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BLUE ECONOMY INFRASTRUCTURE DEVELOPMENT AND SECURITY: A CASE STUDY OF KENYA'S LAKE VICTORIA

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ABSTRACT

The blue economy is considered as sustainable utilization of oceanic resources for improved livelihood, economic growth, and job creation while ensuring that the health of oceanic systems has been preserved. In Kenya, the blue economy refers to all activities that relate to coasts, seas, and oceans. This study analyzed Kenya's Lake Victoria and attempts by the Kenyan government to develop its blue economy through the establishment of the lake's infrastructure. Lake Victoria's shoreline is one of the most congested and highly populated regions in Africa content with complex security issues. Security problems such as terrorism, piracy, and insecurity continue to threaten the overall sustainability of Kenya's ministry of tourism. Therefore, international cooperation is one of the ways that can help counter-terrorism. This paper reviewed some of the major challenges that Kenya is facing in its attempt to develop a blue economy in Lake Victoria. Light was also shed on the blue economy infrastructure development as well as security initiatives that were already in place around the lake region. Implications for the development of a blue economy in the area were also reviewed. Further analysis of the role of the private sector in necessitating the development of the blue economy was also covered. Finally, the paper offered insights on how the Kenyan government through its county governments in collaboration with businesses had implemented successful measures aimed at developing blue economies. The core finding was that the development, expansion, and establishment of Lake Victoria's blue economy should be guided by economic capacity-building rationales and security measures. The region's blue economy should be strengthened to meet the needs of both the locals and the country as a whole.

Key Words: *Blue Economy, Oceanic Resources, Lake Victoria, Sustainability of Ministry of Tourism, Blue Economy Infrastructure Development, Security*

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INTRODUCTION

This research report examined Kenya's Lake Victoria, using a case study to analyses how Kenya plans to develop its blue economy through the development of the lake's infrastructure. The Lake Victoria Basin is one of the most economically productive regions in Africa, and is home to a large proportion of Kenya's population (Brume-Eruagbere, 2017). The Lake Victoria Basin's blue economy infrastructure development and security is a case study that should be studied in the pursuit to establish sustainable economic and environmental policies for the future. The Lake Victoria Basin is the most economically active region in East Africa. It has a population of over 30 million people with an annual GDP of USD 164 billion. The Blue Economy Infrastructure Development and Security project is a multi-stakeholder initiative led by the United Nations Environment Program (UNEP), Global Environmental Facility (GEF), and International Union for Conservation of Nature (IUCN). The goal is to develop sustainable blue economy infrastructure, including parks, protected areas, and marine fisheries management.

There are many challenges affecting the Lake Victoria ecosystem. Over-fishing, pollution from human activities, climate change, invasive species, deforestation among others are major threats to this fragile ecosystem. The lake is a source of wealth for Kenya. It contributes to Kenya's economy in multiple ways. For example, it provides employment- at least 85,000 people in Kenya work either directly or indirectly from the lake. The lake is also a source of food and water- there are at least 200 species of fish living in its waters and many more animals depend on the lake for their survival (Brume-Eruagbere, 2017). Lastly, Lake Victoria is a source of culture and heritage- it has been home to some unique fishing communities who have depended on the lake for generations. This case study will focus on the development and security challenges posed by Kenya's Lake Victoria, which could be solved with blue economy infrastructure projects that can meet both social and economic needs.

The African continent is rich in water resources. In Kenya, Lake Victoria is the country's most important source of freshwater, home to a thriving fishing industry and a key contributor to the national economy. The Blue Economy is an economic system that focuses on managing marine and coastal resources for sustainable growth and development. It encourages sustainable practices like fisheries management, tourism development, marine pollution prevention etc. The Blue Economy will play an increasingly important role in Africa's future development by creating jobs, generating revenue and boosting trade opportunities (Brume-Eruagbere, 2017). The Lake Victoria Basin is one of the world's most important fisheries. The livelihoods of over 50 million people depend on it, with Kenya alone hosting more than 40% of the population. The lake has been facing ecological challenges for decades, following an explosion in human population growth and environmental degradation. These factors are threatening the Lake's blue economy infrastructure development and security, which is vital to Africa's economic growth.

The project will also reduce piracy incidents, illegal fishing, and smuggling in Lake Victoria which are putting a strain on local fishers' livelihoods and implemented in collaboration with various stakeholders including the government of Kenya, private sector businesses, civil society organizations, academic institutions and international organizations. The blue economy is an emerging development strategy for the conservation and sustainable use of marine, coastal, and lake ecosystems. Lake Victoria is Africa's largest lake, which has sparked economic interest among countries surrounding it. However, this has also caused concern about how the resource will be managed in a sustainable way for future generations.

Lake Victoria is one of the most important water resources on the African continent. It is the source of energy and food for millions of people living around it. The blue economy as a concept has been gaining momentum globally as a means to address issues such as poverty and climate change, which are some of the biggest challenges that we face today. The growth in recent years of fish populations in Lake Victoria has had adverse effects on its ecosystem, such as increased pollution and hindering fish populations from growing back. This article discusses how Kenya's Lake Victoria is being used to address these challenges using Blue

Economy Infrastructure Development and Security through research efforts to augment fish stocks in Lake Victoria (Brume-Eruagbere, 2017; Bruno & Giacomo, 2016). One of the major challenges in Kenya has been inadequate infrastructure to support the needs of the population. The increased population in Kenya has led to the demand for blue economy infrastructure development. Lake Victoria is Kenya's primary source of water and livelihood. The increased population has led to over-fishing, pollution of the lake, and other environmental challenges.

Two new pieces of legislation are being proposed to ensure that the Lake remains sustainable for future generations - the Lake Victoria Management Plan (LVMP) and the Lake Victoria Law. These two pieces of legislation will help pool resources towards ensuring that the lake is not only sustainable but also utilized in a way that will create economic growth for all Kenyans. Lake Victoria, the third-largest freshwater lake in the world, is a central part of Kenya's economy and society. It covers an area of 616,000 square kilometers (238,000 sq mi) with a shoreline of 2,132 kilometers (1,338 mi). The lake is shared among three countries: Uganda (33% of the perimeter), Kenya (55%), and Tanzania (12%) (Bruno & Giacomo, 2016). The blue economy has been an integral part of development strategy in Lake Victoria Basin countries. It is a concept that integrates development through use of aquatic resources to help manage the challenges of climate change and provide sustainable livelihoods for millions living on or around water bodies.

The blue economy can be defined as the sustainable use of the oceans, seas, coastal and inland waters, and the capture of value from them. It is an ecosystem that includes fishing, aquaculture, marine transportation, tourism, energy production and wastewater treatment. An important component to Kenya's blue economy is Lake Victoria which provides freshwater for more than 30 million people living in Uganda, Tanzania and Kenya. Lake Victoria also has a vibrant fishery sector with over 500 fishing communities relying on it for their livelihoods (Bruno & Giacomo, 2016; Abutabenjeh & Jaradat, 2018). Lake Victoria has been historically exploited by industries such as oil exploration companies who have caused conflicts with local communities over resources allocation. Nevertheless, the lake has seen recent investment in infrastructure development by both indigenous firms and multinational companies that provide cleaner sources of energy including solar power systems. In Kenya, Lake Victoria is home to a blue economy infrastructure development project which aims to improve access to education and health services through supporting fisheries. The project also aims at improving socio-economic benefits from the lake by creating jobs in tourism and business opportunities for fisher folk. The project has been successful in encouraging sustainable livelihoods through its various initiatives, such as community-based organization support, small scale enterprise support and conservation programs.

In this case study, we will explore how Kenya's blue economy initiative seeks to improve quality of life by providing opportunities for locals living around Lake Victoria. This paper argues that the Blue Economy can be a sustainable economic engine for Africa that will lead to the eradication of poverty. However, to succeed, also other sectors need to be strengthened. For example, infrastructure should be developed and security has to be improved. The Lake Victoria region provides an example of how this could happen. The rapid urbanization and economic growth in Kenya has led to increased water demand, pollution, and energy shortages. Lake Victoria is the country's most important resource because it provides more than half of the country's fresh water.

