

The Socioeconomics Impact and Environmental challenges of the South Sudan Breweries Limited on the Population of Janduro Area

Case study: Janduro Area in The Republic of South Sudan – Juba

Awejok Youhana Daniel Ngor,

Master Candidate, Tongji University, UN Environment – Tongji Institute of Environment for Sustainable Development (IESD); College of Environmental Science and Engineering; E-mail: 1793419@tongji.edu.cn, danielngor@gmail.com; Phone No: +86 13120812370; Address: 1239 Siping Road. Shanghai 200092, China.

Ying Liu,

Mentor and Supervisor; Phone/Fax: 86-21-65984268; E-mail: liu_ying@tongji.edu.cn, liuying.tongji@gmail.com; Address: 1239 Siping Rd. Shanghai 200092, China

Correspondence Author: Awejok Youhana Daniel Ngor; Phone/ +86 13120812370;
E-mail: 1793419@tongji.edu.cn, danielngor@gmail.com

DOI: 10.29322/IJSRP.8.12.2018.p8463

<http://dx.doi.org/10.29322/IJSRP.8.12.2018.p8463>

Abstract: The industrialization can be traced back almost 5,000 years ago to Mesopotamian writings describing daily rations of beer and bread to workers. Before the rise of modern breweries, the production of beer took place at home and was the domain of women as baking and brewing were seen as women's work (Schlimm J, 2005). Breweries as production facilities reserved for making beer did not emerge until monasteries and other Christian institutions started producing beer not only for their own consumption, but also for sale. The industrialization of brewing shifted the responsibility of making beer to men. The oldest, but still functioning brewery in the world is believed to be in German state, owned by Weihenstephan, brewery in the city of Freising, Bavaria. It's history goes back to 1040 AD this was disputed by the nearby Weltenbug Abdey brewery whose history could be traced back to its beer brewing tradition to at least 1050 AD, the Zatec brewery in the Czech Republic (Schlimm J.2005). According to the book of the economic impact of Brewery Tripe value strategy consulting The Hague, February 2008 it was said that: The model was developed for this study combines the distribution of Brewery's revenues over its various financial stakeholders (e.g. suppliers, employees, government, dividends etc.) with an input-output description of the national economy. The Socio Economic Impacts of the industrial sector is one of the most fundamental issues that is affecting most of the population, especially in the undeveloped countries and those whom lives in particular area with the company. It is the global responsibility of every individual, government, non-governments organizations and private sectors to find out some alternative procedures that would improve the standard of living and their economics all over, without posing serious environmental and socio-economic problems. In the Republic of South Sudan especially Juba, Janduro area in Rejaf Payam during the visit and interview are found the most serious issues facing local communities are not fully aware about the health effects and environmental impacts which can be cause by the company during life time of project, other things like air pollution of burning solid wastes, odour smell, emission of gases in rainy season the individuals respondents which agreed (100%) in the area widely especially during night the all area have smell, even makes communities unable to sleep well. The main potential odour sources from vapours from wort boiling, wastewater treatment, storage and handling of co- and by-products, oil

storage, ventilation of beer cellars and packaging lines, and stack emission from the boiler house. The main reasons for odour nuisances from location toward neighboring areas, no vapour condensing from wort boiling, Mal-operation of heat recovery system for the wort boiling, storage of by-product during summer periods, and content of sulphate in wastewater, which will cause malodors if the Wastewater becomes anaerobic. The respondents are (76%) said that the noise pollution in the area widely especially during night from heavy mechanizes which are used in the processes and you cannot sleeps well at night. So other respondents who disagreed are (24%). Indeed, the socioeconomic impacts individuals other than the drinker can be affected, for example, by traffic accidents or an increased risk of violence or HIV infection. Drinking outside the home can mean less time spent at home. After all these problems local communities, stakeholders and government they are still emphasized about the improvement in the area in terms of job opportunities, facilities and services to the local communities from the company, but Few numbers of the local population are working in SSBL. Moreover, the establishment of the company in the area has disrupted other social and economic activities previously existing in the area. The researcher also found that the establishment of the company didn't follow the usual procedures of human health, safety, and environmental issues (for examples, Environmental Impacts Assessment, Environmental Management, Strategy Impacts Assessment, Environment Assessment, Planning and Projects Management, etc.).The EIA for SSBL was not done under the supervision of South Sudan Government as an overall environmental authority in the country. The researcher, therefore strongly recommended environmental auditing for SSBL. Meanwhile SSBL should take urgently action to remove the dumping manufacturing wastes, control solids wastes and wastewater which are flowing into mainstream passed through the area direct into River Nile. The local population should be involved in all aspects (planning, construction, employment) of establishment of new industries or any new projects in any location, for the government of South Sudan has to enact laws for alcohol consumption in the country specially for drivers of different types of vehicles and educate people through awareness of impacts of alcohol consumption to their health and lifestyles and social impact.

Key Words: Environmental Problem, Pollution, Republic of South Sudan, Juba- Janduro Area, Socioeconomic Impacts issues and Problem.

1.0. INTRODUCTION

1.1. Introduction:

The industrialization can be traced back almost 5,000 years ago to Mesopotamian writings describing daily rations of beer and bread to workers. Before the rise of modern breweries, the production of beer took place at home and was the domain of women as baking and brewing were seen as women's work (Schlimm J, 2005). Breweries as production facilities reserved for making beer did not emerge until monasteries and other Christian institutions started producing beer not only for their own consumption, but also for sale. The industrialization of brewing shifted the responsibility of making beer to men. The oldest, but still functioning brewery in the world is believed to be in German state, owned by Weihenstephan, brewery in the city of Freising, Bavaria. It's history goes back to 1040 AD this was disputed by the nearby Weltenbug Abdey brewery whose history could be traced back to its beer brewing tradition to at least 1050 AD, the Zatec brewery in the Czech Republic (Schlimm J.2005). According to the book of the economic impact of Brewery Tripe value strategy consulting The Hague, February 2008 it was said that: The model was developed for this study combines the distribution of Brewery's revenues over its various financial stakeholders (e.g. suppliers, employees, government, dividends etc.) with an input-output description of the national economy. Provides a schematic overview of the modeling approach. Input-output analysis considers inter-industry relations in an economy by depicting how the output of one industry goes to another industry where it serves as an input; it makes industries dependent on one another, both as customer of outputs and as supplier of inputs.

The Republic of South Sudan became the world's newest nation and Africa's 54th country on July 9th, 2011, following a peaceful secession from the Sudan through a referendum in January 2011. As a new nation, it has the dual challenge of dealing with the legacy of more than 50 years of conflict and continued instability, along with huge development needs. Formal institutions are being built from a very low base and the capacity of government to formulate policy and implement programs is limited, but growing. While the White Nile River flows through the entire length of South Sudan, it is a landlocked country that falls almost entirely (96 per cent) within the Nile River Basin in East-Central Africa. However, South Sudan country is surrounded with many countries as it is located in the South of the Republic of Sudan, Ethiopia in the East, Kenya in the Southeast, Uganda in the South, Congo in the South West, and in the Northwest of the country is the Central African Republic. South Sudan as a region it has ten states (central Equatoria, Eastern Equatoria, Western Equatoria, Upper Nile state, Unity State, Jonglei State, Western Bahr El Gazal, Northern Bahr el Gazal, Warab state, and Lake State). It occupies an area of 658,842 km². The country is covered by extensive grasslands, wetlands and tropical forests. Its natural assets include significant agricultural, mineral, timber and energy resources. The climate is mostly hot and dry, with seasonal rains that allow for two or three harvests a year in the county's green belt. Apart from oil, however, its natural resources are largely unexploited and only 4.5 per cent of its potential arable land is cultivated. Which has 64 different ethnic groups inhabit South Sudan. With fewer than 13 people per square kilometer, population density in the country is one of the lowest in sub-Saharan Africa. Livelihoods in the northern dry areas are dominated by seasonal agriculture, pastoralism, fishing and hunting. Livelihood opportunities vary in the low woodland savannahs in the country's center. South Sudan is endowed with a natural environment rich in biological resources. These include a large variety of ecosystems, a vast array of globally important species of flora and fauna and an unknown lode of genetic diversity. It is the home to the Sudd wetland, one of the world's largest tropical wetlands, and to one of the greatest circular migrations of wildlife on the planet. Most of the population lives close to the natural environment, directly depending on forests and woodlands for fuel and food products, local soils in which to grow their crops, pastures for their livestock and nearby water sources for household needs. These ecosystem goods and services constitute the foundation of South Sudan's socioeconomic development.

A 2008 census showed that the population of South Sudan was 8,260,490. However, this figure is hotly disputed because the census was conducted by the Sudanese Government of the time and is (believed by many to have been manipulated for political reasons). As the distribution of wealth between Sudan and South Sudan at the point of independence was determined in part by their relative populations, the government in Khartoum had an incentive to manipulate the figures. Additional criticisms of the 2008 Sudan population census were that it excluded the South Sudanese diaspora, that poor weather and communication conditions had prevented some people from being surveyed, and that the Sudanese Government had refused to share the raw population data from the census with the Government of South Sudan. It is estimated that around 11% of South Sudanese people were not surveyed, which, if correct, would mean that the population of South Sudan in 2008 was around 9.28 million people. The South Sudan population in 2011 was considerably higher - perhaps as much as 10-12 million. Today, the population in 2018 is estimated to be 12.92 million (<http://sudanwatch.blogspot.com/2009/05/population-of-south-sudan-826-million.html>).

The South Sudan Breweries Limited is located at Janduro area, east of Eye Radio FM in Juba and is the biggest company in South Sudan. According to the manager of the company, was established on 08.11.2006 and in the middle of May, 2008 it started production of beers using water from the Nile. The first production of this company is known as White Bull and water from the River Nile is being treated using three big tanks: water is pumped from the Nile River and stored in the first tank which uses sand filter to clean the water from the solid wastes and other wastes. After the first treatment the water is passed to the next tank which treats water by using charcoal to absorb the unwanted wastes, organisms and other materials from the water. At the last stage the water is passed to the last

tank for disinfection by adding the chlorine, and the water becomes clean and useful to the company and other services such as production, drinking, washing and irrigation of trees inside the company, in order to make the area to look beautiful. The company also supplies the treated water to community in that area and the areas nearby brewery. Use this water for drinking, domestic uses and other purposes in that area. Other services provided by the company in the area are job opportunities to local communities and provision of the Towns in the country with sodas, beers, mineral water and then the payment of taxes to the government which facilitates the delivery of services. In the case of the protection of the communities in the area, from the environmental pollution or impacts of the company (SSBL) most community members in the area said that there is no any environmental protection in the area, while the Director of Human Resources Department in (SSBL) said they have instated state of art, gas recovery plants and waste water treatment plants (Field survey July.2018). SSBL is one of contributing entity to the country's economic and its one of its kind to be establish in the country. Just like any other entities, SSBL didn't consider undertaking environmental impact assessment to cater for environmental needs despite the fact that it contributes to the social welfare of the people through job creation, however not all the populace do benefit from this project. It's on this context the researcher is trying to assess the social economic impact of the local community.

1.3. Objectives of the Research:

- i. To investigate the effects of the SSBL on the local communities in the study area.
- ii. To examine the role of the SSBL in provision of job opportunities to the Local Population of the Area.
- iii. To examine the role of the SSBL in services provision to local population.
- iv. To investigate the health, environment challenges and social problem associated with the SSBL pollution.

