



**A REVIEW OF LAKE VICTORIA SARDINE PRODUCTS BUSINESS AND INSTITUTIONAL ARRANGEMENTS FOR DOMESTIC AND REGIONAL TRADE**

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**ABSTRACT**

*Effective and efficient business and institutional arrangements are essential for every industry to position the business ventures within the value chain, show how transactions are made among stakeholders and underlying economic logic for value creation. This review focused on the existing business and established support institutional arrangements for sardines (*Rastrineobola argentea*) from Lake Victoria in order to assess their influence on domestic and regional trade. The review established that the business arrangements between the crew members and boat owners in Tanzania influences revenue sharing among players; this was connected to poor performance of crew members, theft of fishing equipment, boat engines and portion of fish products by crew members. Sardines traders had not been able to access the lucrative outlets due to weak institutional support and lack of economies of scale. At the national and regional levels, the authors focused on the co-management of fishery resources through the Beach Management Units, national fishery policies, strategies and support institutional arrangements. At national level, the main limitation identified was poor performance of the Local Government Authorities in the aspects of surveillance, control, fisheries law enforcement as well as close monitoring and inspection of fishing activities which led to depletion of the fishery resources and influenced trade performance. Furthermore, it was observed that at regional level, there was weak formal link between the Lake Victoria Basin Commission (LVBC) and Lake Victoria Fisheries Organization (LVFO) and this jeopardised the effective and efficiency management of fishery resources and efforts towards poverty alleviation.*

**Key words:** Boat owners, Fishers, Processors, Sardines, Traders,

## INTRODUCTION

Fishing is a major economic activity for Lake Victoria basin communities, providing employment, nutrition and contributing greatly to the national economies of the three East African states (Kenya, Tanzania, and Uganda) (Lwenya and Yongo, 2012). It has been pointed out by Njiru *et al.* (2008) that fisheries produce an annual income of \$US 600 million, providing employment opportunities for over 3 million people within the basin. The frame survey report of 2014 shows the increase of 2.3% of fishers in the Lake Victoria when comparing with the 2012 frame survey report; the current number of fishers on the Tanzania side is about 103,540 (URT, 2015, URT, 2016). Assuming that each fisherman supports three people in secondary employment (Reynolds *et al.*, 1995), then over 300,000 people are directly employed by the fishery on the Tanzania side of the Lake. Sardines (*Rastrineobola argentea*), the silver cyprinid is known by various local names such as “*daga*” in Tanzania, “*mukene*” in Uganda and “*omena*” in Kenya (Moenieba, 2016), generates an average monthly income over \$150 to individual fisher/trader, provide employment and bring in substantial foreign exchange, estimated at over \$2 million annually (Luomba and Onyango, 2012). Therefore, sardines are the most important fish resource in Lake Victoria and its biomass is estimated at over 1.3 million tons. The rapid growth and lifecycle of sardines allow their exploitation at an annual level of 70% (Damien and Luomba, 2011, Moenieba, 2016). The species is one of the three major commercial fish species in Lake Victoria and leads with 71.2% in the catches. Its contribution to the beach value was Tanzanian shillings (TZS) 26,947,408,000 (USD 12,536,000) equivalent to 40.4% of total value in 2014 (URT, 2015). According to LVFO (2016), Tanzania is the largest producer of sardines with volumes of 289,873 tonnes in 2010 and risen to 433,845 tonnes in 2015; the value of production increased from US\$66.8 million in 2010 to US\$227.7 million in 2015.

Despite the fact that the fisheries of Lake Victoria play a crucial role in the livelihood of many people, the resources are under pressure from the increasing human population around the Lake, most of whom are poverty-stricken and lack of alternative livelihoods (Lwenya *et al.*, 2009). Furthermore, with the decline of Nile perch stock, urbanisation and rising price of other protein sources such as meat, the demand for sardine has expanded considerably, with new markets in the Far East such as Malaysia and Cambodia importing from Kirumba market in Mwanza city, Tanzania (Damien and Luomba, 2011). Despite the increase demand of sardine products, the livelihoods of actors along the value chain is not promising. Omwega *et al.* (2006) argued that fishers in Lake Victoria are regarded as poorest group of people in all sectors of the economy; considering the way they live, assets owned, saving habits; poor dressed as well as living in poor housing structures. Therefore, there is a need to review the existing business arrangements and the support institutional arrangements prevailing in the Lake Victoria sardines industry. This presupposes a challenge of inefficient production, processing and marketing of sardines in the domestic and regional markets and hence, low contributions to the beach value and incomes of the people involved in the sector. Investigation of the existing business arrangement, specifically, value creation, delivery and capture and the relationship between stakeholders and the supporting institutions will inform the decision makers and stakeholders along the sardines’ value chain to position strategically for improving the production, processing and distributions of sardine products.