Statement of the problem

The Kenyan shoreline of Lake Victoria is one of the most congested and densely populated regions in Africa, with complex security challenges. It is among one of the poorest regions in Kenya and East Africa. This region has an estimated population of over 4.5 million people residing within the Lake Victoria Basin (LVCeb) (2017). Water security is a major challenge for the countries that rely on Lake Victoria for their water supply. A Case Study of how Kenya's Lake Victoria plan seeks to address the key questions

surrounding water security. It is designed to promote regional development and productivity, as well as ensure that there is a sustainable supply of water for future generations.

Security has been a major concern in Kenya, with conservation efforts being hindered by illegal fishing and other illegal economic activities. A study done on Kenya's Lake Victoria sheds light on the security concerns of blue economy infrastructure development. The study found that overfishing is a security threat to development in the lake (Abutabenjeh & Jaradat, 2018). The success of Kenya's Blue Economy and its economic stability depends largely on the security of Lake Victoria. It also depends on stable relations with neighboring countries such as Uganda, Tanzania, and Somalia. Maintaining the security in these countries will help ensure Kenya's stability and will be a big step towards achieving their goal for a prosperous blue economy.

It is necessary for the government and other stakeholders in the Blue Economy Infrastructure Development to take measures that will ensure security around these resources. Security is a major concern for Kenya's Lake Victoria. There are a variety of threats that have been identified that could negatively affect the welfare of people who live near or use Lake Victoria (Abutabenjeh & Jaradat, 2018). These threats range from bio-security to cyber-security and it is important to think about these factors when developing projects on the lakefront.

Research Objectives

The general objective of the study was to explore the impact of infrastructure development on exploitation of blue economy for socioeconomic development in Kenya's Lake Victoria. The specific objectives were:

- To determine the major challenges in developing a blue economy around Lake Victoria Basin
- To evaluate the Blue Economy Infrastructure Development and Security Initiative around the lake
- To ascertain the implications of developing blue economies in Lake Victoria Basin
- To check the role of the private sector in developing blue economies around Lake Victoria Basin
- To determine how can Kenyan National and County governments and businesses are successful in developing blue economies

LITERATURE REVIEW

Theoretical Framework

The most recent structural change theory is the Lewis model, which proposes that changes in economic structure are driven by technological innovations. Technology can be seen as both a cause and effect of economic restructuring (Adi, 2009; African Union, 2013). The Lewis model argues that structural change starts with the displacement of an old technology by a new technology. Displacement is followed by mutation, in which new technologies expand to take over activities previously done by the displaced technology. The advances in digital technology have created opportunities for transformation in Kenya's economy through Blue Economy infrastructure development and security initiatives. This transformation will change Kenya's agricultural sector, fisheries sector, tourism sector, and shipping industry where marine transport will become more efficient with digitization of data across nodes on the supply chain.

The Lewis model is an economic theory that discusses the possible structural change of an economy. It states that there are five different stages of development; each with its own sets of challenges and pitfalls. The model has been used in many countries including Kenya, which has used it to explain how its economy has changed over time. The paper will discuss these changes in more detail by focusing on the current status of Kenya's Lake Victoria. The structural change theory as per the Lewis model is a much-detailed account of how countries go through various stages to reach an industrial economy. Briefly summarized, Lewis' Structural change theory argues that changes in the economy are caused by an interaction between economic forces and production factors (African Union, 2013).

This report explains how structural change theory as per the Lewis model contributed significantly in Kenya's economic development. Kenya's Lake Victoria is one of the best examples for this theory because it has undergone significant changes in terms of infrastructure development due to this theory (African Union, 2013). The structural change theory by Lewis states that there are four types of infrastructures which are needed for an economy to grow. These are financial, social, physical and informational. Some of the economic benefits that Kenya has gained from developing Blue Economy infrastructure include reduced poverty rates, increased GDP per capita and increased employment opportunities.

Conceptual Framework

The conceptual framework is a diagrammatic representation of the explanation of the relationship between variables in the study. It is an instrument that is employed to create awareness and understanding of the condition being examined and to communicate it with clarity. In this study, independent variables are strategies or acts to produce changes and dependent variables as the benefits.

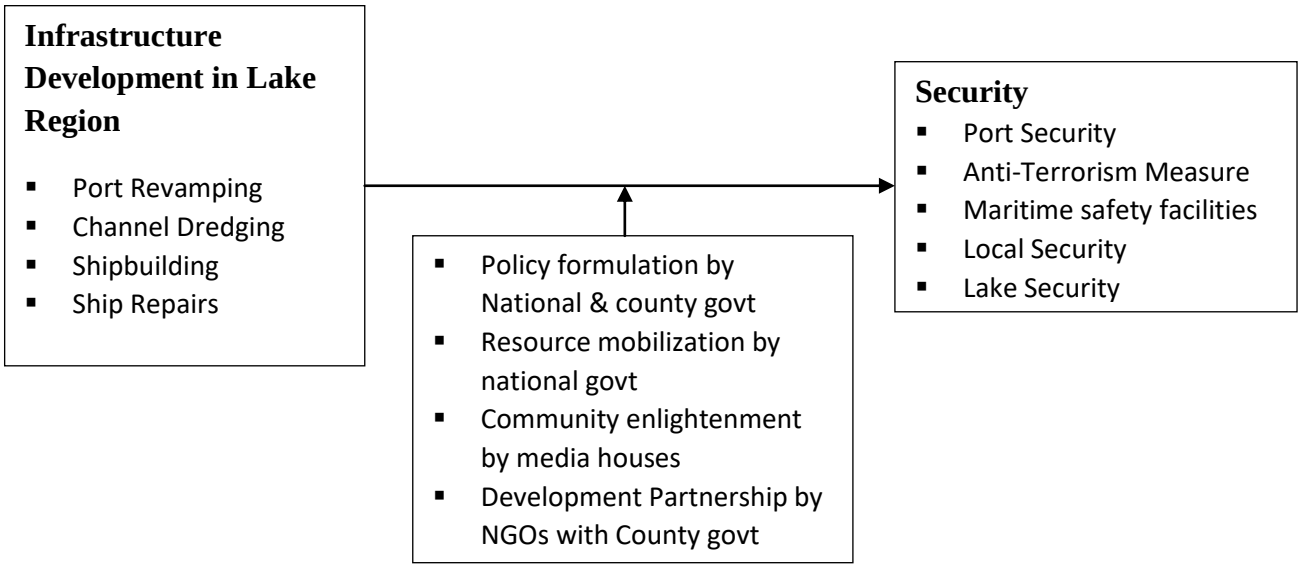

Figure 1: Conceptual Framework
Source: Researcher, 2021

Nature of Infrastructural Development in Lake Victoria

Infrastructure development in the Lake Victoria region is often overlooked when international donors invest their resources elsewhere. However, there are many benefits to infrastructural investment in the Lake Victoria region (Abutabenjeh & Jaradat, 2018). It could lead to improved security, increased trade, increased regional stability and increased quality of life for its residents. With the new development plan for this region, Kenya aims to address the environmental and social issues of this region by investing in Blue Economy infrastructure projects. These projects will have a positive effect on the security of Lake Victoria as well as provide many economic opportunities for residents on both sides of this lake. Infrastructural Development is a key factor in the management of Lake Victoria. The Lake Victoria basin covers more than one-third of Kenya's land mass and has a population of about 25 million people.

The report provides a clear introduction to the role that infrastructures play in nature and discusses how they can be utilized to provide benefits for all those living in this particular region. It also gives a detailed look at why it is so important for countries across Africa to have policies that put an emphasis on sustainable practices as opposed to those who do not care about environmental impacts or sustainability. It is clear that there are many benefits to building infrastructure in Lake Victoria (Abutabenjeh & Jaradat, 2018). The lake

presents the perfect opportunity for sustainable development, with its large expanse of water and abundance of renewable resources. This is critical because many Africans depend heavily on the fishing industry as their main source of income, and without it they would be at risk for poverty and hunger. Lake Victorians are looking to the Kenyan government to take this initiative because they believe that if it were done correctly, that not only would Kenya's economy be better off but also many neighboring countries like Tanzania could benefit as well.