1.4. The Study Area:

1.4.1. Location:

This research was conducted in Juba Town in Janduro Residential area Block Five, Rejaf Payam- Central Equatoria State (CES). Juba is the capital of Central Equatoria and became the interim seat and the capital of the government of South Sudan. Juba is one of the fastest-growing cities in the world, and is developing very rapidly after the signing of CPA. Juba's diverse community is made up of approximately 250,000 residents that according to the survey Department, form all Juba is located in CES it is altitude is 458m and between latitude of 4°-6°N of the Equator and longitude of 30° - 32° E of Greenwich Meridian. The town mostly lies at the Western bank of River Nile (White Nile), also called as Bahr-El Jebel and located along the River Nile and it has heterogeneous communities. Although the area of the study is within Juba town it can take 40 minutes by using public transportation as Janduro is located in west of Juba Town (www.googlemap.com) Source: **These two pictures show the location of the study area Janduro capture by Google earth map:**



Plate 1. Show the location of SSBL in Google Earth Map



Plate 2. Show the location of SSBL in Google Earth Map and surrounding by residential areas

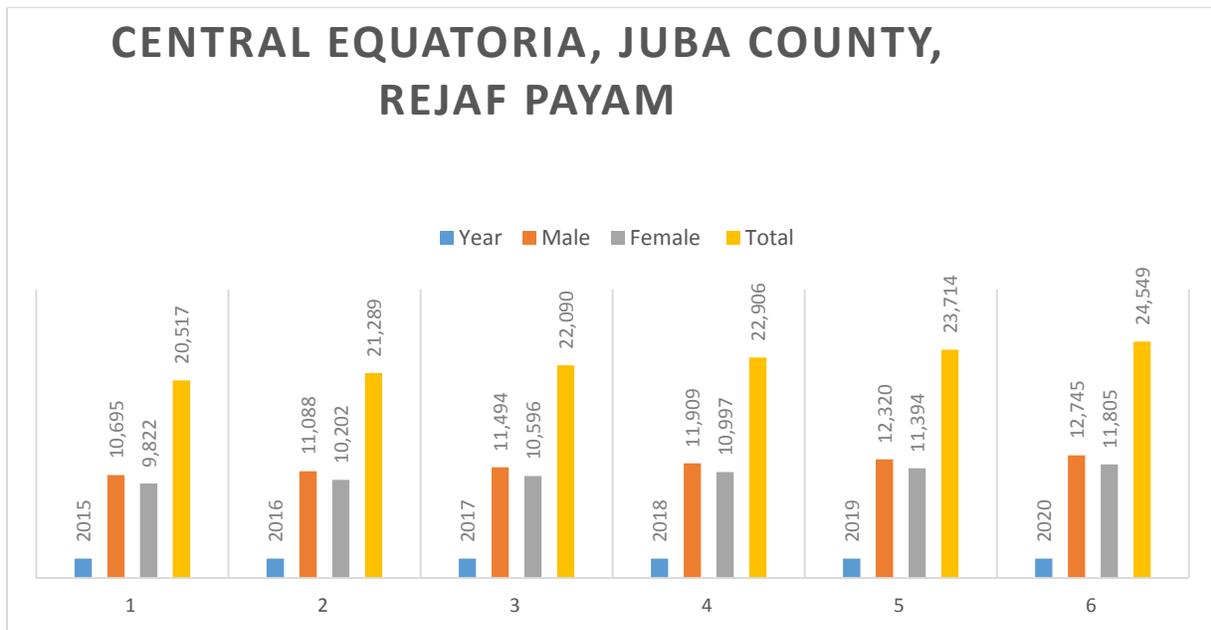


Figure 1: Population Projections for South Sudan by Payam from 2015 – 2020 (National Bureau of Statistics, April, 2015)

Source: South Sudan National Bureau of Statistics (web).

Handing Over Note: Rejaf Payam unit was created in May 1996 vide decree NO 5/99 issue by former Wali of BJS (Rdt) Col Henry Jada Zakaria. The area of Rejaf by within Bahr El Jebel locality. Rejaf’s diverse community is made up of approximately 120,000 residents that according to the survey Department, formally occupy over 60,000 plots of land in greater Rejaf East. Its inhabitants of Bari tribe.

1.4.2. Geographical position

Rejaf Payam lies in South of Juba Town and is extending from Juba to Kujo at distance of about 35 Miles and from Pojulu to Kuda River at distance of about 55 Miles at North-South and West-East transacts respectively. The HQs Office still in Juba but it will be moved to Gumbo area where already the actual Head Quarters will be built in Rejaf.

1.4.2.1 Climate of the area:-

The climate of Rejaf Payam as a part of Central Equatorial State (CES) yearly weather comprises of rainy season and dry season which is the general climatic characteristics of the area. The rainy season’s starts early at month of April and ends in October the rainy season take seven months and dry season starts from the month of November and comes to an end in month of March. The sun shines throughout the year; even the rainy season has high temperatures, strong wind which result to a dust storm and pollutes the environment of the area. When the South Sudan became independents there has been increase in number of the populations, day after day and occupied many places shanty towns. This could have caused changes in the climate of the area and the establishment of South Sudan Breweries Limited (SSBL) could have caused changes in some climatic factors, due to the pollution from the factory.

1.4.2.2. Temperature:-

The average temperature of Rejaf Payam is the same with the temperature of Juba town because it was closed to Juba town and both of them are in the Central Equatorial State, so the temperature of the area is 27.5° C or (83° F) and the a range of the month temperature is 4.5°c, the warmest average maximum temperature is 38°C or (99°F) in months of January, February, and March, the coolest average minimum temperature is 20° or around (68°F) in months of January, November and December .

1.4.2.3. Rainfall (precipitation):-

The rainfall in the area of the study which is Rejaf Payam is on average 997mm (39.3 in) annually or 83mm (3.3 in) each month. On the balance there are 104 days annually on which greater than 0.1mm (0.0004 in) of precipitation (rain, sleet, snow, hail) occur or days on an average month. The month with driest weather is January the balance 3mm (0.1 in) of rain, sleet, hail or snow falls across one day. While the month with wettest weather is May when on balance 159mm (6.3 in) of rain, hail or across 13 days.

1.4.2.4. Humidity:

The relative humidity of the study area an average/ year is recorded as 45.9% of humidity and on a monthly basis it ranges from 24% in January and February to 63% in August. There are hours of Sunshine range between 5.9 hours per day in July and 9.5 hours per day in January, on balance there are 2788 sunshine hours annually and approximately 7.6 hours of sunshine for each day. (www.climatemaps.com, 2012).

1.5. Soil:

The soil in the area of the study is the same with the soil of Juba town, the soil of Janduro area is characterized of sandy soil, loamy soil, clay soil or rocky soils and the area are sloped up, and down like mountain, the loss of the soil is very high due to very high rate of erosion. The sandy soils consist of large sized particles leaving relatively large pores between them and allows a rapid water movement when the soil is filled with water. The capillary rise in sandy soil is very limited as few small sized pores are available. Loamy soils generally have the following characteristics.

- a. Part of the water does not infiltrate into soil and it is lost by surface runoff of water.
- b. Part is drained to the sub-soil (on sandy and soil and especially on sandy and soil and especially on soil consisting of stones only).
- c. Part of the water evaporates from loam soil consisting of small particles leaving many sized pores between them. Clay soil consists of less than 40% of sand and more than 40% of clay particles.

1.6. Population of the area:

The original population or communities in the area of the study are Bari- which lives in Rejaf Payam. According to the South Sudan center for census, statistics and evaluation the population of the Rejaf Payam. According to households interviewed in Janduro area block five it has been found out that in 50 households interviewed about there were 579 persons and the average household size is 7 persons per households. This means there is high/low population number in that area. The numbers of Males 26% and female 31% respecting of the total population number of households interviewed. While the numbers of children are (43% of total population of households interviewed) in different ages and gender.

1.7. Government Institutions at Rejaf Payam:

The numbers of the schools in the Rejaf Payam are 17 Basic schools, government schools are eight, private schools are eight and one private secondary school and three numbers of church which are registered and muqes for Islamic people according to department of education office in Rejaf Payam. In other area they used to teach under the trees like that in the area of the study, and 12 churches, 3 small muqes for the Islamic people in the area and faculty of police for teaching and training in Rejaf west. Always according to survey in area and according to department of public health office they were said that they have 3 health centers in Rejaf Payam one in Rejaf East, one in Gombo, one in lalogo Western Rejaf. Also according to Janduro block five has the area of the study has to teach under the trees in the first classes of primary levels then take them to those schools in Juba town to learn more, but now there was

school built organization in the area that in case of the returning those came from Khartoum and that school near to the SSBL at Eastern side, so there are 2 churches in the study area and small market. According to Mr. Lado Malash.

1.8. Economic Activities in the Area:

The economics activities in the area are Firewood collection Small bundle, Big bundle, Charcoal-burning Stone breaking or breaking of rocks from the mountains, (One truck load is equivalent to approximately seven tones or one to two, weeks of labour depending on the number of workers.), Making bricks, Smearing houses, Washing clothes, Washing dishes, Charcoal retail, (bags bought from charcoal-burners and sold at markets) Food retail Tea-making and baking, Agricultural activities in small farmers and Vegetables, Alcohol brewing and motor bikes (Boda boda).

2. Research and Elaborations

2.1. Introduction

The purpose of literature review is to compare the findings of other researchers and see the problems they faced during data collection and their deviations. The data for the review was collected from various books, journals, internet, NGOs reports, and interview with Payam officials and residents of Rejaf Payam.

2.1.1 Socioeconomics:

Socioeconomics or **socio-economic** or **social economics** is an umbrella term with different usages. 'Social economics' may refer broadly to the "use of economics in the study of society." More narrowly, contemporary practice considers behavioral interactions of individuals and groups through social capital and social "markets" and the formation of social norms. In the latter, it studies the relation of economics to social values. A distinct supplemental usage describes social economics as "a discipline studying the reciprocal relationship between economic science on the one hand and social philosophy, ethics, and human dignity on the other" toward social reconstruction and improvement or as also emphasizing multidisciplinary methods from such fields as sociology, history, and political science In many cases, socio economists focus on the social impact of some sort of economic change. Such changes might include a closing factory, market manipulation, the signing of international trade treaties, etc. Such social effects can be wide-ranging in size, anywhere from local effects on a small community to changes to an entire society. These may affect patterns of consumption, the distribution of incomes and wealth, the way in which people behave (both in terms of purchase decisions and the way in which they choose to spend their time), and the overall quality of life. The goal of socioeconomic study is generally to bring about socioeconomic development, usually in terms of improvements in metrics such as GDP, life expectancy, literacy, levels of employment, etc. Although harder to measure, changes in less-tangible factors are also considered, such as personal dignity, freedom of association, personal safety and freedom from fear of physical harm, and the extent of participation in civil society. (Pokrovskii and Vladimir P; 2011).

2.1.2 Brewery:-

Brewery is a dedicated building for the making of beer, though beer can be made at home, and has been for much of beer's history. A company that makes beer is called either a brewery or a brewing company. The diversity of size in breweries is matched by the diversity of processes, degrees of automation, and kinds of beer produced in breweries. A brewery is typically divided into distinct sections, with each section reserved for one part of the brewing process. Suhlimm. J (2005).

2.2. Industrialization of the brewery:

Before the rise of the industrialization of breweries, the production of beer took place at home and was the domain of women, as baking and brewing were seen as "women's work". Breweries, as production facilities reserved for making beer, did not emerge until monasteries and other Christian institutions started producing beer not only for their own consumption but also to use as payment. This industrialization of brewing shifted the responsibility of making beer to men. Early breweries were almost always built on multiple stories, with equipment on higher floors used earlier in the production process, so that gravity could assist with the transfer of product from one stage to the next the modern brewery: (April 2012). This layout often is preserved in breweries today, but mechanical pumps allow more flexibility in brewery design. Early breweries typically used large copper vats in the brew house, and fermentation and packaging took place in lined wooden containers. Such breweries were common until the Industrial Revolution, when better materials became available, and scientific advances led to a better understanding of the brewing process the modern brewery: (April 2012). Breweries today are made predominantly of stainless steel, although vessels often have a decorative copper cladding for a nostalgic look. Stainless steel has many favorable characteristics that make it a well-suited material for brewing equipment. It imparts no flavor in beer, it reacts with very few chemicals, which means almost any cleaning solution can be used on it (concentrated chlorine "bleach" being a notable exception) and it is very sturdy. Sturdiness is important, as most tanks in the brewery have positive pressure applied to them as a matter of course, and it is not unusual that a vacuum will be formed incidentally during cleaning. Heating in the brew house usually is achieved through pressurized steam, although direct-fire systems are not unusual in small breweries. Likewise, cooling in other areas of the brewery is typically done by cooling jackets on tanks, which allow the brewer to control precisely the temperature on each tank individually, although whole-room cooling is also common. Today, modern brewing plants perform myriad analyses on their beers for quality control purposes. Shipments of ingredients are analyzed to correct for variations. Samples are pulled at almost every step and tested for [oxygen] content, unwanted microbial infections, and other beer-aging compounds. A representative sample of the finished product often is stored for months for comparison, when complaints are received. The modern brewery: (April 2012)

2.3. Types of brewing companies:

Brewing companies range widely in the volume and variety of beer produced, ranging from small breweries, such as Ringwood Brewery, to massive multinational conglomerates, like SABMiller in London or Anheuser-Busch InBev, that produce hundreds of millions of barrels annually. The biggest brewer in the world is the Belgian company Anheuser-Busch InBev. Some commonly used descriptions of breweries are (The modern brewery: (April 2012).