Freeman (1984) defines a stakeholder as any group or individual who can affect or is affected by the achievement of the organization’s objectives. Freeman (1984) and Freeman *et al.* (2010) argued that the stakeholder theory was developed over the past thirty years to solve the problem of value creation and trade. Freeman *et al.* (2010) suggested

that stakeholder theory solves the value creation question by asking how we could redefine, redescribe, or reinterpret stakeholder interests in order to create more value. Freeman *et al.* (2010) pointed out that stakeholder theory is fundamentally a theory about how business works at its best. Parmar *et al.* (2010), Freeman *et al.* (2010), Hult *et al.* (2011) and Kull *et al.* (2016) reported that stakeholder theory has become a prominent theory in business research as it has emerged as a narrative to understand and remedy interconnected business problems related to how value is created and traded. The marketing research has mainly focused on single stakeholder relationships, the idea of multiple stakeholder relationships to achieve industry maximum performance has been evolving slowly over the past decade (Hult *et al.*, 2011). The same authors argued that the stakeholder theory provides a valuable framework for examining how different stakeholders affect or are affected by marketing efforts. This review is anchored on the stakeholder theory to explore the existing business arrangements between primary stakeholders (fishers, boat owners, processors and traders) and the secondary stakeholders (existing national and regional fishery industry support institutions) and its implications to sardine trade.

This paper reviewed the existing Lake Victoria sardine products trade in order to establish existing and potential business arrangements among fishers, boat owners, processors and traders and factors that would affect the economic share along the value chain stakeholders. In addition, the review explored the national and regional institutional arrangements and their implications to trade of sardine products. The motive behind this review inclined on the fact that the existing business arrangements determine the quantity and quality of the final sardine products and incomes of stakeholders along the value chain. Thus, in order to achieve the broader goal of increasing the incomes of communities involved in the sardine industry and thereby improving their

livelihood, the existing business arrangements need to be investigated so as to identify strengths, weaknesses, opportunities and threats for efficient and effective exploitation of the Lake Victoria sardines. The sardine trade in Lake Victoria involves a wide range of actors including fishers, processors, boat and equipment owners, traders, transporters to mention a few; however, this study reviewed specifically the business arrangements between sardine fishers and boat owners and their effect on trade; the sardines' business arrangements between processors, traders and their effect on trade as well as the fishery industry national and regional support institutional arrangements and their implications to trade. Specifically, the review addressed the following specific objectives:

- To review the existing business arrangements between the sardine fishers and boat owners;
- To assess the influence of the existing business arrangements between fishers and boat owners on sardine trade;
- To review the existing business arrangement between sardine processors and traders;
- To assess the influence of existing business arrangements between processors and traders on sardine trade;
- To review the existing national fishery industry support institution arrangements
- To assess the implications of existing national fishery industry support institutions arrangements on sardine trade;
- To review the existing regional fishery industry support institutions arrangements;
- To assess the implications of existing regional fishery industry support institution arrangements on sardine trade.

## **METHODOLOGY**

Content analysis was employed in this review. According to Elo and Kyngäs (2008) content denotes what is contained and content analysis is the analysis

of what is contained in a message. This review was mainly providing knowledge, new insights and making valid inferences based on the previous studies which had been conducted in the Lake Victoria fishery industry with regard to the existing working relationship between stakeholders and the established institutions at national and regional levels. The stakeholder theory was employed in this review because the review was focusing on primary sardines' production and distribution stakeholders and the secondary stakeholders mainly the existing fishery industry support institutions. The theory gave an overview of value creation and trade. In this case, the value was created and delivered by primary stakeholders (fishers, boat owners, processors and traders) and the primary stakeholder needed support from the supporting institutions to deliver the products efficiently and hence improve the domestic and regional trade. In this case, the established fishery industry supported institutions were termed as secondary stakeholders in the sardine trade.