Shipping, Ports and Transportation

The transportation of goods around the world requires, among other things, efficient methods of shipping. For this Kenya relies on the services offered by the ports both on and near Lake Victoria. Ports play a vital role in both international and domestic trade by enabling goods to be transported to various destinations. Ports are used for loading and unloading of ships (Abutabenjeh & Jaradat, 2018). With regard to Lake Victoria ports, it can be noted that Mbita port has capacity for ship cargo capacity but is not functional at the moment due to ongoing rehabilitation work. The port that is currently functioning is Kisumu port which has a capacity of 1 million metric tonnes per annum (MTPA). The construction work at Mombasa port is ongoing with an estimated completion date in 2020. This will increase Kenya's cargo shipment capacity. The transportation of goods is very important in the growth of any country. With it, growth can be enhanced. The same thing applies to Kenya's Lake Victoria. Kenyan ports and transportation system are essential in transporting goods from one point to another in an effortless manner.

The transportation of goods on Lake Victoria has been a matter of debate for quite some time now, especially after the construction of the Uganda Railway System in 1896. This system connected Mombasa to Kampala and was constructed to bypass British East Africa Company's existing railway line from Kisumu to Lake Victoria at Port Bell. The most important ports in this region are located on Lake Victoria which include Port Bell in Kenya, Mwanza Port in Tanzania and Entebbe International Airport which serves most flights linking Lake Victoria with other parts of the world. Lake Victoria is the largest fresh water lake in Africa and the second largest on the continent (Abutabenjeh & Jaradat, 2018; Adi, 2009). The shipping, ports and transportation of Kenya's Lake Victoria are essential for its economy. It has three major port cities; Mombasa in the south, Kisumu in the West and Jinja in the East. These cities are separated by about 500 kilometers (310 miles). Lake Victoria's ports play an important role for Kenya's economic growth and they are key to trade links between East Africa and international markets.

Kenya's Lake Victoria is an inland sea that provides the country with the majority of its fresh water. It also houses many of Kenya's major ports and transportation centers. The Lake Victoria area is home to over 26 million people, making it one of Africa's most densely populated regions. In recent times, the shipping industry has been faced with major challenges due to increasing demand from shippers and customers across Africa for cheaper freight rates, time efficiency and better customer service. In order to keep pace with this demand, shipping companies have invested millions of dollars into building new ports along Lake Victoria's shores as well as upgrading existing ones by acquiring larger vessels. Lake Victoria is a major source of transportation for Kenya (Adi, 2009; African Union, 2013). The lake is the second largest freshwater lake in the world and it connects to other smaller lakes through waterways. There are five ports on Lake Victoria and they handle over 70% of Kenya's marine transport. The lake also transports petroleum, fertilizer, and other commodities such as sugar, maize, sorghum and beans. It is by far the most important transportation route for goods from cheaper regions towards more expensive regions such as Mombasa or Nairobi. However, the infrastructure may not be able to keep up with demand because an estimated 40% of goods transported go through small scale informal operations which do not have access to port facilities or trucking routes, resulting in higher prices.

Kenya shares Lake Victoria with Uganda, Tanzania, Rwanda and Burundi. Apart from its importance for biodiversity conservation, the lake provides economic benefits through fishing, transportation and port

development (African Union, 2013). Lake Victoria provides transport for cargo, raw materials and passengers that are destined for East Africa's regional economies. Kenya's ports are among the most important in Africa, due to their close proximity to Lake Victoria and its tributaries. The government has now invested in making it accessible through building new roads, railways and other infrastructure that will link the lake with Kenya's other ports on the coast. This has been an immense undertaking that required significant investment from both the private and public sectors.

The lake also supports other industries such as small-scale commercial farming of crops like rice, bananas and papaya, tourism with thousands of visitors coming every year to enjoy its scenery or take boat trips on its waters. The Lake Victoria is a fresh water lake which is located in Africa. It consists of two parts, the African and the central. The African part of the Lake Victoria is a part that borders Tanzania, Uganda and Kenya. The Lake Victoria has an approximate length of 370 miles and it has an average width of about 55 miles. Its economic importance as a source of protein from fish stocks as well as a tourist destination has been recognized for many years.

Waste Management and Pollution Free Lake

The government began to clean up Lake Victoria back in 1998 with a big success story in 2003 when Lake Victoria's water quality reached the World Health Organization's recommended level for safe drinking water during dry season months. In response to these challenges, a group of Kenyan NGO's teamed up to create a waste management and pollution-free lake at Lake Victoria in Kenya (African Union, 2013). The project was led by the African Conservation Foundation (ACF), which created a floating garbage dump in Lake Victoria that separates solid waste from water using natural currents. The project aims at solving the problem of creating more jobs for fishermen who have been affected by climate change and commercial fishing restrictions.

In 1982, the Tanzanian government decided to regulate Lake Victoria in order to clean up its water and prevent pollution from entering the lake. They introduced strict regulations that prohibited people from dumping waste into the lakeshore, which was mostly controlled by local communities and individuals. Lake Victoria is a freshwater lake in central Africa, and the largest lake in the Great Lakes of East Africa. As a result of deforestation and overfishing, pollution has become a serious environmental problem. The construction of Harbor Bay Lagoon (HBL) started in 2009 as an attempt to turn Lake Victoria into a pollution-free lake by providing waste management and sewage treatment facilities to local communities.

HBL is the world's first artificial lagoon which was built on Lake Victoria for waste management purposes. It was built with approximately US$150 million investment, which made it one of the largest civil engineering projects undertaken in East Africa at that time. The project also involved a sewage treatment plant near its north shore. The Lake Victoria Pollution Free Project is a Kenyan initiative to restore and conserve the natural features of Lake Victoria (African Union, 2013; Al Mamun et al., 2014). The project has helped reduce air and water pollution, which has immensely improved the health of the lake. The project has also led to an increase in tourism, which is the most important economic activity in Kenya. Waste Management The idea of recycling and waste management is not new in Africa but has only recently been applied on a wider scale by governments and NGOs. This was due to increased awareness about waste management from all over the world. Waste management also leads to job creation with people hired for processing wastes or recycling them into different products or materials for reuse or sale.

Maritime Safety and Regulatory Enforcement

A number of general safety concerns exist in regards to the water transport network in Lake Victoria. These include existing navigation aids system not fully operational, lack of clear navigation routes, existing navigational charts are outdated, inadequate training of ship crew, inadequate patrols by security personnel, frequent failure of vessels/equipment due to age, inadequate lifesaving equipment, lack of search and rescue

staff, services and equipment, meteorological forecasting is often inadequate or wrong. Lake storms and tornadoes are often not forecasted before the event (Al Mamun et al., 2014).

As regards safety, there is currently a project implemented named "Maritime Communications for Safety on Lake Victoria Project" (MCSLV). The overall goal of the MCSLV project is to reduce fatalities and loss of property arising from maritime incidents and accidents on the lake through the establishment of an effective search and rescue organization. The initiative seeks to promote an enabling environment for investments in lake transport in Lake Victoria. It comprises three key components, namely; extending communication coverage over the entire lake surface, establishing one maritime rescue coordination center (MRCC) for Lake Victoria in Mwanza, putting up 16 search and rescue stations around the lake.

One of the most critical issues related to water infrastructure services in Lake Victoria is compliance with the acceptable levels of safety. A legislative framework that will handle the registration of ferries/ passenger vessels operating in the lakes is of utmost importance in a bid to regularise the vessel operations in the lake. This would entail a strict adherence to the regulations and be complied with before issuance of any certificates (Al Mamun et al., 2014; Amarh, 2019). The construction process, from the submission of plans for approval to the actual monitoring of the building of the vessels, should be carried out under the supervision of a classification society. This calls for a surveyor either of the Administration or from surveyors of recognized classification Societies examining the compliance of statutory requirements (e.g. fire protection, life-saving appliances, communication equipment, freeboard and stability, the safety of navigation). The requirements set by the Lake Victoria Transport (Maritime Safety) Regulations consist of an adequate framework.