- i. **Microbrewery**—A late-20th-century name for a small brewery. The term started to be replaced with craft brewer at the start of the 21st century.
- ii. **Farmhouse brewery**—A farmhouse brewery, or farm brewery, is a brewery that primarily brews its beer on a farm. Crops grown on the farm, such as barley, wheat, and/or hops, are usually used in the beers brewed. A farmhouse brewery is similar in concept to a vineyard which grows its own grapes and uses them to make wine.
- iii. **Brewpub**—A brewery whose beer is brewed primarily on the same site from which it is sold to the public, such as a pub or restaurant. If the amount of beer that a brewpub distributes off-site exceeds 75%, it may also be described as a craft or microbrewery.
- iv. **Contract brewing company or contract brewery**—A business that hires another brewery to produce its beer. The contract brewing company generally handles all of the beer's marketing, sales, and distribution, while leaving the brewing and packaging to the producer-brewery (which confusingly is also sometimes referred to as a contract brewer).

- v. **Regional brewery**—An established term for a brewery that supplies beer in a fixed geographical location
- vi. **Craft brewer**—A term that is replacing microbrewery. A craft brewery is a brewery that does not use adjuncts and/or is considered to make craft beer.
- vii. **Macro brewery or Mega brewery**—Terms for a large brewery, which sometimes carry a negative connotation (The modern brewery: (April 2012).

A brew master, or formerly **braumeister**, is a person who is in charge of the production of beer. The major breweries employ engineers with a Chemistry/Biotechnology background. There are organizations that assist the development of brewing, such as the Seibel Institute of Technology in the USA and the Institute of Brewing and Distilling in the UK (The modern brewery: (April 2012).

2.4. The requirements for establishments of breweries:

2.4.1. Requirement and guidelines of funding agencies

According to Parta- Environmental and Social Impact assessment –in October 2008(Africa Resources it was said: ARL has elected to abide by the Equator Principles. The Equator Principles are a set of guidelines, developed by private financial institutions, for managing environmental and social issues related to project financing. These principles are aligned with the requirements of the International Finance Corporation (IFC), which has established a set of Performance Standards that govern environmental considerations of project financing. The IFC's Performance Standards have therefore been used as the yardstick against which to measure compliance with the Equator Principles. The Equator Principles are devised to promote environmental stewardship and responsible development in the context of project financing. Projects are categorized based on the magnitude of the potential social or environmental impacts and risks of that project, in accordance with World Bank Group classification criteria. These categories are:

Category A: Projects with potential significant adverse social or environmental impacts that are diverse, irreversible or unprecedented;

Category B: Projects with limited adverse social or environmental impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures;

Category C: Projects with minimal or no social or environmental impacts. Mining projects, by their extractive nature, tend to fall into Categories A or B, being high or medium risk. For Category A and B projects, the borrower must conduct a social and environmental assessment (i.e. this ESIA) to determine the social and environmental impacts and risks of the project, and to propose relevant and appropriate mitigation and management measures in respect of the project. The ESIA must establish the project's overall compliance with, or justified deviation from, the applicable standards and guidelines. To satisfy the requirements of the performance standards, ARL must prepare an action plan that addresses the relevant findings and draws on the conclusions of the ESIA. The action plan should describe and priorities the actions needed to implement mitigation measures, corrective actions and monitoring measures necessary to manage the impacts and risks identified in the ESIA. Furthermore, ARL must establish and maintain a social and environmental management system that addresses the management of the action plan. Communities that could be affected by a project must be consulted in a structured and culturally appropriate manner to ensure their free, prior and informed consultation. Their informed participation must be facilitated as a means to establish whether a project has adequately incorporated the concerns of affected communities. To accomplish this, the assessment documentation and action plan must be made available by ARL to the public for a reasonable minimum period, in the relevant local language. The borrower must also take account of and document the process and the results of the consultation. To ensure consultation continues throughout construction and operation of the project, ARL must establish a grievance mechanism as part of its management system. The IFC applies the Performance Standards (PS) to

manage social and environmental risks and impacts and to enhance development opportunities in its private sector financing in its member countries eligible for financing. Performance Standards cover the following topics:

- ✚ PS1: Social and environmental assessment and management systems
- ✚ PS2: Labour and working conditions
- ✚ PS3: Pollution prevention and abatement
- ✚ PS4: Community health, safety and security
- ✚ PS5: Land acquisition and involuntary resettlement
- ✚ PS6: Biodiversity conservation and sustainable natural resource management
- ✚ PS7: Cultural heritage

2.4.1.1 Social and Environmental Assessment and Management Systems

Aims at managing social and environmental performance throughout the life of a project. An effective social and environmental management system is a dynamic, continuous process initiated by management and involving communication between the client, its workers, and the local communities directly affected by the project. The objectives of the standard are summarized as:

- ✚ To identify and assess social and environmental impacts;
- ✚ to avoid, minimize, mitigate, or compensate for adverse impacts on workers, affected communities, and the environment;
- ✚ To ensure that affected communities are engaged; and
- ✚ To promote improved social and environment performance through the effective use of Management systems.

Covers social and environmental management systems, social and environmental assessment, management programs, organizational capacity, training, community engagement, and monitoring and reporting.

2.4.1.2 Labour and Working Conditions

Aims to establish maintain and improve the worker-management relationship that promotes the fair treatment, non-discrimination and equal opportunity of workers, and compliance with national labour and employment laws. This standard also aims to protect the workforce by addressing child labour and forced labour and promoting safe and healthy working conditions, and to protect and promote the health of workers. Covers human resources policy, working relationships, working conditions and terms of employment, workers organizations, nondiscrimination and equal opportunity, retrenchment and grievance mechanisms. Under Protecting the Work Force" it covers child labour and forced labour. Occupational health and safety, non-employee workers and supply chain are also discussed.

2.4.1.3 Pollution Prevention and Abatement

Outlines a project approach to pollution prevention and abatement in line with internationally disseminated technologies and practices. The objective is to minimize adverse impacts on human health and the environment, and to reduce the emissions that contribute to climate change. Covers pollution prevention, resource conservation, energy efficiency, wastes, hazardous materials, emergency preparedness and response, technical guidance, ambient considerations, greenhouse gas emissions, pesticide use and management.

2.4.1.4 Community Health, Safety and Security

Addresses the proponent's responsibility to avoid or minimize the risks and impacts to community health, safety and security that may arise from project activities. The objective is to minimize risks and impacts on the health and safety of the local community, and to ensure the safeguarding of personnel and property. Covers community health and safety requirements, infrastructure and equipment safety, hazardous materials safety, environmental and natural resources issues, community exposure to diseases, and emergency preparedness and response.

2.4.1.5 Land Acquisition and Involuntary Resettlement

Involuntary resettlement refers to both physical displacement (relocation or loss of shelter) and economic displacement (loss of assets or access to assets that leads to loss of income sources or means of livelihood) as a result of project related land acquisition. Resettlement is considered involuntary when affected individuals or communities do not have the right to refuse land acquisition that result in displacement. The objective can be summarized as:

- ✓ To minimize involuntary resettlement;
- ✓ To mitigate adverse social and economic impacts;
- ✓ To improve or restore the livelihoods of displaced persons;
- ✓ To improve living conditions among displaced persons.

Covers project design, compensation and benefits for displaced persons, consultation, grievance mechanisms, resettlement planning and implementation, displacement (physical and economic), private sector responsibilities under government managed resettlement.

2.4.1.6 Diversity Conservation and Sustainable Natural Resource Management

Address how clients can avoid or mitigate threats to biodiversity arising from their operations as well as sustainably manage renewable natural resources. The objective is to protect and conserve biodiversity and to promote sustainable management and use of natural resources. Covers protection and conservation of biodiversity, habitat (modified, natural and critical), legally protected areas, invasive alien species, management and use of renewable natural resources, natural and plantation forests, and freshwater and marine systems.

2.4.1.7 Cultural Heritage

The aim is to protect irreplaceable cultural heritage and to guide proponents on protecting cultural heritage in the course of their business operations. Cultural heritage refers to tangible forms of cultural heritage, such as property and sites having archaeological, paleontological, historical, cultural, artistic, religious and unique natural value. Intangible forms of culture, such as cultural knowledge, innovations and practices of communities embodying traditional lifestyles, are also included. The covers protection of cultural heritage in project design and execution, internationally recognized practices, chance find procedures, consultation, removal of cultural heritage, critical cultural heritage, and the project's use of cultural heritage.

2.5 Socioeconomic impacts of the brewery:

2.5.1 Modeling approach

According to the book of the economic impact of Brewery Tripe value strategy consulting The Hague, February 2008 it was said that: The model that was developed for this study combines the distribution of Brewery's revenues over its various financial stakeholders (e.g. suppliers, employees, government, dividends etc.) with an input-output description of the national economy. Provides a

schematic overview of the modeling approach. Input-output analysis considers inter-industry relations in an economy by depicting how the output of one industry goes to another industry where it serves as an input; it makes industries dependent on one another, both as customer of outputs and as supplier of inputs.

2.5.2 Social Accounting Matrix

The key ingredient of the model is the so-called Social Accounting Matrix (SAM). The SAM represents the flows of all economic transactions that take place within the national economy. It is a statistical and static representation of the economic structure of the country and must reflect fairly recent data. All sectors or stakeholders (industry sectors, households, governments etc.) are both buyers and sellers. Final consumption induces production which leads to money transfers between the various sectors which subsequently generates incomes for households, governments (taxes) and profits (dividends and savings). After that, the final beer consumption can be traced in money terms throughout the economy. In doing so, the total economic effect related to the presence of Athenian Brewery are subdivided into three effects:

1. Direct value chain effects: Value added generated and jobs provided by Brewery, its direct suppliers (i.e. recipients of cash coming from Brewery) and the wholesale and retail trade associated with selling Brewery products (also known as direct and first-round effects);
2. Indirect effects: Value added generated and jobs provided by companies further away in the Brewery value chain, i.e. the suppliers of Brewery's suppliers and wholesale and retail trade partners (also known as second-round effects);
3. Induced effects: effects due to the increased expenditures of households due to increasing incomes generated by the direct value chain and indirect effects (also known as third-round effects).

2.5.3 Household income and government taxes

The Brewery's value added consists of three components: household labour income (salaries), taxes paid to the government and company profits and household savings. Each of these components is made up of direct, indirect and induced effects, as was described in Section 2. As is shown in Exhibit 3, Brewery's presence generates EUR 1,492 mln in value added in the national economy (or EUR 1,046 mln when conservatively not including induced effects). Of this, EUR 642 mln (43%) is related to the direct value chain of Brewery and EUR 8505 mln (57%) of indirect and induced effects. Total tax income generated by Athenian Brewery is EUR 467 mln, which represents 1.05% of the total national tax revenues. 72% of these taxes (EUR 336 mln) are generated by Brewery's direct value chain (i.e. excise duties, value-added tax and corporate taxes), corresponding to 0.75% of Greece's tax revenues.