The present work was based on the desk review of literature from peer-reviewed journals, other publications and reports. The review focused on three aspects: first, the existing working relationships between boat owners and fishers and their influence on production and trade. Second, the business arrangements between the processors and traders and its influences on domestic and regional trade. Finally, the existing national and regional fishery industry support institution arrangements and their implication on trade at the national and the regional trade.

### **Business and Institutional Arrangements**

For the purpose of this review, business arrangement refers to the working relationship between stakeholders involved in the value creation (sardines fishing and processing), value delivery (transport and distribution) and value capture (revenue distributions among the stakeholders). The fishery industry

involves fishers, boat owners and processors who are mainly in the production part (value creation), traders (value delivery) and finally, all these groups receive revenue due to sell of the product (value capture). The effect of such business arrangement among stakeholders to trade refers on how such working relationships affect sardine production and trade in general. This was looked upon within the context of national and regional levels trade. Secondly, the institutional arrangements were the national and regional support institutions established in the Lake Victory fishery industry. The support institutions included national, regional, governmental and inter-governmental institutions, policies and regulations that support the Lake Victory fishery industry, specifically on production and trade of sardines. The implication of such supporting institutions, policies and regulations was reviewed focusing on how these institutions promoted sustainable resource use and trade at national and regional levels.

### **Major Actors**

#### ***Fishers***

Fishers were usually migrant young men with a rural background who came to the Lake with little finance at their disposal and were hired to work on the fishing boats. Their tasks include setting the nets at a suitable spot and waiting for fish, and then sail their catch back home (Beuving, 2013). Fishers are mostly adult men who go into the Lake to capture fish. Sardines fishers had some experiences or knowledge on the seasonality of the fishery, actual harvesting of the fish and fishing methods as well as the endemic nature of the fish and the setting of the fishing gears, suitable fishing spots, lamps and hauling (LVFO, 2015, Damien and Luomba, 2011). Fishermen leave the beach in the dark of the night; they use pressure lamps to attract sardines and work all night long hauling up the sardines which have been caught by the nets (Jansen *et al.*, 1999,). Gordon and Ssebisubi (2015) reported that the casting and hauling of sardine nets is done in every 30 minutes.



### **Boat Owners**

Boat owners or “tajiri” as known in Swahili by the locals are those who own few boats and operate on what is known as the expenditure share system and such owners have little investment capital and few laborers. Dried sardines for each individual boat is sold to traders at the beach level (Merdard, 2012). Boat owners are usually medium to high income earners who may have previously been civil servants, business entrepreneurs or fishers who had enough capital for large-scale investments (Massette, 2013). Boat owners provide the investment and maintenance of the fishing units, taking risks involved and normally await the return of their boat(s) on the beach, oversee catch sales and payment of crew as well and provide necessary inputs such as fuel, nets or boat repair (Odongkara *et al.*, 2005).

### **Processors**

Processors are principally women and young men (Massette, 2013). Processed fish is handled by female fish processors who employ deep-frying, sun-drying and smoking techniques before selling to traders (Burnley *et al.*, 2014). Fröcklin *et al.* (2013) reported that women have important role in capture fisheries. The processing of sardines is mostly a reserve for women at many landing sites, although there are also some men who are involved (URT, 2016). Most of these women were displaced from the Nile perch processing activities after the establishment of processing industries. The processing sector is highly dominated by women (Samey, 2015).

### **Traders**

Commonly, the traders buy sun-dried sardines from either boat owners or processors and in some occasions, they buy sardines from boat owners before it is fished from the water and, employ both the fishers and processors to fish and dry the sardines (Massette, 2013). These wholesale traders mostly buy sardines from small scale processors and traders who

have collected the fish from the fishers at landing sites (URT, 2016). However, few traders collect fish themselves from boat owners (Damien and Luomba, 2011).

## **RESULTS AND DISCUSSION**

### ***Existing Business Arrangement Between Fishers and Boat Owners***

Jentoft *et al.* (2010) argued that the notion of open access has not transpired into a functioning freedom because the capital outlay capability required to fish is indeed huge and in order to fish, a fisher needs a boat and fishing gears, costing anywhere between US\$800 and US\$1500. There was diminished access among small-scale fishers due to investments in such modern technologies as outboard motors, a lot of fishing equipment and hired fishers to undertake the fishing (Lokina, 2014). People who could not afford the investment in boats and fishing gear could still become fishers on larger boats that operate offshore and owners of these vessels provide crew members with only the most basic needs such as shelter and food (Jentoft *et al.*, 2010). The majority of actors in the fisheries industry today make a living as fishermen; however, since boats and equipment were expensive, and loans for business development were difficult to obtain. It was therefore, not uncommon that the small minority of fishermen who succeeded in moving up quickly in the fishery business were those with easy access to external financial sources (Beuving, 2010). Eggert *et al.* (2015), Eggert and Lokina (2010) and Lokina (2014) argued that total fishers ranges from two to six persons and the owners of the boats are commonly involved in beach activities, e.g. selling the catch, and in some cases, are on-board their vessel as captains or ordinary crew.