Safety plans on board also entail lifesaving appliances always in good condition and available to every person on board. Available signs on board and crew should indicate and assist on their proper use. For purposes of search and rescue efforts, Communication equipment should always efficiently allow for communications with land and among other vessels. Navigation charts are a key asset to vessels in the lake. Passenger vessels therefore should be supplied with updated maps and navigational equipment (lights, sound signals) to eliminate the risk of grounding and collision. To ensure strict adherence to safe navigation and security in the lake, KMA should enforce compliance with requirements by periodically inspecting the vessels while on the port.

Impact of Water Infrastructural development on the maritime security on Kenya's Lake Victoria

The relationship between infrastructure and economic growth is quite complex. Although infrastructure development is important and necessary for industrial take-off and economic growth, the desire for growth does not necessarily mean higher or increased need for infrastructure and more infrastructure does not necessarily guarantee more economic growth (Romp and de Haan, 2005).The success or otherwise of social and economic development process depends largely on the available resources and an enabling environment. Maritime security arrangement therefore plays a crucial role in nurturing economic development of the lake region.

Illegal, Unreported and Unregulated (IUU)

Illegal, unreported and unregulated (IUU) fishing in Lake Victoria has been a major environmental issue for the past few decades. It is an economic problem that is not being solved by any country in the region because of corruption, lack of coordination, and lack of resources. IUU fishing poses a threat to the livelihoods of fishermen who depend on small-scale fisheries for their income. The practice also causes exponential damage to Lake Victoria's ecosystem. The people who are most severely affected are usually lake fishers living in poverty. They are marginalized because they don't have the means to compete with IUU fishing vessels that are more expensive and technologically advanced. Local governments need to take urgent action to stop IUU fishing in order to reduce poverty levels among lake fisher communities

Lake Victoria is the second largest lake in Africa and one of the most fertile fishing grounds. IUU fishing has caused many problems for the Lake Victoria fishers, who are trying to make a living. The illegal fishing damages the ecosystem and damages the economy of some African countries. Illegal, Unreported and Unregulated (IUU) fishing is one of the biggest threats to Lake Victoria's sustainability (Amarh, 2019). It's estimated that over 50% of fish caught in the lake are illegally caught, which means it doesn't have any regulation or oversight by local fisheries departments. This creates a tremendous economic loss for fishers who are following the law while also not providing enough food for people living around Lake Victoria.

IUU fishing in Lake Victoria has involved the use of fishing vessels from across the lake, employing methods such as dynamite, cyanide and poison to catch fish. Though most of these boats are registered in one or more of the countries around the lake, their activities are unmonitored and unregulated by any regional fisheries management authority. Lake Victoria is the largest lake in Africa (Amarh, 2019). The area also hosts many marine species. However, there are threats to its sustainability due to illegal fishing. There are over 50,000 boats illegally fishing in the lake, but only 19 have been confiscated so far. Illegal Unreported and Unregulated (IUU) fishing is a major issue for Lake Victoria which has an estimated lucrative economic value of $100 million per year. Non-compliance with regulations is caused by lack of enforcement which could lead to significantly reduced fish stock and increased costs for international fish trade. The problem can be solved by strengthening surveillance systems that will monitor illegal activity and enforce measures on illegal vessels entering the lake while protecting surrounding communities from potential health risks

Illegal, unreported and unregulated (IUU) fishing is the most commonly used term to describe the overfishing of fish stocks in Lake Victoria. Lake Victoria is one of the largest freshwater lakes in the world located on the border between Kenya and Tanzania. Half of all commercially important fish stocks in Africa are found in Lake Victoria, which makes it an important resource for both countries. Fish populations have been declining across Africa since 1990s, due to overfishing. The problem was exacerbated by government corruption that allowed illegal fishing activities to continue unchecked. Illegal fishing is a menace to Lake Victoria. It has been reported that as much as 51% of the total fish catch in the lake every year is from illegal fishing. The counties of Kenya, Tanzania and Uganda are heavily dependent on Lake Victoria for their food security and livelihoods. Moreover, these countries have no other significant water bodies to depend on.

The practice of IUU fishing is not only harmful for the people who live near or depend on Lake Victoria but also for our planet which has the busiest freshwater fishery in the world. It is estimated that IUU fishing activities account for 20% of all global marine fisheries catches and 4% of total agricultural catches (FAO, 2014). The sheer volume of such activities makes it hard to monitor and regulate them effectively. Illegal fishing is a huge problem for the Lake Victoria ecosystem. It's estimated that around 2 million metric tons of fish are caught illegally every year (Amarh, 2019; Amri, 2016). This is a big issue as it depletes the fish stocks and as such will lead to higher prices, unemployment and food insecurity in the region. Illegal fishing also destroys marine life and their habitats as well as killing many innocent people involved in this industry. Illegal, Unreported and Unregulated fishing in Lake Victoria is a widespread phenomenon with diverse economic, social and environmental impacts.

The IUU fishing industry as a whole is worth an estimated US$10 billion per year. Illegal fishing has been found to be most prevalent in the east African region of Lake Victoria with Uganda, Kenya, Tanzania and Rwanda being the most affected countries. IUU fishing is a large contributor to food insecurity as it directly affects livelihoods of fishermen. A study was conducted on the effects of illegal fishing by the World Bank reported that illegal harvesting was “associated with lower protein intake among adults and children”. This unregulated fishing also has an adverse effect on fish population levels in the lake, which puts food security at risk in communities that rely on fish as their main source of protein. The fishing industry's motivation to ignore regulations and continue to harvest unsustainable levels of fish from a finite resource is

driven by profits. The IUU fishing industry generates $300 billion in annual value, with the fisheries sector generating $184 billion in global trade value annually.

Lake Victoria is a large lake in Africa. It is the second-largest freshwater lake in the world and is also home to many endangered species (Amri, 2016; Andrew et al., 2019). A recent study found that it has been polluted by IUU fishing practices which have contributed to declining fish populations. The current extent of pollution on Lake Victoria is unknown, but scientists have observed an increase in fishing vessels and reporting on toxic chemicals being dumped into the water by illegal operators. Lake Victoria has been occurring for decades. This is because the absence of any overarching regulations on the trade in fish. It is becoming increasingly difficult to control if fish are being caught from sustainable sources or not.

Smuggling activities around Lake Victoria

The islands of Lake Victoria have been declared a haven of illegal trade activities. The worst affected islands in question include Migingo, Ugingo and Remba. A closer analysis of the situation indicate that lack of policing services is the main cause of this. Absence of security or policing personnel in these islands also contribute to the trade and exchange of illegal goods on the islands (Andrew et al., 2019). In Aluru Island, criminal gangs normally operate in disguise of the legal products being traded. Essentially, this means that the vessels docking transport foodstuff such as rice, cooking oil and sugar. Although, commodities such as clothing, beer, beauty products and fuel are also transported. Due to the secretive nature of the dealings, it is almost impossible to know what goods that are offloaded from these vessels under the cover of darkness.

At the height of sugar shortage in the country, the island was also used as a smuggling hub. Sugar from Tanzania was smuggled into the country through the Aluru Island route and repackaged into bags belonging to Kenyan sugar companies before being distributed. “The sugar would be packaged in 250 grams, 500 grams and one-kilogram packs and then supplied to shopkeepers. Customers who would buy the sugar never realised it was not Kenyan," says a trader involved in the business. Most of the trade especially in sugar and fuel is financed and controlled by well-connected individuals both in Kenya and Uganda (Andrew et al., 2019).

The Ugandan police have also been identified as perpetrators of the corrupt deals especially in Migingo Island. Residents of Migingo Island indicate that apart from patrolling the waters, the police are also involved in escorting boats both to and from the island whenever there is fear of being attacked by pirates. A source indicated that when the Ugandan police went to Migingo Island in 2004, one of their main reasons was to fight smuggling and dealing in contraband goods which had affected Uganda’s economy. Interestingly, the situation has worsened with the officers being some of the major beneficiaries from illegal dealings.

It is also worth to note that growing bang isn’t illegal in Tanzania. With the poor state of policing, much of the harvested bang therefore finds their way in the islands of Lake Victoria. Migingo Beach Management Unit chairman Mr Juma Ombori said the failure to pay tax for goods leaving or entering Kenya is much due to disagreement on who should pay tax to whom (Andrew et al., 2019). “Ugandans say their goods have been taxed in Uganda and since they consider Migingo as part of their country, they say they can’t be taxed twice," he says. This is also the feeling in Kenya where the belief is that the goods have already been taxed in the country.

