other hand, forestry conservation ordinance chapter 135 of 1953 prohibits setting fire to the forest grassland and related areas.

Secondly, fire is a source of energy used in commercial and domestic spheres. However, if improperly used it become a hazard because it can destroy property if uncontrolled.

3.13.5 Managerial arrangements to deal with fire occurrences

The Municipal council has five units which were formed to contain fire outbreaks and educate communities on issues related to them.

3.14 Floods

3.14.1 Nature of flooding in the Municipality

A flood is rising and overflowing of water which covers land usually not under water. The configuration of land surface includes its relief and the position of its natural and manmade features that play part in the process in flooding. The Municipality is found at an elevation altitude (5962) feet a.s.l) at this altitude floods do not usually happen.

From meteorological point of view floods occur when river banks cannot contain certain amounts of water. Excess flows of water were forced to overflow beyond the banks. The river, streams and valley traversing throughout the town are potential catchment areas for floods. The areas in the Municipality which have most faced with floods are;- Malangali, Jangwani (Katandala). The potential flood points in the Municipality are neglected. The drain contributed to affect the effectiveness of efficiently working and some of built up areas have insufficiently capacity to cope with the additional water flows during heavy rains.

3.14.2 The influence of activity sectors on flooding

Water courses such as natural stream are very important for evacuating flooded on low lying areas known of outfall points. However, housing sometimes blocks natural steams and constrict the flow of floods. This aggravates floods. The solution to this applies management options in Municipal drain drainage system not on a limited area.

3.14.3 Conflict of interest between the activity sectors with respect to floods

Settlement developed in low – laying areas prone to flooding is affected by negative environmental impact of them. However, agricultural sector benefits from flooding because of soil fertility compounded by the deposition of fertility soil in the lowland.

3.15 Droughts

3.15.1Characteristics of droughts on activity sectors

The municipality receives annual rainfall ranging 800-1000mm of rainfall per annual. The highest record of 1010.6mm has been recorded in Katumba village. There are two zones of rainfall in municipality. One is southern and south east zones, which receives has rainfall of over 900mm per annum. The other is the Northern and central part, which receives moderate rainfall of 800-900mm per annum.

3.15.2 Impact of drought on activity sector

According to some resources persons, the municipality experienced drought in 1944 and 1978. During then, the municipality experienced low yield of maize and cassava, the staple food crops. The government helps to give out part of the nation stock of maize or transport them from other regions to the municipal to meet the deficiency. During the time, the water sources were depleted. The housing sector was as well affected because water was too limited to be available for construction.

3.15.3 Conflicting interests of activity sector with regards to drought

Farmers need virgin land to cultivate in subsistence farming, which is predominant in the municipality. During every farming season they clear forest to reclaim new farm areas. In doing so, they reduce natural vegetation cover and increases the evaporation of ground water sources.

3.15.4 The influence of activity sectors on drought

There has been no particular study undertaken to substantiate the relationship between activities sectors like uncontrolled trees cutting and urban agriculture and drought of 1944 and 1978,even though forest are used extensively in the Municipal as the drought condition experienced nationwide.

3.15.5 Management arrangement to manage drought

The natural resources department in the Municipality undertaken forest management practices carried out through educative patrols, tree planting and fire control.

3.16 Wind

3.16.1 Characteristics of wind condition in the Municipality

Strong wind occurs during the dry season between may and November. This is because of different daily temperature between areas upland and low lying areas. Dust storms are associated with the wind and are strong during the afternoon hours between 2 and 5pm. During these times, the uplands areas become warm and low lying ones cooler. Fog and cold air settle in low land, where the air circulation is less than it is in the uplands. The wind blows from the north. The blow strongly to the extent they fell trees.

Trees fall over a large area, and these promotes house construction in the areas cleared by the wind. Mazwi and old sumbawanga are case in point. However, the existing trees deflect and filter and reduce wind speed. Wind storms occur during rain season. They are usual accompanied with rainfall, tremors, and thunderstorms. Wind storms blow building rooftops, destroy crops, drop tree branches and damages telephone and electrical transmission systems. They also impose danger to human life.