There was quite a big gap between the owning and the labouring classes within the fishery industry and fishermen who did not own shares in boats or gears do most of the actual fishing (Lokina, 2014). Lokina (2014) pointed out that there are various kinds of remuneration systems used in the Lake Victoria

fisheries, which were divided into four major categories. First, is the share system with fixed amount and which means that whatever is realized is divided among the fishermen and the owner before deducting the daily running costs. Secondly, is the different share system in percentage; in this case, the daily proceedings are shared in percentage after deducting cost and this can be 60:40 or 70:30 or 50:30:20 for owner, fishers and boat respectively, depending on the agreements between the owner and the fishers. The first and second sharing systems were regarded by many as more exploitative than the other two forms outlined below and, the most striking difference between the two systems was that, fishers who receive their share of revenues after running costs were deducted face the risk of receiving no income at all (Lokina, 2008). The third form was equal share after deducting running cost and this can be 50:50. The fourth system was the ratio in days, in this case they can count say five days of operation, and the ratio can go like 2:2:1 or 3:2:1 or 3:1:1, that's owners' day, then fisher day, and boat day (Lokina, 2014).

Lokina (2008) argued that the share arrangements provide different incentives to the skippers and are therefore, expected to influence the productivity of the crews. The same author pointed out that the most striking difference between the two systems is that fishers who receive their share of revenues after running costs are deducted risk receiving no income at all and in addition to the variation in sharing mechanisms, some fishers receive an extra bonus, which is unknown in size. The variation in the sharing of revenues has been pointed out by most scholars as a source of technical inefficiency of the fishers in the fishery industry and this possessed challenges to production in general and theft of fishing gears, specifically.

#### ***The influence of Business Arrangements between Fishers and Boat Owner on Sardine Trade***

Harris *et al.* (1995) reported that strikes among the fishers are not uncommon, a clear indication that the

people who carry out the work in the Lake were not satisfied with their share of the earnings. The fishers had, however, a strong sanction against being offered too little; they can steal both gears and fish (Jansen, 1997).

Based on the above arguments regarding the business relationships and the sharing of revenue of boat owners and fishers, there is a clear indication that the arrangements have influence on sardine production and trade at national and regional level. Lokina (2009), found that artisanal fishers were relatively technically efficient and that skippers' skills did play a role in the efficiency of the boat. The author, further reported that for the sardines, efficiency increased with skippers' experience, education as well as ownership of vessels and the revenue shared after cost deduction. The efficiency increased for both Nile perch and sardines if the owner shares 50-50 with the crew and if the skipper enjoys extra bonus (Lokina, 2008). It was clearly apparent that the current business arrangements between the boat owners and crew members had negative impact on the production, trade and the revenue accrued. Odongkara *et al.* (2005) said that the high disparities in the distribution of benefits creates a sense of injustice among beneficiaries, could be obstacle for self-sustaining, was a limitation in uplifting resource users out of poverty.

Eggert *et al.* (2015), found that there was modest growth in real income and substantial increase in inequality when comparing the Gini coefficients for 1993 and 2008 samples. The authors concluded that growth in real income was primarily accrued to the wealthier part of the population and in this case, the boat owners who enjoyed the growth in the real incomes. This had impact on the lives of the people involved in the fishery industry due to uneven distribution of revenues. Furthermore, issues of modest growth of real incomes might be related to decline of the fishery resources as well as the poor quality of the final products. The frame survey

reported that low contribution of sardines as compared to its volume was because of poor preparations hence, the hygiene and quality of the final product was impaired (URT, 2015).

### ***Business Arrangement between Processors and Traders***

Sardines trade involves fishers, boat owners, small scale processors and wholesale traders. Damien and Luomba (2011), argued that wholesale traders mostly buy sardines from small scale processors and traders who have collected the fish from the processors at landing sites. The authors further pointed out that sardines were traded by wholesale traders located at Kirumba and Muganza markets in Mwanza and Geita regions, respectively, and in Busekera and Kibuyi landing sites in Mara region. Sardines were sold at domestic and regional markets as reported by URT (2016), the domestic markets were Dar es Salaam, Tanga, Mtwara, Tabora, Morogoro, Mbeya, Shinyanga, Songea, Mbeya, and Arusha.