Smuggling of drugs is the dominant form of illicit activity in the island areas of Remba, Ringiti, and the disputed Migingo Islands. Criminals, illicit traders, and smugglers position themselves remotely on the surrounding coasts, which makes them suitable points of refuge from authorities located on the mainland. Cannabis, heroin, and bhang find their way through other parts of the region via Lake Victoria. Remba, an island referred as an “island of no boundaries,” is known as a safe haven for drug traffickers. It is here that distribution begins, as traffickers import drugs in bulk before further processing and repackaging them for shipment elsewhere.

Piracy activities in Lake Victoria

Piracy activities in Lake Victoria have led to the destruction of the livelihoods of many fishermen. The fishermen are not able to take their boats out for fishing because they are too afraid of being attacked by pirates. Piracy has been a problem in Lake Victoria since the 1990s (Andrew et al., 2019; Anyimadu, 2013). It is believed that piracy in this region has increased because there are no maritime policing forces present to counter armed banditry. The government has tried different approaches to curb piracy but all these have not been successful. Piracy has been a major issue for many years and different stakeholders have been trying to come up with ways to curb it. One way of fighting piracy is through the use of new technologies such as drones and satellite surveillance. However, pirates are adapting and diversifying their activities in response, making it difficult to find a permanent solution.

Piracy activities hinder economic growth but also cause environmental damage to the ecosystem of Lake Victoria because illegal fishing methods such as dynamite, cyanide, or electric shocks are used to catch fish. Piracy activities in Lake Victoria have been increasing in the past few years. This has been attributed to the huge demand for fish from countries like South Sudan, which has been an economic downturn since 2015. Piracy has become a major problem for Lake Victoria (Anyimadu, 2013). The fishing industry has been severely affected by these activities, with many fishermen having lost their lives as well as their livelihoods. Besides this, piracy activities have also created a lot of insecurity in the area, making it hard for fishermen to survive or carry out their trade effectively.

Water piracy is a major issue in Lake Victoria. There is an increasing demand for water due to rapid population growth, but there are also limited available resources. Water piracy has become a profitable business that monopolizes the water market because it is easier for pirates to sell stolen water than it is for legitimate stakeholders to sell theirs. Pirates are able to charge more money because they undercut the market price while avoiding taxes. Furthermore, pirates do not have any opposition from local governments or other stakeholders who would normally try to regulate their activities (Anyimadu, 2013; Attri, 2016). Lake Victoria is the largest freshwater lake in Africa. The population of this vast lake is estimated to be over 100 million people. Many of them live on the shores of the lake and rely on fishing as their main source of livelihood. Unfortunately, these hard-working fishermen are up against pirates who plunder their catches and interfere with fishing equipment.

Pirates use various methods to steal fish from fishermen's nets which include:

a. Hitting other boats or vessels with planks of wood fitted at the end with nails to cut holes in nets
b. Cutting poles connected to net bags by ropes to cut holes in them
c. Pulling out hooks attached to net bags by ropes tied around them
d. Damaging or cutting off parts of nets (mostly near water surface)

Piracy was a significant problem in Lake Victoria region. This is especially true while the region was under colonial rule. The colonial powers profited from the activities while the local people suffered from them. This region has a long history of piracy and this has been a major challenge for the governments in recent years. They have to find ways to minimize it especially when they are looking to develop infrastructure like rail lines through this area.

Challenges in Developing Water Infrastructure

The potential for development of water infrastructure in Kenya's Lake Victoria is limited as a result of various factors. The need for a harmonized and resilient approach towards the development is of utmost importance if the challenges are to be overcome.

Insecurity: The relationship between development and security is always two way. Meaningful development takes place in abundance of a secure environment. Likewise insecurity thrives in undeveloped environment (Attri, 2016). Human and physical security dynamics which are key to development around Lake

Victoria remain a challenge. It is important to heighten the state of security to avoid any threats that may hamper the economic growth.

Population Growth: Population growth along Lake Victoria has increased exponentially in recent years with the rapid urbanization. Urbanization has led to more mechanized farming methods with the use of improved seeds, fertilizers, and pesticides. As population increases, food production is becoming increasingly difficult due to the arid climate. There are now more people then there are resources that can be grown on available land (Attri, 2016; Banlaoi, 2005). The population of Kenya is growing fast which can be linked to high population growth rates among neighboring countries like Uganda and Tanzania. Kenya's population has grown by over 50% since 2000, sharply increasing the demand for food production, water resources and other natural resources around Lake Victoria. Some projections show that by 2060 Kisumu's population could be as high as 10 million people – four times its current size – and Mombasa's population could grow to 3 million people- twice its current size. As such, there is a need to make sure that the communities around Lake Victoria have sufficient access to water supplies as well as sanitation facilities. The lakeside communities should also

Institutional Competition: The lake in its current state is over-regulated/controlled without tangible output to enhance its exploitation. Many institutions have a conflicting mandate on the lake but their outputs have been lagging (Banlaoi, 2005). There is required institutional role mapping to clearly demarcate roles and responsibilities for easier management, coordination, and accountability. This will make the best of existing organizations operating around the lake often with no clear-cut and even often conflicting responsibilities.

Inadequate Legislation and Enforcement: Safety and security in Lake Victoria is crucial for the creation of a favourable investment environment. Improved safety and security should include policing and enforcement of regulations as well as the support of maritime rescue coordination centres, weather alert stations, etc (Banlaoi, 2005). The lack of enforcement bodies in the lake has given rise to recklessness on the part of fishermen and other mariners within the lake. Disregard to the maritime regulations breeds confusion, especially whenever rescue efforts are required. The lake is also a major route for contraband and other counterfeit activities.

Inappropriate Technologies: The existing technologies have always worked well within the operational realm of the lake. The reality is that modern technology needs to be acquired and harnessed to augment the existing platforms. Maintenance of existing equipment and installation of additional modern navigational aids as required in accordance with the SOLAS, along the sailing routes of the reference network is necessary. It is also paramount to establish modern weather and water gauging stations across the lake and especially at key areas with more traffic to foretell weather and disseminate to users of weather information in advance (KMA, 2017).

METHODOLOGY

Creswell (2003) defines a research design as the scheme, outline, or plan that is used to generate answers to research problems. This research work utilized a range of reports and thematic journals to obtain information and data concerning the research topic. Previous research work also came in handy by enabling the researcher to have an overview of the blue economy concept and how to localize it within Kenya's Lake Victoria. The study was carried out in five counties bordering Lake Victoria namely Migori, Kisumu, Homa Bay, Siaya, and Busia. The study examines Kenya`s water infrastructure in Lake Victoria as a key element of harnessing the social and economic benefits of blue economy exploitation. Subsequently, since water infrastructure affects its immediate surroundings, the study area touches on various ports in Uganda and Tanzanian waters.

The study used probability sampling like cluster sampling, which is a form of sampling where groups of individuals were randomly selected from a larger group in order to represent the larger group. The project

assessed the current state of the ecosystem and identified key gaps in knowledge and capacity that need to be addressed to ensure sustainable development of the lake.

The research assistants were trained to administer the questionnaires. They were able to provide feedback on how the study was being carried out and how could be improved. The questionnaire survey is a method of assessing the relationship between certain variables in order to measure their association. Data was then coded and analyzed using the Statistical Package for Social Sciences (SPSS) Software.

FINDINGS

Maritime Defense and Exploitation of Blue Economy Resources

A study on selected agricultural land use issues in the Akua catchment in Lake Nyanza basin was carried out during a meeting with the local communities. The research focused on the functional uses of shallow and deep-sea water in agriculture and their implications for both local and regional food security. The findings suggest that this local traditional fishery system have immense potentials for intensifying the food security of the population and aid to economic development of the community. The study also provided valuable information on mitigating ills such as food insecurity, nutritional depletion, obesity, other ill health issues and hence is an important lake basin threats by adapting fisheries management measures in harmony with long established sea fish resource patterns and with a focus on the conservation of fragile ichthyofauna species. The results of this study indicated that Lake Basin is highly vulnerable and one of the top priorities for developing sustainable coastal fishery, mainly in deep sea for fisheries, can make use of shallow ichthys species as additional sources of food which can serve as a source of food security during poor harvests in the region.