2.5.4 Employment generation

Employment figures for 16 sectors were obtained from the National Statistical Service of Greece. By combining these with the output per sector from the SAM, the employment intensity (number of jobs per EUR 1,000 of output) can be determined. Using the model results of industrial output (corresponding with the "transfers" quadrant in Exhibit 1) and the employment intensities per sector, the employment generated by Athenian Brewery, both in the direct value chain as well as in the broader economy can be computed. The results are shown in Exhibit 4. As can be seen, Athenian Brewery provides employment directly for 1,274 people. Direct suppliers provide another 2,859 jobs and wholesale and retail trade partners provide 30,689 jobs. In the entire value chain (from farmers supplying Barley until small retailers selling the final product) 34,822 jobs are provided. This brings the value chain employment multiplier to 276, i.e. for every job directly provided by Athenian Brewery, a total of 27 jobs exist in the value chain. Because companies in the Athenian Brewery value chain also provide indirect employment and the additional spending of households provides induced employment, the total amount of jobs that are sustained by Athenian Brewery's presence is almost 55 thousand. This implies

an overall employment multiplier of 43. In 2006, on average 4.45 mln people held jobs and the jobs sustained by Athenian Brewery constitute 1.2% of that. Exhibit 5 shows a more detailed breakdown of the jobs generated in the entire Greek economy. For every sector the number of jobs generated by the Athenian Brewery direct value chain, indirectly by suppliers further away in the value chain and the jobs induced by households spending part of their incomes.

2.5.5 Scenario analyses

One of the objectives of the economic impact model is to enable management to analyze the broader socio-economic impact of its decisions. This section describes two scenarios that have been analyzed using the model. The first scenario is an increase of local content in Athenian Brewery's products and the second is the comparison of the impact associated with locally-manufactured products with imported products.

a) Increasing local content

Currently, Athenian Brewery procures a little over EUR 0.65 mln of Barley from within Greece. For 2008 it is projected that this amount will increase to EUR 3.70 mln¹⁰. A scenario has been analyzed in which the total expenditure to farmers increases by EUR 3.05 mln and the imported Barley reduces by the same amount. Exhibit 6 shows the impact on value added. As can be seen, the increase of locally-produced Barley by EUR 3.05 mln results in an increase of value added of EUR 3.39 mln. Because the agricultural sector is a net recipient of subsidies¹¹ (which are accounted for as negative taxes in the model) the positive impact on household labour income and profits & savings is partly offset by lower tax income. The increase of locally-produced Barley purchases generates 209 jobs in the Greek economy. Obviously, the majorities of these jobs (172) are in the agricultural sector and are directly related to the Athenian Brewery value chain (164). But because the Barley needs to be processed and transported and the increase of household labour income induces additional demand in the economy there is some indirect and induced effects as well.

b) Brewery as an importer of foreign-produced goods

Athenian Brewery's revenues come from products that are manufactured locally. As was shown already in Section 4.1, local production has a positive economic impact. In order to quantify the impact of Athenian Brewery's local production, a scenario has been constructed in which Athenian Brewery transforms into an importer of foreign-produced products. The characteristics of this scenario are:

1. Total Brewery revenues and profits remain unchanged;
2. Costs of producing locally is identical to producing abroad;
3. A reduction of local spending by EUR 98 mln¹²;
4. A reduction of the workforce of Athenian Brewery of 753 people (-60%) and a reduction of personal income tax payments (withheld by Athenian Brewery) of EUR 6 mln (-55%).

The reduction in value added by EUR 149 mln associated with this scenario. This corresponds to 10% of the total value added indicated in Exhibit 3. This reduction manifests itself most prominently in the lower household labour income (EUR 84 mln or 14% of the current household labor income in Exhibit 3). With a reduction of EUR 25 mln (5% of the EUR 467 mln indicated in Exhibit 3), tax income is least affected since excise duties and value added tax (the largest components) would still be levied. Exhibit 9 depicts the effect of importing all products from abroad on employment. The total job loss associated with this scenario would be 4,232. Relative to the 54,817 jobs mentioned in Exhibit 4, this is a reduction of 7.8%. Although this fraction looks quite small, it must be remembered that most of the jobs are associated with wholesale and retail trade and that these would not be significantly affected. In the more upstream part of the value chain, the relative effects would be significantly larger.

2.7. Challenges faced in implementing EIA mitigation measures in the Republic of South Sudan:

As part of this study, the interviewees were requested to give the challenges encountered while implementing mitigation measures and all the 10 interviewees (100%) cited the high financial costs involved. For example because of the high financial costs involved in implementing mitigation measures, environmental officers were not employed, no routine 86. Environmental audits and no effluent treatment plants are in place. However, these developers/managers were not aware that it is their responsibility to meet the costs of pollution control and prevention from their industries. Sadler et al (2002) explain that, impact mitigation is consistent with the Polluter Pays Principle (PPP), which places a responsibility to proponents to internalize the full environmental costs of development proposals. The full polluter pays principle which is principle 16 of the Rio declaration states that; "National authorities should Endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment".

The reason as to why majority of the developers and managers of industrial projects complained of high financial costs associated with implementation of mitigation measures, could be probably because EIA practitioners did not include the economic analysis of the mitigation measures in the EIA reports. A standard EIA report should have the cost-benefit analysis of the recommended mitigation measures, such that developers are aware of the costs involved in undertaking their projects before implementation. This is supported by the view that economic analysis is normally conducted as part of the project feasibility study and should contain the following elements that are integrated into the overall economic analysis of the project, i.e. costs and benefits of environmental impacts, costs, benefits and cost-effectiveness of mitigation measures and discussion of impacts that have not been expressed in monetary values and in quantitative terms. ([http://www.adb.org/Documents/ Guidelines/Environmental Assessment/Content Format Environmental_Assessment.pdf](http://www.adb.org/Documents/Guidelines/Environmental%20Assessment/Content%20Format%20Environmental_Assessment.pdf)). It could therefore have been better for EIA reports to have this section of economic analysis to help developers understand that impact mitigation and management is part of the project lifecycle. All the other challenges encountered such as employing environmental officers, internal audit and monitoring etc. centered on the costs involved in their implementation. Political interference was also highlighted by NEMA's Environmental Audits and Monitoring Officer as one of the challenges to the implementation of mitigation measures. Lack of adequate resources to implement the enforcement mechanism for the implementation of mitigation measures was also highlighted by NEMA as one of the biggest challenges. Without adequate resources therefore, implementation of mitigation measures may not be possible.

3.0. Material and Methods

3.1. Data Collection:-

The study review of the Socioeconomics Impact of the South Sudan Breweries limited on Population of Janduro area was developed through analysis of secondary source data. These sources include reviewed materials present in the journal, books, national presentations, supplemented by non-peer reviewed literature from a wide range of other sources, including international and non-governmental organizations, and some commercial organizations. These sources were collected through comprehensive and extensive literature search using academic reference databases including Web of Knowledge, Science Direct and Google scholar (including databases such as aquatic science, conference papers index for life, Environment and Aquatic science, GeoRef, International Bibliography of the Social Science, Oceanic Abstracts) were all used to identify relevant literature and articles in the news line from the country. This review involved obtaining data from the past and present studies, and current literature including field visit to Janduro area, questionnaire to communities in total 50 questionnaires were administered to 50 households randomly selected in the study area. Then the results were tabulates and interpret with the excel charts, and discussed and face to face interview with government official from different ministries. The study relied on secondary data, and the data were analyzed using descriptive

methods to obtain logical deduction and sequential presentation of facts from the data obtained that gave a precise picture of the subject matter. This below show hierarchical horizontally of data collection up to results.



4.0. Results and Discussion:

4.1. First results from the visit and face to face interviews:

This information were obtained from government official in the Ministry of Environment in the Republic of South Sudan Juba, Ministry of Commerce, Industrial and Investment in South Sudan Juba, and Human Resources Department in SSBL during the visit and face to face interview with the interviewers.

i. The Republic of Sudan before the independence of South Sudan:

According to the book of Sudan-post-Conflict Environmental Assessment United Nations Environment programmer first published in June 2007 by the United Nation Environmental Programmed is said that Industry and the Environment to Assessment activities the Sudan's industrial sector is currently undergoing rapid change and expansion. Historically limited to utilities and small-scale food processing,

ii. Overview of Industry related Environmental issues:

Industry related environmental issues can be divided into those applicable to all industries issues are:

- a) Absence of environmental considerations in the development of new project.
- b) Poor environmental performance at operating sites. UNEP site are inspections revealed chronic serious environmental problems at the majority of industrial facilities visited. The issues noted ranged from air emissions and water pollution to hazardous and solid waste disposal, there was no correlation with scale: large facilities had the same performance as smaller ones, if not worse. Air and liquid discharges directly into water courses at several sites.

iii. Industrial sector environmental governance:

General industrial facilities the industry is subject to national and level environmental legislation , but the enforcement of existing laws is limited and difficult, at the national level , Sudanese industry is governed by the Environmental framework Act of 2001 .in cases it is also regulation, the need to obtain and renew operating licenses issues by state governments. While there is no specific national level statute addressing the environmental impacts of industry, individual operating permits may have provisions regarding air emissions or effluents the most direct form of environmental governance observed by UNEP during assessment was at the state level, where local complaints of large scale air and water pollution had led to action by state governor and a form of state level environmental council. In two cases reviewed (a cement factory and a tannery), the action was successful: the cement factory was upgraded and the tannery was shut down, in one other case, the facility (a lubricant plant) was resisting control.

iv. Ministry of Commerce, Industrial and Investment in South Sudan-Juba

Most of the major industries/factories were started in South Sudan since 1980s during former Sudan under the government of Sudan. Among these are two major industrial known as:-

- Anzera Agro complex – it includes the part for textiles production
- White brewery factory in Wau – it produce main products of beer to satisfy the need of the consumers.

There were also minor factories during those days like there were Wau fruits and vegetables canning factories it produced mango juices, okra can so as to satisfied needs for the surrounding populations within the town and other minor town of South Sudan. Beside these above factories, there were other factories such as Tonj, Kenaf factories which produce wooly sacks containers. Also we have Yirol oil leaf – it main products are: Oil, Groundnut oil, and Lulu oil. These were all industrial development in South Sudan since 1980s, but their operations and activities were stop by the serious war erupted in South Sudan. Following the above establishment there were proposals projects of:-

1. Mangala sugar gain project
2. Maluth sugar gain project

These two projects were not implemented and may IEA was done for they are big projects. Soon after signing of CPA in 2005, most of the industries started too emerged into South Sudan and establishment began during negotiation time in 2002 - 2008. There were no laws for establishment of industries, factories and companies until now, but the government of South Sudan (GOSS) tries to set some regulations which regard all established industries, factories and companies to register under the ministry of justice. Soon after the signing of CPA 2005 and after independence of the Republic of South Sudan most industries and companies established in Juba registered under ministry of legal affair and they must have registration certification. According to the ministry of industry national government there were competitions in companies' registrations because some of the companies \industries are now operating without consultation to national legal affairs for registrations, but latter find registered under the state government of Central Equatoria. Therefore, there is no serious inspection; companies may appear operating in surprise of national legal affair and ministry of industry and investment. Then illegal operations in a sense from two governments national and the state that it may register from other side. (SEA) Strategy Environmental Assessment in South Sudan they do not know about it.

4.2. Result from the questionnaire and shows in the below charts:

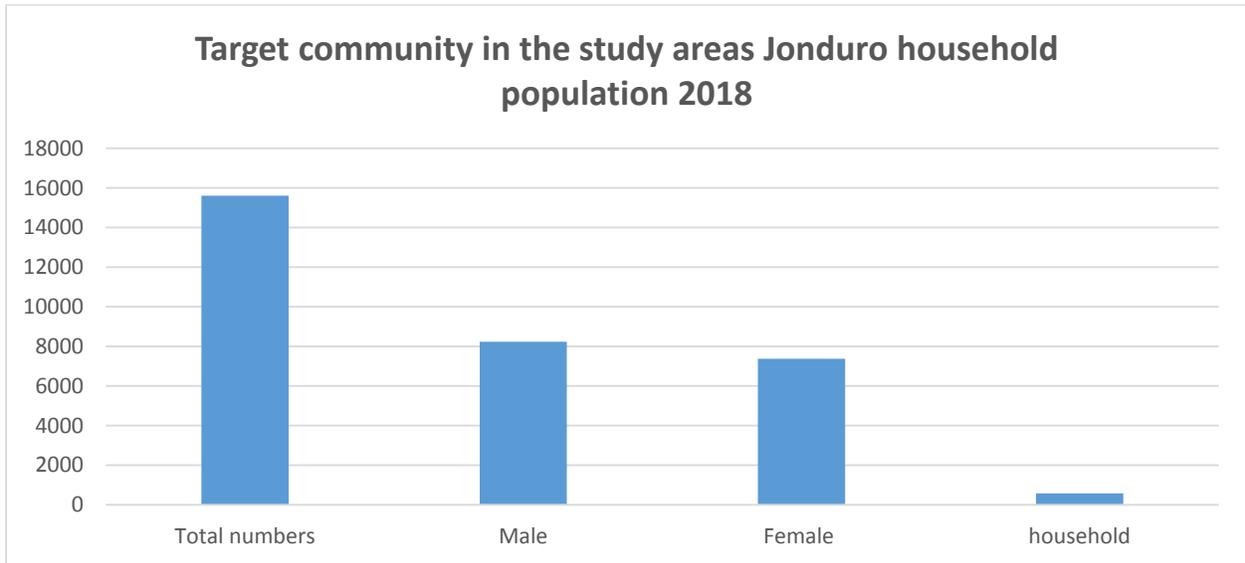


Figure 2: The total of 50 questionnaires were administered to 50 households randomly from total houses numbers 579 selected in the study area (Male are 8232, Female are 7372, and total resident numbers in the target area are 15,604).