According Mukasa (2011) and URT (2016), the major regional markets sardines were the Democratic Republic of Congo (DRC), Burundi, Zambia, South Sudan, Kenya, Rwanda, Malawi Zimbabwe and South Africa. The major regional trading centres for sardines were located in Mwanza and Geita regions in Tanzania (URT, 2016). Damien and Luomba (2011) reported that the regional markets were accessed in groups formed by traders at Kirumba and Muganza markets located in Mwanza and Geita regions respectively. Damien and Luomba, (2011) argued that the importers take full control of the product when it arrived at the border and this arrangements existed because the importers were not allowed to have exporting licenses in a foreign country. In addition, the governments of Tanzania acknowledged that most of the sardine's regional trade was informal and hence, there were few reliable statistics regarding exporting quantities (URT, 2016).

### ***Influence of Business Arrangements Between Processors and Traders on Sardine Trade***

The business relationship between processors and traders in the sardine industry was very clearly documented by different scholars and the business arrangements at domestic and regional markets were clear. Massete, (2013) Damieni and Luomba (2011) and Burnley *et al.* (2014)) pointed out that the main processors of sardines were women who dried the fish on sand, rocks, grass and a few who dried the product on the raised racks. Luomba and Damien (2011) argued that the quality of the processed fish was low and hence, the fetches low price. The contribution of sardines to the beach value was TZS 26,947,408,000 (USD 12,536,000) equivalent to 40.4% of total value as compared to Nile perch which was TZS 34,354,987,000 (USD 15,981,000) equivalent 51.5% of the total value (URT, 2015).

In addition to the poor quality and fetching low prices of the fish products, processors did not seem to consider improving their practices right now because, they didn't see any incentives to do so. Although prices were relatively low, the demand continued to be buoyant and the prospect of receiving a higher price by processing higher quality fish was not evident to them (Damien and Luomba, 2011). Certainly, this notion had impact on the livelihood of the actors in the domestic and region markets. It evident that the vicious cycle of poverty and low income of the actors would continue and improvement of the fishing industry could be expected in the near future. It was increasingly being evident that more of the processed sardines up to 80% go to the animal feed industry because of the low quality and hence not suitable for human consumption (Damien and Luomba, 2011, Moenieba, 2016).

The regional markets, Damien and Luomba (2011) pointed two business arrangements that exist in the sardine trade. The most prevailing business



arrangement was that the fish was collected through the groups that had export license at Kirumba and Muganza in Mwanza and Geita regions respectively, the groups organized the transport and clearance of the products and took to the border with the destination country. The second arrangement was that the importers send money for buying, transporting and clearing of the products and finally, the buyer receives only a commission from the exporter Damien and Luomba (2011) argued that this arrangement existed because the exporters from other countries were not allowed to have exporting license in the foreign country. The authors reported that this arrangement was contributed by lack of capital and lack of economies of scale that did not allow or motivate traders to access more lucrative outlets for their production.

In general, the regional market needed further investigation because, although traders had formed groups for collection and exportation of sardines, their role remained collection of the product from fishers, clear the goods at the borders and transport to the border of the destination country. When the products arrived at the destination countries, the importers took full control of the product and sell to other exporters (Damien and Luomba, 2011). This showed that the exporter's role ended at the borders of the importing countries where the importers took full control and hence, it was clear that Tanzania traders did not know the real price of the product they exported. This had impact on their earnings and the same applied to actors along sardines' industry value chain.

### ***National Fishery Industry Support Institution Arrangements***

The current National Fisheries Sector Policy and Strategy statement was adopted by the Government in 1997. The strategies of this policy were based on the overall Government objectives, which aimed at poverty reduction, creation of employment

opportunities, increased food security, increased economic growth and environmental conservation (Mngulwi, 2003). Fisheries tend to be governed in a sectoral way, with dedicated Government Departments, Ministries and officers, and sectorally-defined and operated systems (Nunan and Onyango, 2016). Lake Victoria is a shared resource whose management and control of the resources on the Tanzanian side fell under the responsibility of various Ministries including, the Ministry of Livestock and Fisheries Development (MoLFD), President's Office Regional Administration and Local Government (PO-RALG) and Ministry of Water and Irrigation (MoWI) (URT, 2013).