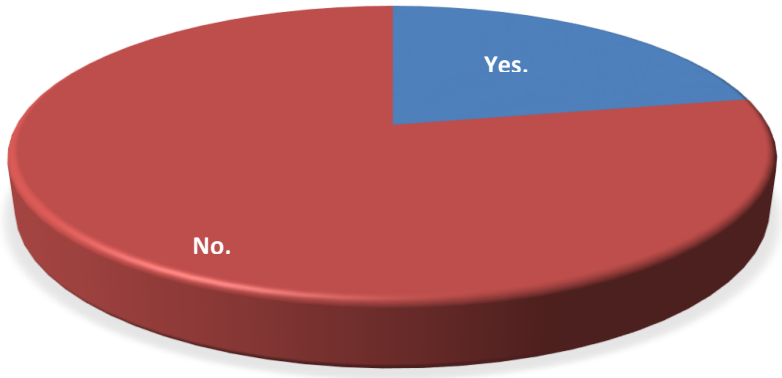

Figure 2. Adequacy of Anti-maritime Terrorism Measures in Promoting Coastal Tourism

The security of the lake is vital to the future of the region, and any minor alteration in the water regime could threaten the whole lake. Therefore, despite there are large challenges, especially for the massive climate change challenges in the basin, the approach by the community through a creative use of the available spatial and landscape information as well as the use of traditional knowledge of the communities can serve an important role in preventing the immediate threats to the ecosystem. Furthermore, in this regard, it is important to note that there are long term concerns and potential threats from illegal fishing and increase in illegal fishing in the lake that must be addressed by the Government, especially in a modern world. The Lake currently hosts over one thousand mainly recreational, but also some industrial and commercial fisheries in the Ganga, Deodar, Musi River and Haldwani. Therefore the development of sustainable fisheries management in the Lake is very important to the whole region, for water security and livelihoods.

Blue economy success of the Lake Victoria region in Kenya is vital and both the local and regional governments should make all necessary efforts to foster the successful development of this sector. This is because the area around Lake Victoria is one of the major sources of water supply to the region and through sustainable development the region can achieve potential food security and reduction in poverty. Anecdotal

evidence suggests that successful blue economy and blue economy sustainable development in the islands of Lake Victoria can drive institutional change in a holistic way that achieves both immediate and long-term benefits. This contributes to energy security, food security, environmental conservation and social justice as well. Considering the holistic concept of development, it is now necessary to revisit all the layers of governance structures to know the mechanisms in which local communities are the vital stakeholders for the whole. The study thus highlights the need for health to be embedded in the curriculum of teachers at all levels, including universities. Teachers at all the levels should be encouraged to discuss and understand the causes and effects of diseases that affect the health of people in the community, thereby highlighting that it is important to encourage teachers to develop the socio-cultural adaptation strategies that can empower them to promote healthy lifestyles and interventions.

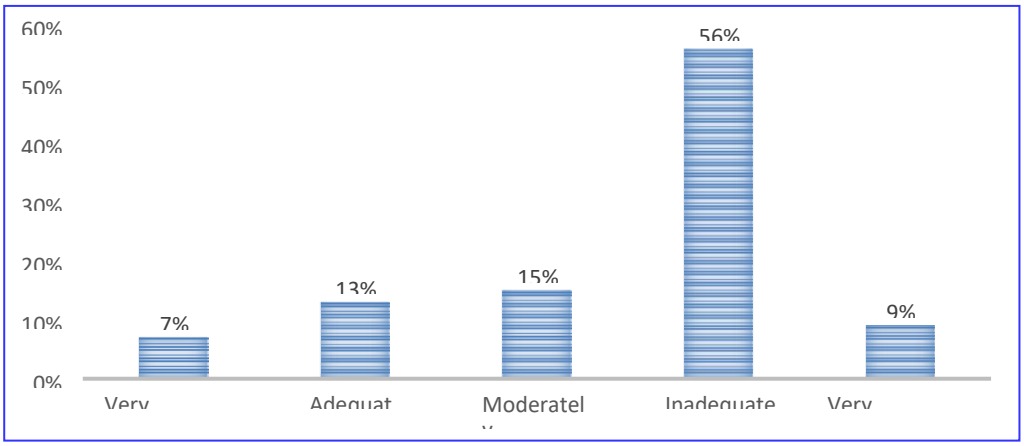

Figure 3. Adequacy of Antipiracy Measures in Enhancing Marine Transportation
Source: Field Data (2020)

Additionally, this study also reveals the need to have a communication gap analysis among the government and the community in order to identify the issues and challenges that are not being addressed and further improve on the existing solutions. Finally, the evaluation of sustainability in blue economy shows how the sustainability has not been measured on a set of indicators that include the ones listed in this study. Additionally, this research shows how sustainability and self-sufficiency are the key elements in order for blue economy to be sustainably successful in Lake Victoria. Therefore, it is necessary to have more evaluation on the sustainability and its effect on the economic, health and environmental sustainability. The evaluation of these aspects and the recommendations from the study can provide clear directions in the next step that can help communities to be economically, socially and ecologically sustainable.

Lake Victoria Basin Security and Exploitation of Blue Economy Resources

Blue Economy and World Heritage areas are being exploited, and people of all economic and racial groups and nationalities are threatened. Insecurity and poverty are also key reasons behind this situation. The people are reliant on water and energy to run their farms, businesses, and organizations. In a number of cases the countries concerned were either responsible for damming rivers, or lost the rights to their forests. They are directly or indirectly giving concessions to foreign investors with low environmental and human rights standards. In Kenya, government policies, privatization, and expansion of mining and coal seam gas operations have resulted in displacement and land degradation. The Blue Economy initiative is a globally supported movement and initiative, whose vision is to shift the world economy from material and fossil fuels to renewable and sustainable sources of energy. This transformation will bring significant reductions in emissions, economic growth and poverty alleviation. The geography of Kenya is attractive to blue economy sectors. The capital Nairobi and Lake Victoria basin has a wide selection of energy potentials and is an ideal

setting for any blue economy sector. The geospatial approach to understanding and managing Kenya basin, has been made available to policy makers and decision makers. This has allowed us to answer key questions about key stakeholders, exploit, and security. The project focused on identifying human rights and poverty related issues, as well as involving policy makers, local people, and other stakeholders to improve livelihoods and support sustainable development.

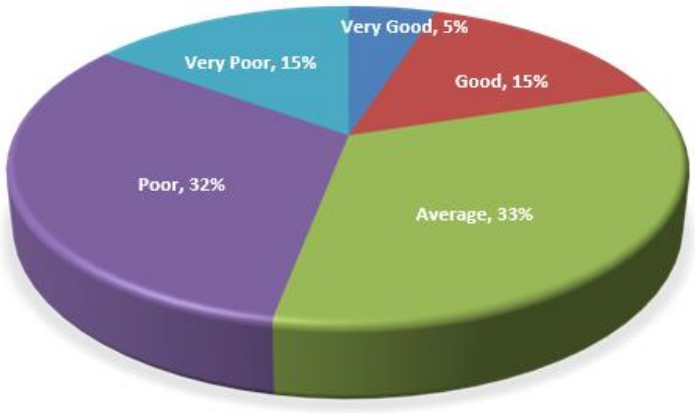

Figure 3: Rate Government's Performance Regarding Lake Victoria Basin Governance Source: Field Data (2020)

Stakeholder interaction, stakeholder participation, and stakeholder engagement are key components of participatory development processes. However, traditional models of economic development have been designed without including stakeholders, and researchers have argued that most traditional models have inadequately incorporated participatory approaches to design or implementation. This is despite increasing calls to explore and extend the roles of stakeholders in development. Thus, previous literature on stakeholder analysis has largely concentrated on the challenge of incorporating and engaging with citizens in the development process, and of bringing citizens into the design and implementation of development projects.