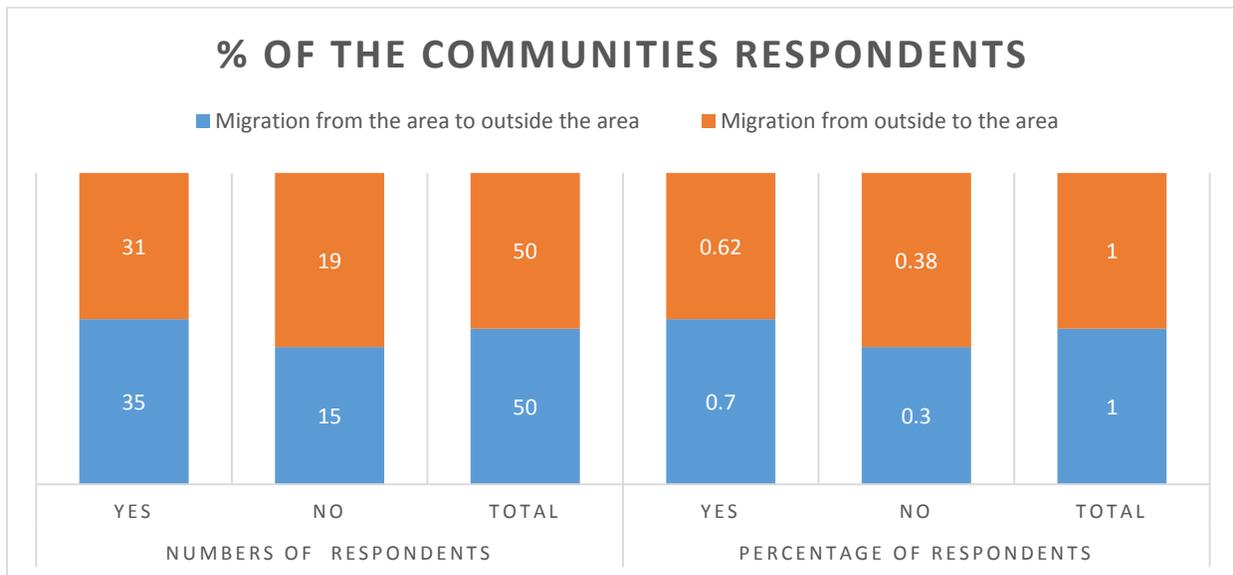


Figure 3: Number and percentage of respondents interviewed on the population composition of the local community in the study area.

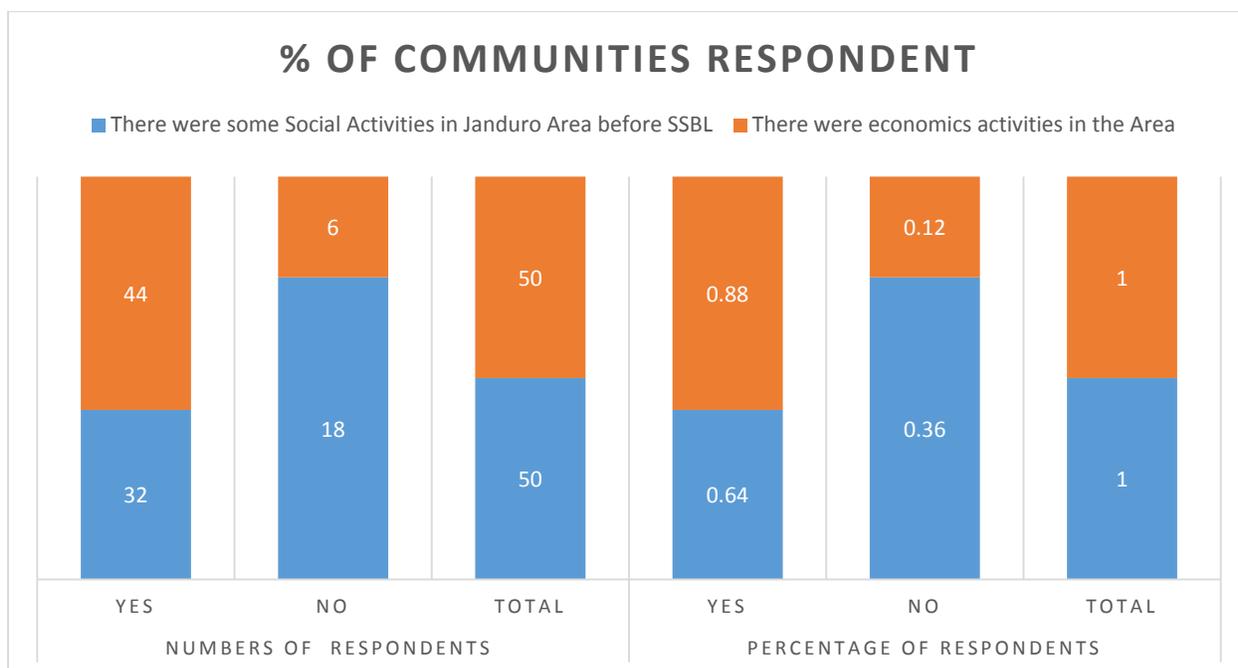


Figure 4: Number and Percentage of respondents interviewed on whether there were some Socio-economic activities in the Area before establishment of SSBL.

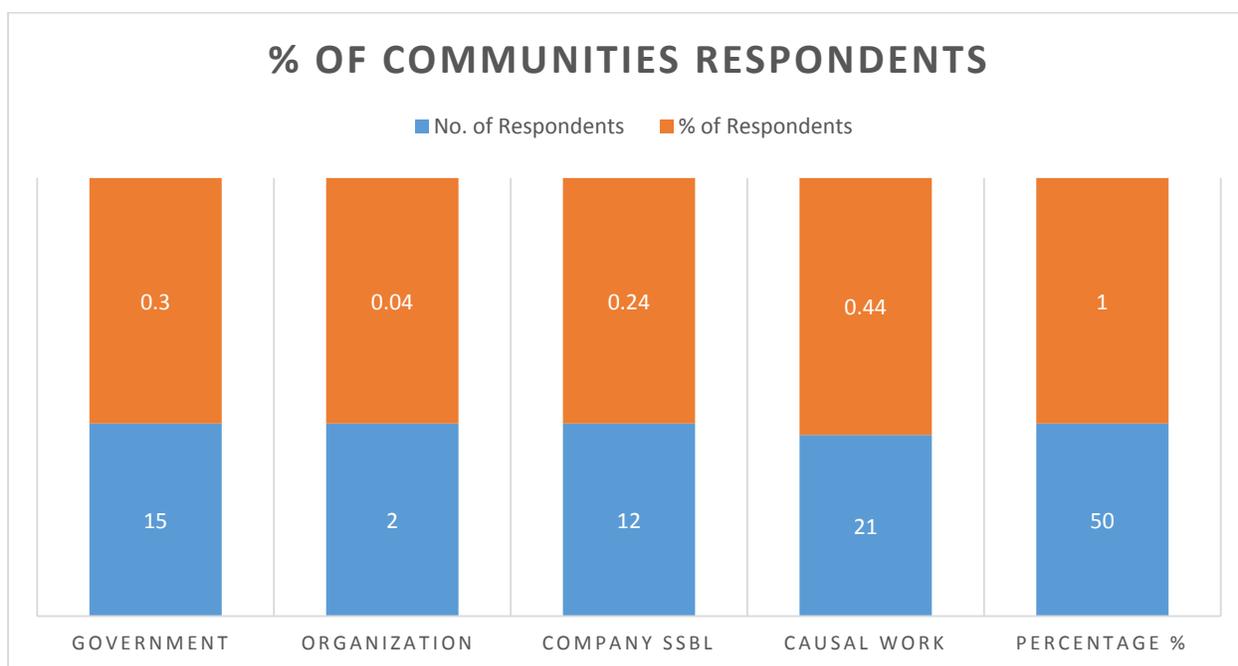


Figure 5: The types of jobs or work where people of Study Area work in.

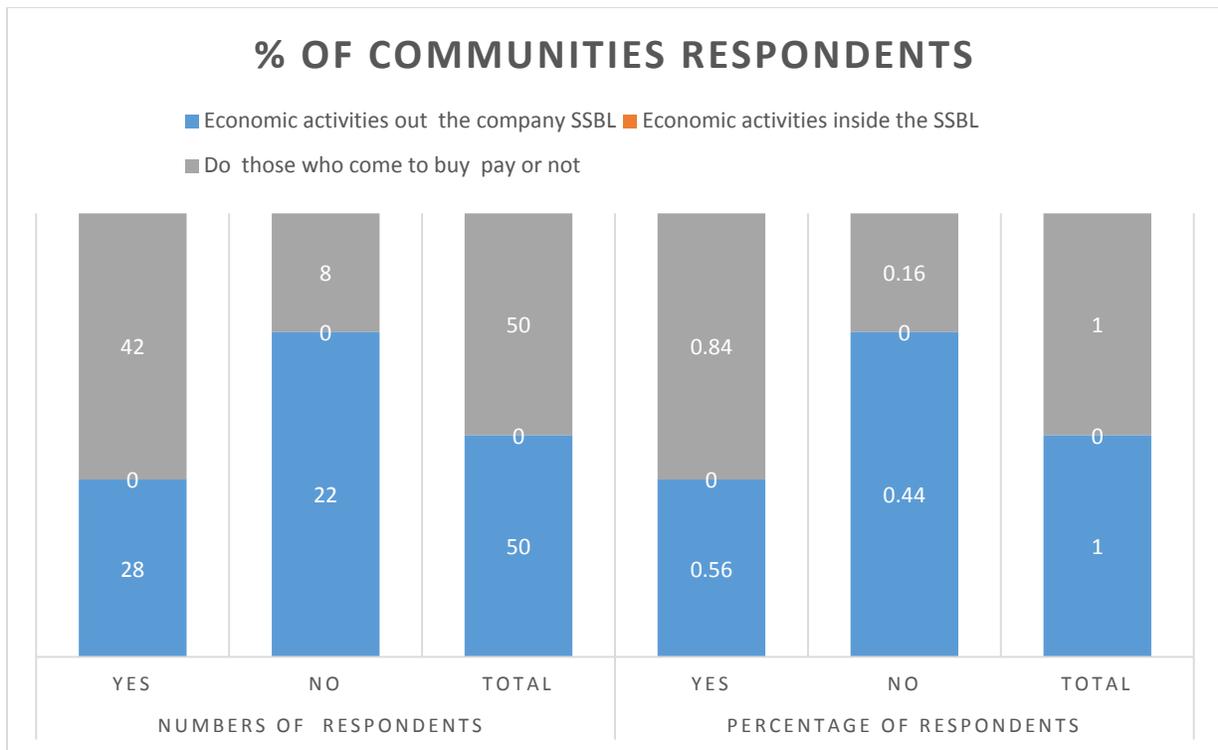


Figure 6: The existing economics activities inside and around Company.