The Directorate of Fisheries Development (DFD) in the Ministry of Livestock and Fisheries Development was responsible for supervising and coordinating the fisheries management activities including monitoring, control and surveillance. Through the Monitoring, Control and Surveillance (MCS) Unit, the DFD was responsible for law enforcement, surveillance and revenue collection from export of fish and fishery products (royalties), import and export licenses, registering and licensing fishing vessels (URT, 2013). The PO-RALG was responsible for coordinating, supporting and advising the Local Government Authorities (LGAs) on the implementation of fisheries policies and the District Executive Directors (DEDs) were responsible for implementing the fisheries policies and legislations. Councils' Fisheries Officers report to DEDs on administrative issues and to Regional Fisheries Advisors (RFA) on technical matters pertaining to fisheries (URT, 2013).

The LGAs were responsible for issuing licenses for artisanal and small-scale fisheries operations, law enforcement and surveillance, preparing by-laws and participation in formulating regulations as well as promotion of aquaculture. In order to control fishing efforts in Lake Victoria, the LGAs had the management responsibility of ensuring that artisanal

and small scale fisheries operated under licenses (URT, 2013). The Tanzania Fisheries Research Institute (TAFIRI) was responsible for carrying out research on fisheries resources in both fresh and marine waters. The Institute conducts research on fisheries resources and had a role to play in the dissemination of research findings to policy makers and other stakeholders (URT, 2010).

The development of a co-management approach began in the late 1990s under the Lake Victoria Environmental Management Project (LVEMP) support, with the formation of community-based Beach Management Units (BMUs) to facilitate resource users to participate in the management of the fisheries, working with Government and other stakeholders (Nunan and Onyango, 2016). Fisheries was among the important economic sub-sectors of the economy in Tanzania and it provided substantial employment, income, livelihood, foreign earnings and revenue to the country (URT, 2010). Due to the fact that local communities living around Lake Victoria depended on fishing as a major economic activity, the Lake's fish stocks had been overexploited for decades, and stocks are now declining with devastating socio-economic as well as environmental implications for the entire region (URT, 2013).

Based on the above concerns, in 2013, a performance audit of the management of fisheries activities in Lake Victoria was conducted by the Tanzania Controller and Auditor General in order to assess the performance of the Ministry of Livestock and Fisheries Development in monitoring, controlling and carrying out surveillance on fisheries activities on Lake Victoria. It was observed that there was no effective system in the Local Government Authorities and Monitoring, Control and Surveillance (MCS) unit to ensure that fishers used legally acceptable gears apart from what was reported during registration and number of fishers who used smaller meshed nets. Furthermore, it was noted that, there was weak

fisheries law enforcement and illegal fishers were not adequately prosecuted compared to the illegalities. Also, there was inadequate close monitoring and inspection of fishing activities (URT, 2013). The audit found that Beach Management Units had little capacity to detect illegal, unreported and unregulated (IUU) fishing due to lack of development and operations plans, lack of support from LGAs, inadequate evaluation carried out by the Ministry. It was also observed that, there was an increase of use of illegal gears in Lake Victoria (URT, 2013).

### ***National Fishery Industry Institution Arrangements Implications on Sardine Trade***

The declining fish stocks and claims of poverty within fisheries communities raise concerns about the impacts of BMUs in implementing the Fisheries Policy (Ogwang' *et al.*, 2009). The increased pressure on the fishery resources (Luomba, 2015), illegal fishing practices (Njiru *et al.*, 2008) and the growing concern that fisheries communities were the poorest (Onyango and Jentoft, 2010) despite the increased earnings accrued from the sector over the last decade, raises more questions on the impact of BMUs in fisheries management (Luomba, 2015). The Tanzania Fisheries Policy had put significant emphasis on conservation and sustainable management of fisheries resources, with little mention of objectives related to employment creation (Nunan, 2014). The same author argued that conservation had dominated the policy objectives, with little mention of employment and livelihoods. Therefore, little emphasis had been directed to objectives of fisheries trade at national and regional level that would contribute to employment and improvement of livelihood and poverty reduction. The poor performance of the available institutions supporting the fisheries industry in monitoring, controlling and carrying out surveillance on fisheries activities on Lake Victoria raises another concern on the resources sustainability and trade involving the Lake Victoria fisheries.