The diversity of organizations, activities and decision-making bodies within and across the Kenya basin warrants new tools to identify and understand the different stakeholders and how they interact. Some of the challenges faced in engaging stakeholders in energy transformation is the difficulties in identifying and exploring diverse stakeholders for engagement and integration, and in coordinating multiple decision makers who make critical decisions. By combining secondary and primary data sources with quantitative and qualitative research methods, we provide a deep analysis of the social and economic consequences and pathways to the determinants of energy and oil products markets, products, and production in the region. No better way exists to understand the dynamics of the complex interactions of stakeholders to derive actionable insights for development planning and policy formulation.

Security in the lake basin in Kenya is important as such understanding of policy drivers, barriers, and enablers for energy sector policy in Kenya can assist the district governments to adopt energy policies that enhance resource efficiency and maximize economic growth. To evaluate whether the security and livelihoods impacts of the interventions were better for the community, the study was designed to assess the impact of interventions on food security, food prices, health, livelihoods and food insecurity as indicators to capture the impacts of interventions and strengthen the causal claims of the case study. Although security in the study area was controlled by national and district level actors, food security as an outcome for the impact evaluation was measured based on cross walks between the regional and national security variables with qualitative information on food insecurity from the village level data collected. This method has been used elsewhere as a quantitative approach to understanding food insecurity in the Lake Basin but also to understand food

insecurity at the national level by using qualitative data in this study as a way to address policy gaps and strengthen causal inference from survey data.

Previous and ongoing research on security and PDSs for the study location has shown that the transmission of commodities through food security mechanisms is not a linear process, but instead consists of more complex interactions and cycles between food production and consumption, food trade and trade balances, and the importation of agricultural goods and the export of commodities. A separate study presented in this paper explored some of the issues of trade and security in Lake Victoria on the PDS side and found that the linkages between PDS activities and food security is complex and in need of strengthening. Some of the research findings on trade and food was shared by the research team for the case development and was used in the survey design for the assessment.

The assessment included assessments of the impact on food and income security in each of the districts in the Lakes Basin. In the assessment, the district health and food systems are the input and output of the model and they are directly linked to security. Their linkages with security are through both the livelihoods and income generated and the food that is produced and used, both directly and indirectly. The assessment was designed to answer the question of the type of food security variables, if and how food and food insecurity are linked to the food and health systems and food distribution in the area and the assessment approach was to compare the differences in food and socioeconomic variables of respondents in each district, the link between security and food and financial security is assessed. The analysis was undertaken for each of Lake Victoria's districts and assessed and showed that there are differences in the respondents in the assessment and these were between districts in such matters as type of job, religion, residence, migration to Lake Victoria.

Lake Victoria Governance and Exploitation of Blue Economy Resources

Kenya security situation in Kenya threatens the stability of the entire economy of the country. Therefore, Kenya is highly vulnerable to unstable security. The chapter provides insights to analyze the relationship between security situation and sustainability of economic activities. Furthermore, the relationship was analyzed in a seasonal view to determine the economic and social conditions in Kenya and how seasonal conditions impact sustainability of the economy in the long term. Based on the analysis, it is concluded that there is a link between security challenges and the long-term sustainability of financial activities in the country.

This link can provide policy intervention at the same time as enhancing and protecting human rights in the growing economy in Kenya. The various challenges that the country faces in terms of security can help understand and plan for key areas of improvement at a strategic level, which in turn can provide stability for the entire Kenyan economy and stability for agriculture in Kenya, among other sectors. The country has thus prioritized in strengthening security, social inclusion, and fostering trust between citizens and the government. With the strong commitment of the government to the security challenges, it has set in place plans to develop effective policies to address challenges associated with insecurity.

These plans include achieving a consensus for justice and empowerment among Kenyans; strengthening national military and security sector capabilities to address the ongoing insecurity; and improving the national infrastructure to ease traffic congestion and facilitate security operations. Similarly, effective food security policies should be put in place.

Furthermore, there should be increased efforts to solve the security problems through various aspects of democratic governance. Through the adoption of effective policies and implementation of laws that promote human security, the food insecurity problem could be addressed and prevented from entering a cycle of recurring conflict. There are various challenges faced in the agricultural sector in Kenya that has become evident over the past several years. These challenges are a crucial part of the country's economic development

and national security. Though agriculture contributes substantially to the country of Kenya's economy, there are various factors that impact negatively on agricultural productivity. These include abject poverty, unreliable supply of basic food items, poor environmental conditions, poor health and quality of schools, inadequate institutional structures, minimal food security, inadequate agricultural extension services, poor policy implementation, poor research, and poor public awareness and knowledge among the farmers.

Kenya has undergone economic recession in the wake of the oil crisis of the mid to mid to latter half of the decade. This has placed the economy under significant pressure, and despite several steps taken by the country towards recovery, in the years since the oil embargo, it has seen significant declining performance in its Gross Domestic Product and average growth rates in manufacturing, business investment, and exports. Secondly, there is continued tension and conflict over land. High rates of unemployment, bad governance, unstable socio cultural conditions and education along with a growing threat of environmental degradation and unrest over the land has all contributed to a decline in economic activity in the country.

According of the Kenya National Bureau of Statistics, average income in Kenya has declined by about one per cent in the last decade. The growth in the economy in the period was about one percent which is a major reason for the growth in income. The decline in the growth rate may be attributed to foreign borrowing, poor capacity to cope with debt, and the government's inability to control the inflation. Other factors include decline in agricultural exports, volatility of currency, expiry of green revolution initiatives, and drop in global prices of exportable commodities. In case of the land tenure situation there is an issue between the ruling party and the opposition parties regarding the land which remains as a point of conflict.

Discussions

Maritime Defense and Exploitation of Blue Economy Resources

Influence of maritime security on exploitation of blue economy resources along Lake Victoria Basin is a world center of biodiversity, biogeochemical cycling, eco-environment, and a region of opportunities for African economy development (Banlaoi, 2005). After decades of political instability, shifting status of market economy, climate changes and environmental deterioration, regional authorities must rapidly revise the national park system so as to protect the ecosystems, unique in the area and international peace and security. Moreover, since most of the blue economy activities have a key element of sustainability, all measures needed for sustainable livelihood generation, and climate change mitigation should be encouraged to reduce pressure on natural ecosystems and environment degradation.

In order to recognize the significance of ecological zones for the livelihood of local population and the possible interrelations between the human development and ecological sustainability of Blue Economy, this study provides a quantitative assessment of the dependence of livelihoods and natural environments with the Blue Economy ecosystem and conservation values. The dependent nature of blue economic systems on the ecosystems from which they profit, has been the subject of an increasing number of researches. It has recognized the importance of studying the livelihoods dependence on ecosystems, and the actual dependence and influence of environment on the livelihood activities of people. However, most of such studies have been undertaken through a specific approach which does not allow the interlinkages between the elements of livelihood dependence and the ecosystems.

The relevance of the dependencies of livelihood and security of the basin on the physical and social bases of the ecosystems has not yet been investigated. Through a comparative study of the livelihood systems and their dependence on the natural environments, the dependence and extent of livelihood on ecosystems have been investigated in the case of Lake Victoria (Banlaoi, 2005; Barros & Hespen, 2013). The investigation on the evaluation of the dependency of livelihood systems on ecosystems and the conservation value of the environment through socioeconomic analysis and socioecological analysis has been carried out for the Lake Victoria region in Tanzania. It is shown that socioecological analysis has some important

limitations when it is used as an analytical approach. Most important limitations are the high cost and low productivity of data collection, analysis and interpretation. The results of this research have important implications for all the economic activities, in particular those which have their basis in the livelihood system of the community.

However, some of the socioecological approaches, mainly the large data sampling and contextual analysis, offer possibilities for identifying more generalized patterns of dependency of the development of the key indicators on the specific types of ecosystems. Understanding the system of development of ecosystem will not be possible unless the differences between security and ecosystem ecology are studied, however, the differences are far wider than the similarities (Barros & Hespen, 2013). The findings of the study indicate that the sources of energy for the hydropower facilities were the main source of income of the inhabitants, however community, government and international institutions were also important for the economy. The hydropower production has not caused any harmful effects on the ecosystem and does not affect the development in the ecosystem. Ecosystems in Tanzania used for the production of biofuels were found to be of better quality than the majority of the protected areas. The study has showed that some objectives should be to incorporate these systems into the national development planning.