3.16.2 Impact of winds on activity sector

Wind affects the housing sector they blow of roof tops of many houses almost every year. In 1998, for example, heavy rainfall with strong winds blew off the roof of Katandala A anb B primary schools. These affected the academic activities in school devastations in the residences disorient the affected. People face hardship in term of cost recovery. In some cases the damage causes injuries to people.

Dusts storms affect solid waste management. The stored in collection point is blowing of and speeds over. Wind accelerates crops-pollution and is an agent of soil erosion. Dust storms and strong wind accelerate fire breaks. Fire used in farms preparation can be to bushes and forest by storms dusts. The fire damages fauna, and ecosystem. Strong wind speed is contributing to borne diseases such as tuberculosis, influenza [flu], and eye infections.

The agriculture sector is affected by wind hazard. Strong wind blows causes lose top soil, which are usually the fertile and leave bare grounds without fertility. Maize and sun flowers are more susceptible to strong wind. Strong wind affects telecommunication and energy sector they drop trees or their branches and these disrupt the transmission line when they fall on these disrupt communication and power supplies.

3.16.3 The influence of activity sectors on wind

Mining activities contributes to dust storms. The wind that blows over mining sites picks up dusts and blows it to other place. Agriculture activities accelerate dust storms as well. These are mostly the case during the dry season after the farms have been harvested. The wind passing over the harvested farms pick lose soil and scatters then in other areas. Trees act as wind breakers. The in discriminate filling of trees accelerates wind movement in areas without trees, thus heightening the distractive effects of the wind. There is no direct management arrangement to mitigate the impact of wind in the municipality. There is no existing arrangement management which deals with wind with impact.

CHAPTER FOUR

THE MUNICIPAL MANAGEMENT SETTING

4.1 Introduction

The management setting includes stakeholder institution in the management and development of the municipal. The institution includes the public and popular and private sector and community based groups.

4.1.1 Public administration institutions (Central and Local Government)

These are the president and vice president offices, the prime minister's office, Region administration and local government, Ministries of finance, land, Housing and human settlement development, Natural resources and tourisms, water, Energy and minerals, Infrastructure and local government

The president offices have constitution powers to oversee the development sectors at both local and national level. The ministry of economic planning and empowerment is under the presidents' office is not responsible for macro level recourse allocation. The Tanzania investment center (TIC), Responsible of all strategic investment in the country is also under the president's office.

The office of vice present has the power to take charge of all environmental affairs in the country. The division of environmental under the director of environment and the national environmental management council are implementing. The aims of environmental management in the country under the vice president. The director and the council have the responsibility to advice the government and other stakeholder on environment sustainability.

The prime minister's office has a ministry dealing with the Regional Administration and Local Government. It has the prime responsibility of co-coordinating local government activities in the urban areas including general policy guidance. The ministry administers regional secretariats as well as urban authorities support unit in the sector coordinating the division of the office. It co-ordinates the national framework for Urban Local Government Strengthening Programmed

Following endorsement of the national budget by the parliament, the ministry of Finance disburses the government development funds (LGCDG) and Urban Local Government Strengthening Programmed ULGSP grants. It also administers the recurrent budget.

The ministry of Vice President is responsible for management for all environmental issues concerned in formulation and implementations of sustainable development plans and programme's. While Land, Housing, and Human Settlements Development is responsible for land use planning and human settlement in the country. Its core functions include policy development, general guidance of national housing, urban land use planning and development, central mapping, regional physical planning, land development, surveys, valuation, land registration, and research, in discharging its mandate, a number of laws have been enacted. These include the land act no 4 and 5 of 1999, and the country and town planning ordinance cap 378 of 1956 and The National Environmental Management No 20 Act of 2004(EMA) The letter is currently being amended. Other is the land survey ordinance building regulations, housing policies, land policy, and human settlement development policy.

The new National Housing Corporation, which is under the auspices of the ministry, is responsible for supplying, letting, and maintaining the public housing stock. The ministry is as well supported by the national land use planning commission, which advise the government and other developers on matters related to sustainable land uses.