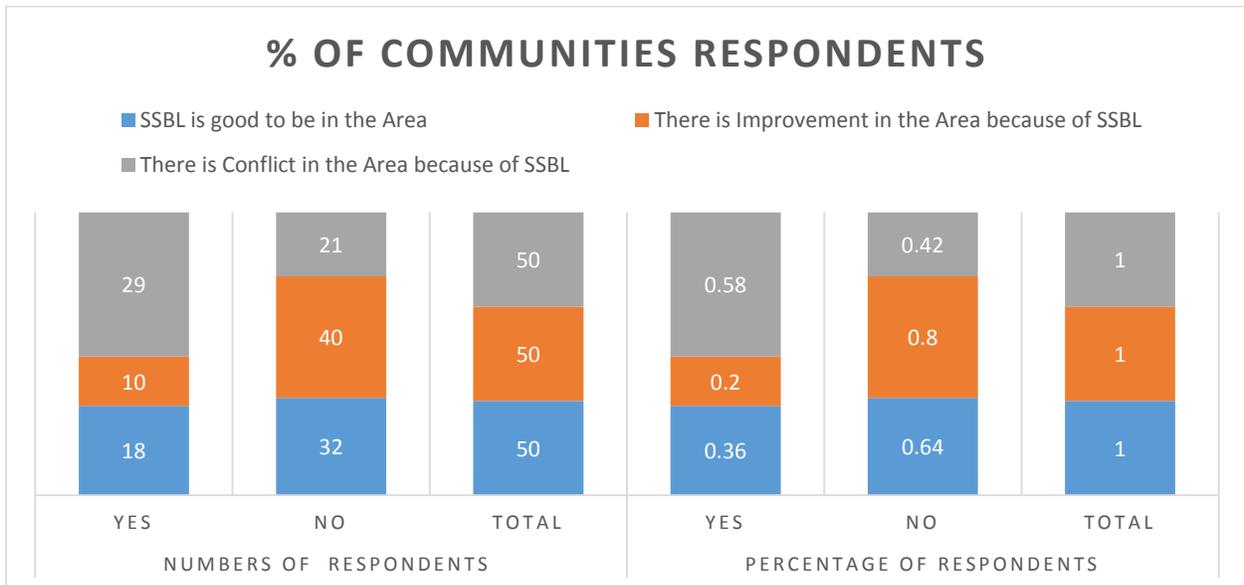


Figure 7: Number and Percentage of respondents interviewed on whether the establishment of SSBL in the Area is good or not.

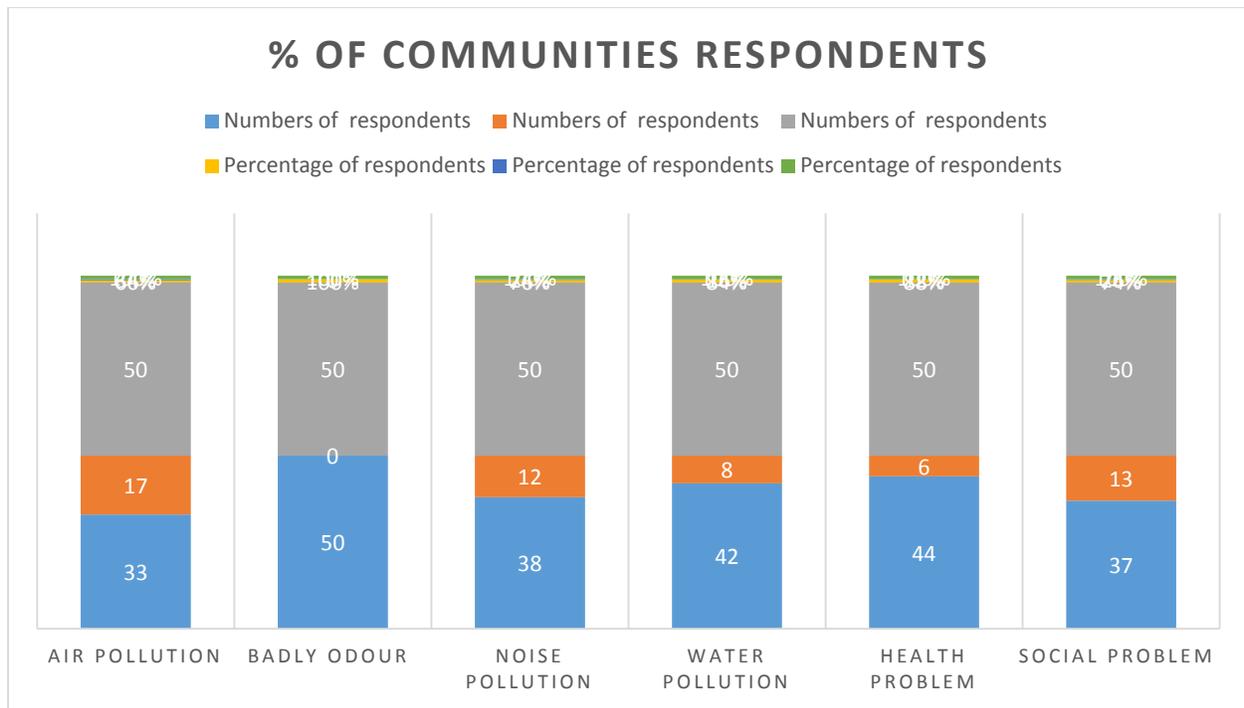


Figure 8: To investigate the health and social problem associated with the SSBL in the area of the study. The second parts of the discussion are the environmental problems or the impacts or effects on the individual communities in the area and around the company and those environmental impacts of the SSBL Company on the individual communities.

4.3.1. The Impacts of SSBL project on the Population Composition of the Local Community in the Study Area in and out:

It has been found out that in 50 houses interviewed the average household size is 7 persons per households. This means there is high/low population number in that area. The numbers of male, compared to the numbers of female, representing 26% and 31% respectively of the total population number of households interviewed while the children represents (43%) of total population of households interviewed in different ages and gender. The dominant native population is Baria tribe or communities. About 70% of the respondents interviewed agreed that there have been migration of some original communities to other areas because of establishment of SSBL in the place from where they earn their livelihood The place was a small forest and they used it for different activities like, the cultivation, cutting trees for fire woods, charcoal, and wood for building and rocks mining. Those people migrated because the company (SSBL) took the land and cut down all the trees, removed the rocks and stopped communities from obtaining their benefits from that land. While population migrated because of the planning survey in other reasons for the migration includes demarcation of the land by CES, land authority. About 30% of respondents interviewed said no impacts of the SSBL on the composition of the local communities because they are new in the area. They came after SSBL has been established. Some people came from the outside the Area to look for jobs in the company. Others live in the area and are doing some business activities around the area represents about (62%)of respondents, therefore those who said there are no people coming from outside the area of the study are about 38% of respondents refer to (figure 3).

4.3.2. Socio-economic activities in Jonduro area before establishment of SSBL:

Out of the 50 households' interview, about 64% agreed that they have experienced the impacts brought about by SSBL project on the social activities and traditions existing in the area. Accordingly, customs such as occasional gathering as groups or families and communal work by the tribes in Jonduro has been disrupted since the establishment of SSBL in the area. The community members who are working in the SSBL and other activities are too busy for such gathering, while compounded by the demarcation activities, many families are living isolated from each other. So the numbers of respondents who agree they experience impacts of company on social activities of local community are (64%) of respondents. While the discussion about the economics activities, over (88%) of respondents interviewed said that the major economics activities in the area are the small scale cultivation to provide food for local communities, others bring the produce to the market as source of income to them, there are people who used to collect firewood and made charcoal in that place of company because the place used to be a small forest they cut wood to take them to market as source of the income for them, others are doing smallest business in the area like tea making in small shops and market. At the present moment most community are (breaking rocks) mining rocks which are sold to be used in different types of building and construction in Juba Town. The economics activities in the area are Firewood collection Small bundle, Big bundle, Charcoal-burning Stone breaking or breaking of rocks from the mountains, (One truck load is equivalent to approximately seven tones or one to two , weeks of labour depending on the number of workers.), Making bricks, Smearing houses, Washing clothes, Washing dishes, Charcoal retail, (bags bought from charcoal-burners and sold at markets) Food retail Tea-making and baking, Agricultural activities in small farmers and Vegetables, Alcohol brewing and motor pikes (Boda boda). Some of those people work as blocks in the area and Juba Town. Other respondents who said no economics activities in the area before establishment of SSBL are (12%) because they were not in the area before but they came after the establishment of the company in the area. This refers to (figure 4).

4.3.3. Types of jobs or works where people of Study Area are uses to work in Juba:

The numbers of respondents who are working in different jobs said they are (58%) in general, but in detail the numbers of respondents working in the government are (30%), those who are working in the organization are (04%) respondents, while for the respondents working in the company of SSBL are (24%) respondents, also the respondents those who are not working but causal jobs in the area or around in Juba Town are (42%) respondents, so the all results are 100% percentage. About (24%) respondents of who are working in the SSBL Company. Therefore this means that there are problems of jobs in the area, the company didn't help them to find the employment, those who are the students in different levels in different schools are around 30 students and other doing smallest business in the area like making tea in small shops and market, the most communities are (breaking rocks) mining rocks to be used in the building in the area in place of sand and in other different type of building, some of those people work as blocks in the area and Juba town. (This refers to figure 5).

4.3.4. Services and infrastructures in the Study Area after the establishment of SSBL:

The numbers of the respondents said that there are local economics activities around the SSBL but not inside are (56%) and those who said No are (44 %) in the area. While the numbers of respondents over (84%) said yes for payment and while respondents who said No are (16%) for payment of money when those came to buy things. Concerning the services in the area, only water is provided by SSBL, and the government is provided schools under trees in the area and help the communities to learn almost all the people agreed with that (figure 6). So when the owners of the South Sudan Breweries Limited (SSBL) company discussed the issues of the establishment of the company and the purposes and goals of that company in the South Sudan or in Juba town especially in Janduro area block five, they both local leadership and the owners of SSBL then came out with some conditions. The conditions of the establishment of SSBL Company in area were agreed upon by the parties are:

- a) To provide opportunities of the employment to the local communities over (75%)
- b) To provide some facilities in the area and town
- c) To provide for them health care center or clinic in the area.
- d) To help them in case of building schools for their kids.
- e) To supply for them clean water and electricity in the area.
- f) To help them in making roads infrastructures of roads in the area.

The roles of the industry to local communities are providing the opportunities of job employment to our local communities and help the communities in other services in the area like above mention because any company in every place help in the improvement of the area in different ways and makes area to develop, change the behaviour of the population and bring new skills to those communities, but according to the director of human resources in the company SSBL he said that the biggest role for them is the provision of employment and then the payment of taxes to the government which facilitates the delivery of services. There has been no compensation of the local communities for their land taken by SSBL as agreed before. The company owners use to pay money of land to leaders and according to the director of the department of the human resources he said that yes there is, a number of way both to the authorities and local development committee.

4.3.5. The establishment of SSBL in the Area is good or bad in the area:

The Brewery is providing water for drinking, household work and other purpose in that area. And other services provided by the company in the area are provision of job employment to local communities and provide for the country and town sodas, beers, mineral water to help the economics of the country in different levels of business and then the payment of taxes to the government which facilitates the delivery of services. In the case of the protection the communities in the area, around from the environmental problems or impacts or effects of the company (SSBL) to the population in the area, the most communities in the area said that no any environmental protection to them in the area and according to the director of the human resources department he has said they have installed gas recovery plants and waste water treatment plants. The majority of the local population is not in support of SSBL being in the area (64%) of the respondents. However about (36%) said it is good for SSBL to be established in the area because SSBL provide clean drinking water and job opportunities. According to the interview with the director of the department of the human resources in the company he was clear that over 479 persons are from local communities and 29 persons are Experts. According to those who do not support the establishment of the company in area, a lot of the problems occurs in the area because of the company, the company didn't help in providing facilities to the area according to the agreement made before the establishment of the company with the local leadership and owners of the company to providing health care center or clinic to the area, to providing schools to local communities, providing them with electricity, supply clean water and infrastructure or construction of roads in the area and other service in the area and people of the local to be benefits from the company by provide them opportunities of job like they made with the leaders to give local communities over 75% in the case of work. This refers to (figure 7).