Lake Victoria Basin Security and Exploitation of Blue Economy Resources

The East African Blue Economy Initiative aims to address the problem of declining fisheries and fisheries products (Barros & Hespen, 2013; Brück et al., 2008). The project intends to double the number of fish harvested by increasing production by ensuring a stable price and improving the access to fishing harvests. By establishing such a new and different kind of fishing industry, a new fish market, new sources of fish and protein, creating new aquaculture facilities and protecting natural habitat, this initiative will lead to a reduction in the dependency on imported fish and encourage local supply of fish at a lower cost.

Assessment of the EABE has considered and analyzed the economic, social and political implications of the overall project and has aimed at providing guidance for assessing and approving the implementation of the initiative. In this section, the policy and legal implications have been discussed and the challenges faced and explored. The main objectives of this assessment are as follows; to provide a common framework for analyzing the market, socio economic, political, environmental and social consequences of the implementation and approval of the blue economy initiative in the framework of the Blue Economy framework; to highlight the challenges which have been faced by the local and international stakeholders and the solutions adopted for the resolution of the problems that have been identified in the implementation; to identify policy recommendations to ensure the successful implementation of this initiative; to discuss and identify factors contributing to achieving the objectives of the initiatives at various levels; to examine the contribution of this program to the development of specific social, cultural and physical assets and the economic development of the areas in which the initiative is implemented; and to identify specific management, ethical, social, and environmental policies that could be applied at all stages of the processes, in order to make them more productive.

Security plays a pivotal role in the development and successful implementation of Blue Economy in the Lake Basin in Kenya and East Africa. The Lake Basin has become increasingly prone to hazards and dangers arising from the natural hazard of floods, the terrorist attacks and other man-made hazards. Security is not an optional element in this region and in most cases is mandated by law (Brück et al., 2008). This is due to the fact that these lakes are politically, militarily and culturally sensitive areas, they are the harbors of migration and way stations for displaced peoples and they are almost surrounded by ungoverned borders. The security of the Lake basin therefore is of strategic importance for the country. However, the defense sector of Kenya and its nationalization would not have the desired effect if it is not grounded in the principles of good governance, human rights, gender equality and inclusiveness. In order to ensure safety, peace and harmony at the grassroots level, there must be an effective mechanism to make relevant governance structures accountable

to the people at the community level. This will be beneficial to people in their efforts to build up the ecosystem of blue economy for sustainable livelihoods and resilience. This presents a challenge to effective, efficient and sustainable defense in Kenya. By employing the AGLF model of control over defense, integration of the most democratic bodies into the national security management structures will enable effective defense management and rapid growth of the security nest.

With regards to Kenya, Blue Economy can only be attained if the communities around the Lake support security agencies in achieving Blue Economy in their own communities and country. Most security agencies are losing steam on achieving their objectives due to frequent attacks on their personnel. Security establishments are funded by citizens, who need to support the existing infrastructure and survive with minimal expenses in case of a conflict. The community at large also suffers from poor roads, poor infrastructure and poor use of technologies and financial services as well (Brume-Eruagbere, 2017). The issue at hand is to transform the status quo so that the state not only begins to take the role of providing infrastructure and amenities but also supports and assists the private sector for the benefit of citizens and at minimal expenses and ownership. One cannot achieve the vision of Blue Economy unless the community at a large level and private sector contributes their endowments, which will help secure the security of citizens.

One of the objectives of the plan is to stimulate economic growth and development in Kenya by creating business opportunities and providing basic needs in economic services to citizens. Given that the economy of Kenya is already high, the growth rate cannot be promoted without infrastructural development and investments in infrastructure. There is also a need for interagency partnerships to be promoted and sustained. There is a need to encourage large investment from the private sectors, which in turn requires a high degree of government involvement. Furthermore, since information technology will be at the forefront of economic development, this could play an important role in achieving the vision for Blue Economy, by encouraging and supporting business and investments for technology related infrastructure and job creation.

Lake Victoria Basin Governance and Transformation of Blue Economy

The Basin, recognized as one of the world's best and most natural resource rich hydro system, including fisheries, scientific lakes, cultural heritage and an economic powerhouse, was undergoing transformation from its traditional economy into a blue economy. To better understand the factors behind the Green Revolution and set the terms for future integration, an overarching needs analysis was commissioned to inform governance and strategic direction for basin management (Brume-Eruagbere, 2017). The new National Strategic Vision and National Goals were developed with the participation of stakeholders to achieve better livelihoods in the basin and to drive development initiatives.

The basin management capacity development initiative has now been underway for a number of years and has the coherence of the planning for deep water and fisheries management which forms the backbone of the Kenya's blue economy blueprint. Developing a more coherent approach to governance of basin management, strengthened communication with stakeholders to ensure the vision and the general strategy for the basin is clear, the measures to achieve the vision are realistic and progressive, and the measures are feasible. The strategy was adapted to a basin constitution incorporating the vision of sustainable exploitation and of a sustainable livelihood where sustainable development is the yardstick to measure success. The vision and strategic objectives are linked to the key measures of governance, risk and stakeholder involvement. The national basin governance framework was further restructured to make good governance more a core of the governance for the Blue Economy strategy.

These structural changes to create a harmonized, coordinated and accountable framework for governance were the focus of the summit. The summit had achieved in small bites, the convergence of the visions for the Land Rights Council, blue economy and governance. As a result of the series of in-depth discussions, a comprehensive national land rights framework for in Kenya has been agreed upon and is

expected to be implemented in phases. The Constitutional Commission will draft a framework and guidelines for land administration and private sector utilization of Kenya's land and water resource through the Blue Economic Initiative. The guidelines are expected to form the basis of the blue economy strategy and will be implemented by the government.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the establishment, expansion and development of Blue Economy of Lake Victoria basin should be guided by security measures and economic capacity building measures. The economies should be strengthened to serve the interests of the nation's rather than their own interest. Therefore, Blue Economy is very important for the developing world as well as the developed world. Tanzania and Uganda are examples of the countries who have been developed due to their ability to move towards Blue Economy. Moreover, Blue Economy will help prevent famines and sharp reductions in food supply and therefore hunger, which is not conducive to development. The benefit of Green Economy will also be possible to enhance the growth, development and development ability of Lake and river basin countries. To sum up, the Blue Economy of East Africa will be an added value to the World Development. However, in order to fully create a Blue Economy, the factors contributing to agriculture, fisheries, tourism and culture must be properly addressed.

As with what has been done in Kenya, the government is gearing up to make the nation a blue economy by accelerating manufacturing, encouraging investment in technology and infrastructure, making the southern part of the nation an attractive tourist destination and promoting decentralization of power. The tourism sector of the economy represents Kenya in the international community; the Government has decided to use the tourism sector as a way to promote the growth and development of the country as a whole. This means that it is necessary to ensure that development in the tourism is sustainable. The government has, therefore, launched tourism initiatives, such as tourism industries policy, to make sure that there is proper support to these initiatives, thereby contributing towards building the industry. This will help create an attractive tourism industry in the country and help make it a Blue Sector to the world. In order to develop the tourism industry, the Government is also implementing a multi country tourism program to promote tourism to encourage people to travel to Kenya and other parts of the region.

The appropriate strategies and approaches that would be required to sustainably manage tourism, including improvement in infrastructure and facilities, reducing corruption, and ensuring tourism safety and security would be necessary, in addition to providing appropriate regulation and guidelines. The Kenya Tourism board is made up of a number of tourism officials, representing a range of stakeholder communities such as the hoteliers, the travel industry, business owners, and government officials. In the tourism industries of Kenya, regulations and guidelines have mainly been guided by the %-star hotels and businesses, but in the tourist industry, Kenya has undertaken new projects and programs to promote safety. It is the global markets and the international tourism bureau that made Kenya famous and visited every decade. The region, Kenya is rich in natural beauty and wildlife which cannot be replaced.

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