The ministries of Natural Resources and Tourism are the custodian of policies relating to natural resources and tourism. The management of forest and beekeeping fall under its mandate.

The Ministry of water deals with all issues relating to water planning and management in rural and urban and rural setting. It formulate water policy. It also deals with sewage and drainage, water supplies, undergroung water resources, dam constructions, management of river basins, water pollution, quality control, and water boards. The 19 Urban water and Sewage Authorities established in each of the major urban centre in Tanzania are accountable to the Ministry of water

The ministries of Energy and Minerals has the mandate to administer the energy and minerals policies. The ministry's portfolio includes urban and rural electricity programmed, and geographical and geographical surveys.

The Ministry of Infrastructure is responsible for the policy of construction and its management, public works, building standard and construction, roads, bridges, and the standard and quality of construction. It is also responsible for planning and development of the communication and transport sector in collaboration with Tanzania Harbors Authority, Tanzania Railway Authority, Postal corporation, and Tanzania Telecommunication company limited.

In the case of Sumbawanga, the municipal council as part of the local government has municipal development sectors managed by the Sumbawanga Municipal Council 15 councilors elected from 15 wards. Other councilors are nominated from the women groups in the municipality. The council leader is the mayor, elected among the councilors. The council operates through a committee system, which is under the guidance of local government urban authorities' act of 1982. The act empowers the council to pass by laws. The chief executive of the council is the Municipal Director, assisted by Heads of Departments.

Besides the central and local government institutions, the private sector stakeholders are the Tanzania Chamber of Commerce, and the Industry and Agriculture –Rukwa Region Branch. These represent the numerous formal private sectors operators at individual firms engaged in commerce, industries, and agriculture.

The popular sectors includes a variety of informal private operators, non-governmental organizations, community based groups and voluntary religious organizations. The activities of vary from one another. The popular sector does not have formal influence in the management of the municipality

The last sector is that of Community Based Groups. The group is interested self-help activities. They have objectives of supplementing incomes of their members. Examples of the groups include those of food vending, second-hand gear trade, handicraft, and carpentry.

Besides of the national and local administrative and management stakeholders, there are public and private organizations that are stakeholders in the management of development issues in the municipality. The public organizations include Tanzania Electrical Supply company (TANESCO), Regional Post Corporation (TPC), financial organizations such as NMB, CRDB, NBC, SACCOC, NSSF, and NIC; and the National Milling Corporation (NMC). Non-governmental organizations include Pride Tanzania, Rukwa Environmental Youth Organization (REYO), RUKWA Agricultural and Environmental Conservation (RUVAECO) Chama Cha Walemavu Tanzania (CHAWATA) and Kaengesa Environmental Conservation Society (KAESO)

4.2 Municipal Management Settings

According to the organization structure of the Local Government Authorities, the top decision making machinery in the municipal Council is the Full council. It is made up of elected councilors and the residents of the municipality. The roles and function of the council are implemented through the formal council committees, which involve all councilors or council standing committees. The chief executive in the Municipality is the Municipal Director. The director is assisted by Head of Departments and 3 units of various sectors. The Municipal Council has 8 departments and 3 units. The departments are

that of Lands, Natural Resources and Environment; Finance, supplies and Trade; Personnel and Administration; Education; Community Development and Social Welfare; Works and Water; and Agriculture, Livestock and Co-operatives. The units are of Legal, Internal Audit, and Economic Planning and Statistics. Many of the sect oral functions are also performed by some ministries departments in the central government and parastatal organizations. As a result, there are a lot of overlapping responsibilities between the undertaking institutions.

4.3 The Municipal Council Management Team

The Council Management Team (CMT) comprises of all Head of department outlined in the preceding section. The responsibility of heads is to formulate policies regulating to their sectors in accordance with national policies, regulations, and guidelines. They propose projects through the councils standing committees. The projects need to be endorsed by the full council for implementation.