4.3.6. Environmental and Health Impacts of SSBL on Local communities of the Study Area:

The second parts of the discussion are the environmental problems or the impacts on the communities in the area and around the company and the major public concern about breweries has traditionally been about wastewater pollution from untreated discharges. Locally, the odor and the noise from the operation have caused public concern.

- a. The Air pollution in the area and around the company.
- b. The Odor or Smell pollution in the area and around because of the production and other wastes from the company.

- c. The Noise pollution in the area during the process and production in the company.
- d. Health problems or the health effects on communities in the area because of company.
- e. Socio-economic impacts of the brewery company in the area on the individual.

According to figure 8: the individual respondents interviewed, about (66%) said that there is air pollution in the area widely spread especially during night the smoke come up or the emission of gases is clearly and in winter seasons you will see it and feel it in the different ways those air pollution from the processes and production of beers in the brewery. While other respondents who disagreed are (34%). The resource utilization is an issue which should be seen from a sustainable development perspective, scarcity of water resources, combustion of fossil fuels, utilization of raw materials, emission of ozone depletion chemicals, CO₂, etc. Compared to other types of industries the utilization of resources is the most characteristic environmental impact from breweries and dust mainly from handling malt and adjuncts. The raw material intake and transport mainly generate dust. In addition, dust could be generated by the supply and handling of filtration aids such as kieselguhr. However, as the dust emission from these systems normally is limited by the integration of cyclones and bag filters, the emission is very restricted.

According to figure 8: the individual respondents which agreed are (100%) said that the odour (smell) pollution in the area widely especially during night the all area have smell, emission of gases in rainy season is smell even makes those whom are living there unable to sleep well. The main potential odour sources from vapours from wort boiling, wastewater treatment, storage and handling of co- and by-products, oil storage, ventilation of beer cellars and packaging lines, and stack emission from the boiler house. The main reasons for odour nuisances from location toward neighboring areas, no vapour condensing from wort boiling, Mal-operation of heat recovery system for the wort boiling, storage of by-product during summer periods, and content of sulphate in wastewater, which will cause malodors if the Wastewater becomes anaerobic.

According to figure 8: the respondents are (76%) said that the noise pollution in the area widely especially during night from heavy mechanizes which are used in the processes and you cannot sleeps well at night. So other respondents who disagreed are (24%). The noise emission from a brewery can be divided into transport noise and noise from stationary sources. Transport noise mainly comes from the distribution trucks and forklifts. From stationary equipment it is mainly noise from condensers and cooling towers that can be heard outside the brewery.

The main sources of noises are: transports within the brewery both with Lorries and forklifts, condensers and cooling towers for the utility plants, raw material transport within the brewery, and ventilation fans.

The main reasons for large noise nuisances are: location toward neighboring area, poor maintenance of outdoor equipment, and activities during night time. The environmental impact of noise emitted by the brewery should be assessed by a study of the specific emission sources. It shall be noted that noise within the brewery is also an OH&S concern in the utility areas (compressors) and in packaging areas (glass bottles). Especially when using old equipment.

According to figure 5.the individual respondents over (84%) said that the water pollution in the area widely especially passing from the company to stream through the area moving to the river Nile and some of those water there are stopped in the different place in the area with the bad smell causing some health problems because gives the insects good environment for breeding. Therefore some of individual respondents who disagreed are (16%). Water will leave the brewery as beer, as a part of by-products (brewers' grains and excess yeast), wastewater or as steam and Vapours. In areas with cold water, the water consumption is normally lower than in areas with high temperatures.

- **The largest water consuming processes are:** Mashing and sparging, cleaning of packaging material (e.g. bottle washing), pasteurization (tunnel), rinsing and cleaning of process equipment (CIP), cleaning of floors, soap lubrication of conveyors in the packaging area, vacuum pump for filler, flushing of filler, and Keg washing
- **The main reasons for high water consumption are:** High consumption of water for bottle washer, overflow in the hot water system, pasteurizers out of balance, cleaning of process equipment, water used for cooling of tunnel pasteurizer in an open system, high water consumption for vacuum pump in packaging area, low efficiency of equipment and plants, closed loop cooling system is not working satisfactorily, leaking valves, running taps and hoses, and no (or insufficient) resource management system

The wastewater discharge will be equal to the water supply subtracted the produced beer, evaporated water in brew house and utility plants, and the water present in the by-products and solid waste. Organic material mainly enters the brewery in the form of raw materials such as malt and adjuncts. In addition organic material may enter the brewery as “other input sources” consisting of cleaning additives, lubricants for conveyors and residual products in the bottles. Organic materials will mainly leave the brewery as beer, by-products and wastewater. In order to reduce the organic content of the wastewater focus must be put on the loss of intermediate products and beer and on collection of by-products. The traditional characterization of brewery wastewater is the content of organic material, which is often measured as either COD or BOD.

According to figure 8. The individual respondents which agreed over (88%) said that the health problem occurs is related to all different types of pollution in the area widely spread especially from the water passing through company to the area moving to the river Nile. While other individual respondents who disagreed are (12%).

It is well established that drinking can severely impair the individual’s functioning in various social roles. Alcohol misuse is associated with many negative consequences both for the drinker’s partner as well as the children. Maternal alcohol consumption during pregnancy can result in fetal alcohol syndrome in children, and parental drinking is correlated with child abuse and impacts a child’s environment in many social, Drinking can impair performance as a parent, as a spouse or partner, and as a contributor to household functioning. There are also other aspects of drinking which may impair functioning as a family member. In many societies, drinking may be carried out primarily outside the family and the home. In this circumstance, time spent while drinking often competes with the time needed to carry on family life. Drinking also costs money and can impact upon resources particularly of a poor family, leaving other family members destitute. Also, it is worth noting that specific intoxicated events can also have lasting consequences, through home accidents and family violence, suggests that adverse child health effects of alcohol use are primarily through two distal determinants (indirect effects) - forgone household disposable income and caretakers' time for childcare. Diversion of scant economic resources for alcohol use that could have otherwise been used for seeking health care, may lead to self-care or delay in seeking health care. The other potential ways by which alcohol use can reduce the household income are through morbidity associated with the drinking habit among the consuming individuals, resulting in increase in medical expenditures and loss of income due to lost wages, and, sometimes, resulting in the premature death of sole wage earners in a household Implicit in the habitual drinker's potential impact on family life is the fact that the drinking and its consequences can result in substantial mental health problems of family women members The effects of men's drinking on other members of the family is often particularly on their roles as mothers or wives of drinkers. The risks include violence, HIV infection, and an increased burden in their role of economic providers. In a paper that looked at alcohol and Alcohol-related problems facing women in Lesotho, it was noted that as in many other developing countries, the cultural position of women in Lesotho facilitates a vicious circle in which women are at one time brewers of alcohol, then sellers, and then become excessive consumers due to the problems created by their drinking husbands.

4.3.7. Social and economic problems are linked to alcohol:

Alcohol consumption can have adverse social and economic effects on the individual drinker, the drinker's immediate environment and society as a whole. Indeed, individuals other than the drinker can be affected, for example, by traffic accidents or violence. It has an impact on society as a whole in terms of resources required for criminal justice, health care and other social institutions. Drinking outside the home can mean less time spent at home. The financial costs of alcohol purchase and medical treatment, as well as lost wages can leave other family members destitute. When men drink it often primarily affects their mothers or partners who may need to contribute more to the income of the household and who run an increased risk of violence or HIV infection. The economic consequences of alcohol consumption can be severe, particularly for the poor. Apart from money spent on drinks, heavy drinkers may suffer other economic problems such as lower wages and lost employment opportunities, increased medical and legal expenses, and decreased eligibility for loans. Alcohol plays a role in a substantial number of domestic violence incidents, especially in the case of abusing husbands. Often both the offender and the victim have been drinking. The relationship between alcohol and domestic violence is complex and the precise role of alcohol remains unclear. Heavy drinking has been strongly linked to violence between partners and to a lesser extent to violence towards others, possibly because proximity increases the opportunities for violence. For instance, in South Sudan, 64% of the women and men who recently experienced domestic violence according survey and the questionnaire results that their partner had consumed alcohol, and there is a need to better understand the possible role of alcohol intoxication or dependence in the processes through which incidents escalate into violence. There is little doubt that alcohol consumption has many social consequences, but more quantifiable data is needed to enable meaningful comparisons between countries.

4.3.8. Social and economic costs:

Cover the negative economic impacts of alcohol consumption on the material welfare of the society as a whole. They comprise both direct costs - the value of goods and services delivered to address the harmful effects of alcohol, and indirect costs - the value of personal productive services that are not delivered as a consequence of drinking. Estimating the costs of the impact of alcohol on the material welfare of society is often difficult and requires estimates of the social costs of treatment, prevention, research, law enforcement, lost productivity and some measure of years and quality of life lost.

5.0. Conclusions and Recommendations:

5.1. Conclusion:

The Socio Economic Impacts of the industrial sector is one of the most fundamental issues that are affecting most of the people especially in the developing countries. The socio economists usually focus on the social impact of some sort of economic and social change caused about by the establishment of the industries. Such social effects can be wide-ranging in size, anywhere from local effects on a small community to changes to an entire society. This study was carried out on the socio-economic impacts of SSBL on the population of Janduro Residential Area in Rejaf Payam Central Equatoria State. Other things those population complaining a lots are about health problems from air pollution from burning solid wastes, the individuals respondents which agreed are (100%) said that the odour (smell) pollution in the area widely especially during night the all area have smell, emission of gases in rainy season is smell even makes those whom are living there unable to sleep well. The main potential odour sources from vapours from wort boiling, wastewater treatment, storage and handling of co- and by-products, oil storage, ventilation of beer cellars and packaging lines, and stack emission from the boiler house. The main reasons for odour nuisances from location toward neighboring areas, no vapour

condensing from wort boiling, Mal-operation of heat recovery system for the wort boiling, storage of by-product during summer periods, and content of sulphate in wastewater, which will cause malodors if the Wastewater becomes anaerobic. The respondents are (76%) said that the noise pollution in the area widely especially during night from heavy mechanizes which are used in the processes and you cannot sleeps well at night. So other respondents who disagreed are (24%). The noise emission from a brewery can be divided into transport noise and noise from stationary sources. Transport noise mainly comes from the distribution trucks and forklifts. From stationary equipment it is mainly noise from condensers and cooling towers that can be heard outside the brewery. While wastewater running every day from company throughout small stream passing by area to White Nile River which increase diseases in the area and the water pollution into the river. Meanwhile, the socioeconomic impacts of the brewery company in the area on the individual. For example alcohol consumption can have adverse social and economic effects on the individual drinker, the drinker's immediate environment and society as a whole. Indeed, individuals other than the drinker can be affected, for example, by traffic accidents or violence. It has an impact on society as a whole in terms of resources required for criminal justice, health care and other social institutions. Drinking outside the home can mean less time spent at home. When men drink it often primarily affects their mothers or partners who may need to contribute more to the income of the household and who run an increased risk of violence or HIV infection. The economic consequences of alcohol consumption can be severe, particularly for the poor. The relationship between alcohol and domestic violence is complex and the precise role of alcohol remains unclear. Heavy drinking has been strongly linked to violence between partners and to a lesser extent to violence towards others, possibly because proximity increases the opportunities for violence. For instance, in our country Republic of South Sudan, according to survey result 64% of the women and men who recently experienced domestic violence and because of that many children are complain about their parents of consumed alcohol, and there is a need to better understands of possible role of alcohol intoxication or dependence in the processes through which incident escalate into violence. So with all these problems local communities, stakeholders and government they are still emphasized about the improvement in the area in terms of providing job opportunities, facilities and services to the local communities from the company. Few numbers of the local population are working in SSBL. Moreover, the establishment of the company in the area has disrupted other social and economic activities previously existing in the area. The researcher also found that the establishment of the company didn't follow the usual procedures of human health, safety, and environmental issues (for examples, Environmental Impacts Assessment, Environmental Management, Strategy Impacts Assessment, Environment Assessment, Planning and Projects Management, etc.).The EIA for SSBL was not done under the supervision of South Sudan Government as an overall environmental authority in the country. The researcher, therefore strongly recommended environmental auditing for SSBL.