### ***Existing Regional Fishery Industry Support Institution Arrangements***

As Lake Victoria is a shared resource, fisheries management is influenced by national policies and legislation as well as regional agreements (Nunan, 2014). In 1947, the Lake Victoria Fisheries Services was formed to enforce fisheries laws and regulations and this was later followed East Africa Fresh Water Fisheries Research Organization (EAFFRO) in 1960, which was disbanded when the East African Community (EAC) was dissolved in 1977. Later, the Lake Victoria Fisheries Organization (LVFO) was formed in 1994 in order to ensure that utilization of the lake-associated resources is properly coordinated (Turyaheebwa, 2014, Nunan and Onyango, 2016).

The responsibility for Lake Victoria's fisheries rests with the governments of Kenya, Tanzania and Uganda, which together formed a Regional Fisheries Organization in 1997 (Nunan, 2014, Nunan and Onyango, 2016). The same authors reported that the structure of Lake Victoria Fisheries Organization includes Council of Ministers and Executive Committee, Fisheries Management and Scientific Committees, made up of directors or their delegated representatives, of the national fisheries departments and national fisheries research institutions. From 2010, representatives of fishing communities and the private processing industries joined the Executive Committee, as part of the adoption of a co-management approach.

The co-management was introduced on the Lake in the late 1990s, with the support of the Lake Victoria Environment Management Project (LVEMP) and the Implementation of Fisheries Management Plan (IFMP) and by 2006; all fisheries communities around the lake had formed community-based Beach Management Units, in accordance with national legislations and guidelines (Nunan and Onyango, 2016, Nunan, 2014, Luomba, 2015). Luomba (2015) and Nunan and Onyango (2016) argued that in Tanzania BMUs, were formed in 1990's under the

Lake Victoria Environmental Management Project (LVEMP I) and then reformed during the Implementation of a Fisheries Management Plan (IFMP) project carried out from 2005-2010. The author further reported that the change to co-management was as a result of the failure of top down approach in managing the fisheries resources and thus, it was assumed that with co-management of fisheries, the poverty levels will be improved.

### ***Implication of Regional Institutional Arrangement on Sardine Trade***

In order to find out the implications of regional institutional arrangement on national and regional markets, the review focused much on the local, national and regional levels where the fish products are produced and distributed for human consumption and animal feeds production. The review noted that Luomba (2015), reported that 90% of fishers argued that BMUs were very effective in solving conflicts, formulating laws and keeping inventories. The study found that BMU performance on data collection, patrolling fishing grounds, initiating development projects was very low. The latter were important factors for sustainable fishery resources management and development of markets at national and regional levels. This also showed that the BMUs were not sustainable if they were unable to initiate development projects for their survival and management of the fishery resources.

The inter-sectoral cooperation at the lake-wide and basin level is encouraged through the Lake Victoria Basin Commission (LVBC), formed by the EAC in 2001 and which was tasked with the harmonization of policies and laws within the East African Community (member countries in relation to environmental management, which supported economic development and poverty reduction (Nunan and Onyango, 2016). Nunan (2014) and Nunan and Onyango (2016) argued that although both the LVBC and LVFO are institutions of the EAC, there are no formal linking arrangements between them. It was

established recently that, while the LVFO was made up of the fisheries departments/ministries, the LVBC was linked to the national ministries of water, environment or natural resources. Further, the authors pointed out that while fisheries are part of the LVBC remit, and a number of projects and activities are funded by LVEMP, coordination and cooperation is limited by lack of a formalised relationship between the LVBC and LVFO and, lack of coordination of plans and budgets at the national level.

Since Lake Victoria fisheries are shared resources (Nunan, 2014), their management should also be done in an integrated way at regional level. In order for the resources to be managed in a sustainable manner, coordination of institutions, projects, plans and budgets at regional level need to be integrated. However, as noted by Nunan and Onyango (2016), this was limited by lack of formalized cooperation and coordination between the Lake Victoria Basin Commission, which was focusing on Lake Victoria resources management and Lake Victoria Fisheries Organization which mainly focuses on fisheries as part of Lake Victoria resources. Nunan (2014), pointed out that there are two approaches to fisheries management, one focused on capturing wealth and limiting access and the other on maintaining access for employment and providing community development and welfare. In order to improve regional trade of fishery resources, there is need of coordinated efforts in the resources management and improvement of the fishery industry and finally, the improvement of the livelihood of the community around the Lake.