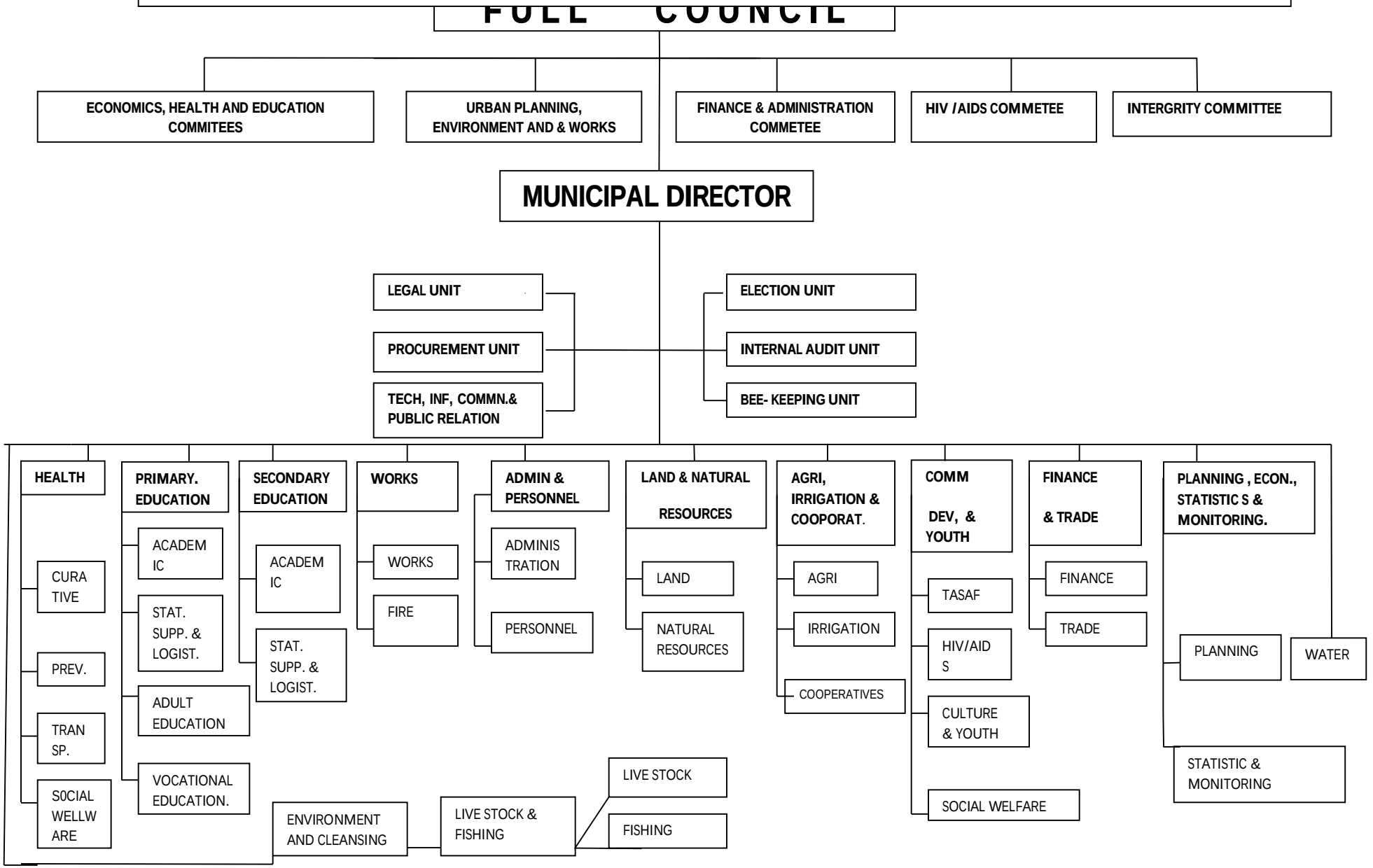
4.4 Strengthening Management Arrangements