5.2. Recommendations:

Based on the findings of this study, the researcher recommended the following to be taken into consideration.

1. The researcher strongly recommended environmental auditing for SSBL and any company Most locate far from the residential area.
2. Increase the awareness by educating all from the grassroots up to top levels within government, stakeholders, communities and students on risk of environmental pollution and its impacts on human being health.
3. The enactment of Environment Law to regulate environment protection and management in South Sudan. The Act should be comprehensive covering the environment assessment (EA) process. Before Implementing any project for which an EIA is required, the developer must submit to the authority a Project Brief which, must include: Description of the project; location; purpose and scope of the project; potential impacts on the environment: and any such matter that the authority may in writing require from the developer.

4. That Environment Impact Assessment Studies Required under the Act must be Conducted or prepared respectively by individual experts or a firm of experts authorized in that behalf by the Authority.
5. The local population should be involved in all aspects (planning, construction, employment) of establishment of new industries. This will contribute to adding new skill for the local community in the area and training them to improve and evolve of the local communities in the area.
6. Every company have to provide opportunities of the employment to the local communities and provide facilities and others services in the area to local communities (e.g. Health Care Centre, Schools, Good roads, water and electricity in the area) based on the agreement reached between company owners and the local population.
7. The SSBL have to look for another way of management different types of solid waste rather than dumping them around the residential area which cause a lots of problems in the area such dusts, odor, noise, stream pollution ... etc.
8. The Government of South Sudan has to enact law for alcohol consumption in the country especially for drivers.
9. Cooperation between Government from national, local and environmental organization then communities to protects the human being and ecosystems.
10. Knowing the environment and what causes the problems, pollution, pollutants, effects or impacts and how to control, reduce or minimize, recycling and reuse it by understanding all these issues we will live wonderful life in this earth or world. Pollution it don't have broader so we are supposed to rethink concerning our activities (The words said: treat environment the way you like the environment to want treat you).

6. REFERENCES

- 1) A brewery is a dedicated building for the making of beer, this section does not cite any references or sources (April2012).
- 2) Bruce K. Alexander is Professor of Psychology at Simon Fraser University in Burnaby, British Columbia, Canada. A respected writer on the subject, he is the author of, among other publications, *Peaceful Measures: Canada's Way Out of the War on Drugs* (1990) and can be contacted at alexande@sfu.ca.
- 3) Environmental, Health, and Safety Guidelines for Breweries Health and Safety Commission (HSC). 2005a. Food Manufacture – Beer, Spirit and Soft Drink Manufacture. Injury Rate Comparison. London: National Statistics. Available at <http://www.hse.gov.uk/food/drink.htm>.
- 4) Impact factor: 2.946, Editors-in-Chief , Professor Jonathan D. Chick and Professor P. De Witte(ESBRA European Society for Biomedical Research on Alcoholism)
- 5) John Schlimm, Arcadia Publishing 2005 ISBN 0-7385-3843-4.
- 6) James Geary, Ethical Corporation September (2009) strategy and management. The cost benefit analysis of Beer day of download 7/01/2013 20:51pm.
- 7) J A van Oers, I M Bongers, L A van de Goor and H F Garretsen (Alcohol consumption, alcohol-related problems, problem drinking, and socioeconomic status).
- 8) Kapstein, Posted by Zahid Torres-Rahman on June8, (2011) The Socioeconomic Impact of SABMiller in Ghana: the new report by Professor Ethan.
- 9) M. Phil, Environmental Management (University of Cape Town) for Envirolution Consulting.
- 10) Malcolm Logie pr.sci.net. Managing Director: Biotechnology and Environmental Specialist Consultancy. JACQUI RAYNES MSc. Environmental Management (Environmental Manager: Africa Resources Limited) Environmental and Social Impact Assessment October, 2008 Africa Resources LTD website page 36-44.
- 11) Micro Brewer Licenses and other non-retail licenses may be directed www.michigan.gov/cis day of download 28/1/2013 22:46 pm.
- 12) Maunder w. J (1992) website.
- 13) M/s. NV Distilleries & Breweries (North East) Pvt. Ltd ENVIRONMENT OPERATIONS MANUAL.
- 14) <http://www.comesa.int/comesaqa.htm>.
- 15) <http://www.worldbank.org/pics/pid/3a63683.txt> OP 4.01, Environmental Assessment, January 1999.

- 16) **Population Projections for South Sudan by Payam from 2015 – 2020 (National Bureau of Statistics, April, 2015)**
- 17) Millet Beer Brewing and its Socio-economic role in the lives of Mafa Women in the far North province of Cameroon, Universities I Troms Ø, university of Troms Ø, <http://hdl.handle.net/10037/1627>.
- 18) Ministry of Environment of South Sudan –Juba.
- 19) Ministry of Commerce, Industry and Investment-Juba.
- 20) Pokrovskii, Vladimir N (2011) Econodynamics. The theory of social production, springer, Berlin. Socioeconomics from Wikipedia, the free encyclopedia.
- 21) SAB (the South African Breweries) for every R1 in sale revenue generated by SAB during 2009, R2 02 was added to South Africa's Gross Domestic product (GOP). website
- 22) Simon Zakaria at Simonzekaria@dowjones.com Brewers could satisfy thirst for Steady Returns.
- 23) SUSTAINABILITY POLICY AND GUIDELINES (Sustainability Policy adopted by the Board of Directors on 1 September 2011, and Exclusion List and Sustainability Guidelines adopted by the Board of Directors on 2February 2012, with entry into force as of 21 March 2012). This is the html version of the file http://www.nib.int/filebank/56-Sustainability_Policy_Guidelines-2012.pdf. Google automatically generates html versions of documents as we crawl the web.
- 24) The Brewers of Europe Guidance Note for Establishing BAT in the brewing industry. October, 2002 (CBMC) Page 7 to 25.
- 25) Track Back URL for this entry <http://www.typepad.com/services/trackback/6a00d83420c49153ef0120a6080e81970c>
- 26) UNEP SUDAN (2007) (Post-Conflict Environmental Assessment United Nations Environmental Programme) First Published in June, 2007 by United Nations Environment Programme (ISBN: 978-92-807-2702-9, Job No: DEP/0816/GE) Page 140-144.
- 27) United Nations Environment Programme (UNEP). 1996. Division of Technology, Industry and Economics (DTIE). Cleaner Production in Breweries: A Workbook for Trainers. First Edition. Paris: UNEP. Available at http://www.uneptie.org/pc/cp/library/catalogue/cp_training.htm United States Bureau of Labor Statistics (BLS). 2004a. Census of Fatal Occupational Injuries Charts, 1992–2004.
- 28) Number and rate of fatal occupational injuries by private industry sector, 2004. (Table page 10). Washington DC: BLS. Available at <http://www.bls.gov/iif/oshwc/foi/cfch0003.pdf> US BLS. 2004b.
- 29) Industry Injury and Illness Data – 2004. Supplemental News Release Tables. Table SNR05: Incident rate and number of nonfatal occupational injuries by industry, 2004. Washington D.C.: BLS. Available at <http://www.bls.gov/iif/oshwc/osh/os/ostb1479.pdf>
- 30) www.climatemaps.com,2012
- 31) WBCSD-SNV Alliance: Creating inclusive business opportunities by linking local communities with big business Posted on October 01, 2009 at 06:34 PM in Food and Beverage, Impact assessment, Reports | Permalink.

Acronyms/Abbreviations

ATIA: African Trade Insurance Agency

CES: Central Equatoria State

CPA: Comprehensive Peace Agreement

EIA: Environmental Impact Assessment: Comprehensive analytical effort designed to anticipate

Environmental impacts of major projects having the potential to have significant, diverse and irreversible impacts on the natural environment and on humans dependent on that environment

EIS: Environmental Impact Statement: Comprehensive analytical effort designed to anticipate environmental impacts of major national activities affecting the global commons outside of the jurisdiction of any nation.

EMP: Environmental Management and Monitoring Plan: Systematic program designed to prevent, mitigate and monitor anticipated environmental and related human impacts of prospective and ongoing activities. Sometimes called an Environmental Action Plan (EAP)

ER: Environmental Review

ERA: Environmental Risk Assessment: An instrument for estimating the probability of harm

Occurring from the presence of dangerous conditions or materials at an installation. Risk represents the likelihood and significance of a potential hazard being realized.

EAP: Environmental Action Plan: An instrument, which provides details of the measures to be taken during the implementation and operation of a project to eliminate or offset adverse environmental impacts or to reduce them to acceptable levels.

Included are the actions needed to implement them.

ISO: International Organization for Standardization.

RSS: Republic of South Sudan

SSBL: South Sudan Breweries Limited

SEA: Strategic Environmental Assessment (in South Sudan)

SPSS: Statistical Package for Social Scientists.

UNEP: United Nations Environments Programmes.

UNCED: United Nations Conference on Sustainable Development

Evidences pictures below are Shown Some Environmental Pollutions and Health Problems Facing the Population in Janduro Area and how the company of SSBL has made communities in the area and in Juba Town to Suffer from effects of pollution and some environmental impacts.

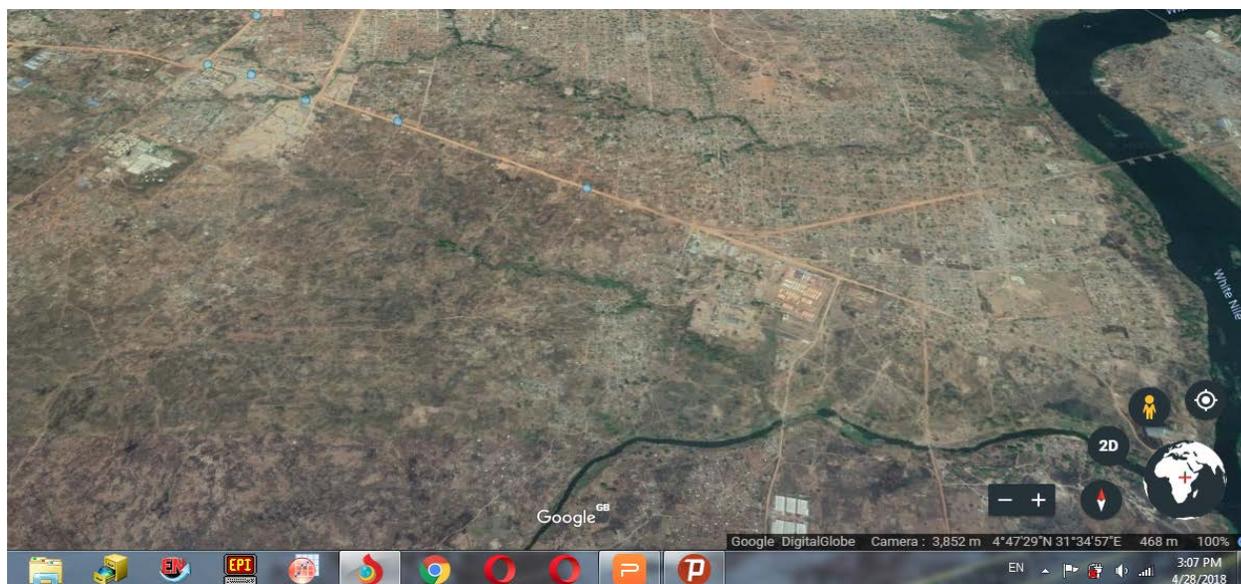


Plate 1. Shows the distance of SSBL from Nile River and small stream moving wastewater into the River



Plate 2. Shows the wastewater running through the residential area relate to increase of bleeding of insects in the area and water pollution in the River



Plate 3. Shows the burning of wastes which can increase of air pollution and health problem to local communities



Plate 4. Shows the Random dumping of different types of solids waste within the area at behind the SSBL



Plate 5. Show the random dumping of solid waste from ram material after production processes within the residential or at northern east site of SSBL



Plate 6. Show the random dumping of solid waste from ram material after production processes within the residential area of Janduro and Juba town at the north site.