## **CONCLUSION**

This paper aimed at reviewing the existing Lake Victoria sardine products business arrangements for local and regional markets for establishing the existing and potential business arrangements among fishers, boat owners, processors and traders and their effects to trade. In addition, the review looked at the

established national and regional support institutions and their implications to the trade of sardine products.

Regarding business arrangements among the boat owners and, fisher folks and crew members most researchers' had focused on the distribution of revenue among the boat owners and crew members. The researchers had pointed out that the fixed amount sharing before deducting the daily operating costs and percentage sharing after deducting the operation costs depending on the agreements of the owner and the crew members are regarded as more exploitative (Lokina, 2008). The same author pointed out that the crew members (including skippers) who received their share of revenues after running costs were deducted faced the risk of not receiving income at all. Researchers had pointed out that this way of revenue sharing had impact on the production as crew members' efficiency increased if the owner shared 50-50 with the crew and if they enjoyed extra bonus. Furthermore, poor sharing of revenue had been connected to theft of the fishing gears, boat engines and part of the fish products being sold before reaching the landing sites and this had direct impact on productivity as well as trade.

With respect to the business arrangement between processors and traders, most studies focused on the quality of the processed sardines and the relationship between processors and traders at national and regional levels. The reviewed papers showed that the quality of processed sardine was poor and this led to low market prices and consequently, low contribution of sardines as compared to Nile perch business. It was also observed that processors did not seem to appreciate the value of investing in quality improvement for their products because the prospects of receiving higher prices for high quality products were not evident. This called for targeted interventions in this area because, competitiveness in the market, especially access to regional markets would always be determined by the quality of products entering the market and, hence there was

no substitute for production of quality products. It was, therefore, important that capacity enhancement programmes were introduced in order to transform the practices of the actors along the value chain towards quality improvement for market access.

It was evident from this review that traders from Tanzania had not effectively penetrated the regional markets. The existing business arrangements as well as existences of weak institutional support systems had contributed to lack of economies of scale such that traders were excluded from more lucrative outlets for their products. Similarly, it was apparent that the lack or weak linkages between the various local, national and regional institutions that were established to support the fisheries sector had flawed the optimization of their potential synergies and led to inadequate support those involved in the business. These included the inability of BMUs to establish development projects for their sustainability as well as inability of LGAs to enforce laws and regulations for monitoring and controlling malpractices in the sector which threatened the sustainability of the fisheries resources and trade in general.

At regional level, it was observed that there were limited formal linking arrangements for organizations that were established to coordinate sustainable exploitation of the lake resources such as the Lake Victoria Basin Commission and Lake Victoria Fisheries Organization, both of which were institutions of the East African Community. The weak link between these regional institutions, flaws their effectiveness in coordinating the management of fishery resources for the benefit of member countries and communities in the Lake Victoria basin.

## **RECOMMENDATIONS**

Based on the findings of this review, it was recommended that relevant Government authorities should intervene to improve the working relationships between the various actors along the sardines' value chain in order to minimize exploitative tendencies. This was because, although the real

income in the Lake Victoria fisheries had been increasing, the Gini coefficient had been at an increasing rate showing substantial increase in inequality and this had impact on the livelihoods of stakeholders along the value chain.

Considering that quality of the sardines entering the market was still very low and hence fetching low prices, there was need for capacity enhancement to the value chain actors in order to improve value of their products if they had to access lucrative markets within the country, region and even beyond. Value addition technologies already existed within the country and what was needed was extending them to the communities involved in the sardine business in the Lake Victoria basin. This should go hand in hand with incentive schemes for improved quality. There was also need for enhancing the business, especially marketing skills of the local traders so that they could penetrate regional and international markets and therefore, get more profits for their products. As it was, sales agents in the destination countries seemed to get more profits than the traders who labour more on the ground. It was also recommended that further research was required with regard to the structure and dynamics of international markets for sardines and strategies for increasing the participation of traders from the country in these markets.

There was need for repositioning of the national and regional support institutions so that they provide the expected support to the industry. Furthermore, more coordination and linkage was required among these institutions in order to optimize their outputs and maximize value for their establishment. It was also considered important to review the policies and strategies governing the industry so that there was a more comprehensive approach for sustainable management and utilization of fisheries resource with the view of improving livelihoods and living standards of the people engaged in the sector as well as contribution of the sector to national income.

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