The administrative organization depicts the role it has to play to strengthen the management of the municipality. Traditionally, the municipal council has been responsible for organizing services such as water supply, and disposal of solid and liquid waste. It has been organized hierarchically and pivoted on revenue generation depending on the states view on the risks and benefit of the council itself. This structure, which has political dimension, has its advantages and disadvantages. The sect oral and hierarchical organizations are suitable for certain task and are efficient on service delivery, maintenance of infrastructure and regulating activities. However, these roles are not adequately fulfilled by the municipal council. Hierarchical structures are for active management of development activities. Sometimes these activities need informal, non-legalistic, decentralized, and multispectral approaches. A new, institutional oriented structure needs to be devised to improve the operationalisation and coordination between existing institutions

Conclusion and Recommendation

The growing numbers of populations in Sumbawanga Municipality does increase the pressure to improve economic and social services especially to the people in need. One such method the Council endeavors to bolster economic growth is through improvement of the investment environment and so encourage potential Investors to effectively utilizes the untapped resources and investment opportunities. With better transportation networks especially availability of newly constructed tarmac roads which connects Sumbawanga to Mbeya city, Tunduma town and Kasanga port makes Sumbawanga an ideal place for investment in food processing, solar energy supply, provision of agricultural inputs and machineries, construction of hotels, dry land ports, and property development. Sumbawanga Municipal council, both the management and the Councilors have high expectations and indeed desperate to encourage investors to come and invest in Sumbawanga.

Figure 5: Municipal Administrative Organization Chart



Annexture 1: Meteorological report

1.1 Municipal Rainfall.

From the data observed at Sumbawanga meteorological agency station the rainfall normally starts at around early November and April. This rain is mostly convective type of rain from mainly cumulus, stratocumulus, altostratus and cumulonimbus clouds which in most cases are associated with thunderstorm. During rainfall season the wind pattern is westerly.

Sumbawanga Municipal rainfall zones;
There are two zones;

A. Southern, south east which receives heavy rainfall above 90mm annually; these include;- Mollo prison farm 903,7mm and Katumba 1010.6mm.

B. Northern and central part which receives moderate annual average between 800-900mm, station being Sumbawanga meteorological station, Sumbawanga Maji and Sumbawanga Kilimo.

1.2 Climatic condition of Municipality

Is subdivided into three main seasons which are;

i. Early Nov- Mid April: Period of moderate temperature, rainfall and winds.
ii. May to July: The period of low temperature as low as 4^0c, moderate wind and low humidity.
iii. August to October: Is a dry period accompanied with strong winds mainly easterly and higher Temperature especially during the day.

1.3 Air Pollution

For Sumbawanga Municipal the case of air pollution is still very little as well as we have no industries, the only pollution comes from motor vehicles, burning forest and bush fires. However due to Global wind Circulation the polluted clouds are sometimes blown by winds to our area and hence we have acid/black rain like that occurred on 28th & 29th December 2006 and 1th January 2007

1.4 Flooding

Geographically our Municipal is at high altitude (5962 ft AMSL), so is impossible for floods to happen, from Meteorological point of view floods occurs when the river banks cannot hold the amount of water and the excess is forced to flow with no specific direction, so flood cannot happen in high altitude area like Sumbawanga. However there are some cases of localized events around Malangali area almost every year.

1.5 Drought

From the Meteorological point of view, the Drought is described as when the annual total evaporation exceeds the total annual rainfall. This will lead to have short comes in Agriculture, Hydro-Electric Power generation, Water Intakes etc. hence no documented drought in our area.

1.6 Storm Water

There is no storm water experienced in our Meteorology station.

1.7 Sectoral Impacts on Development and Environment

According to the Tanzania Meteorological Agency's Vision which is "To stand as the centre of excellence in accelerating National Development through provision of World Class Meteorological Services by year 2015" this implies that every sector have to use the available Meteorological data and services like the forecasts in their day to day activities and planning. It is true that in using our Meteorological data and services in various sectors like in Road Works, Agriculture, Forestry, Energy, Transport, mining, Fishing, Communications and other will end up in high output and hence contributing in the National Strategy for Economy and Poverty Reduction.

1.8 Present Status

Since its conversion forms the former Directorate of Meteorology which was purely a Governmental Department to Tanzania Meteorological Agency, according to the Executive Agencies Act of 1997, there is much improvement almost in all terms such as the rehabilitation of the office building, new furniture and improved communications just to mention few.