

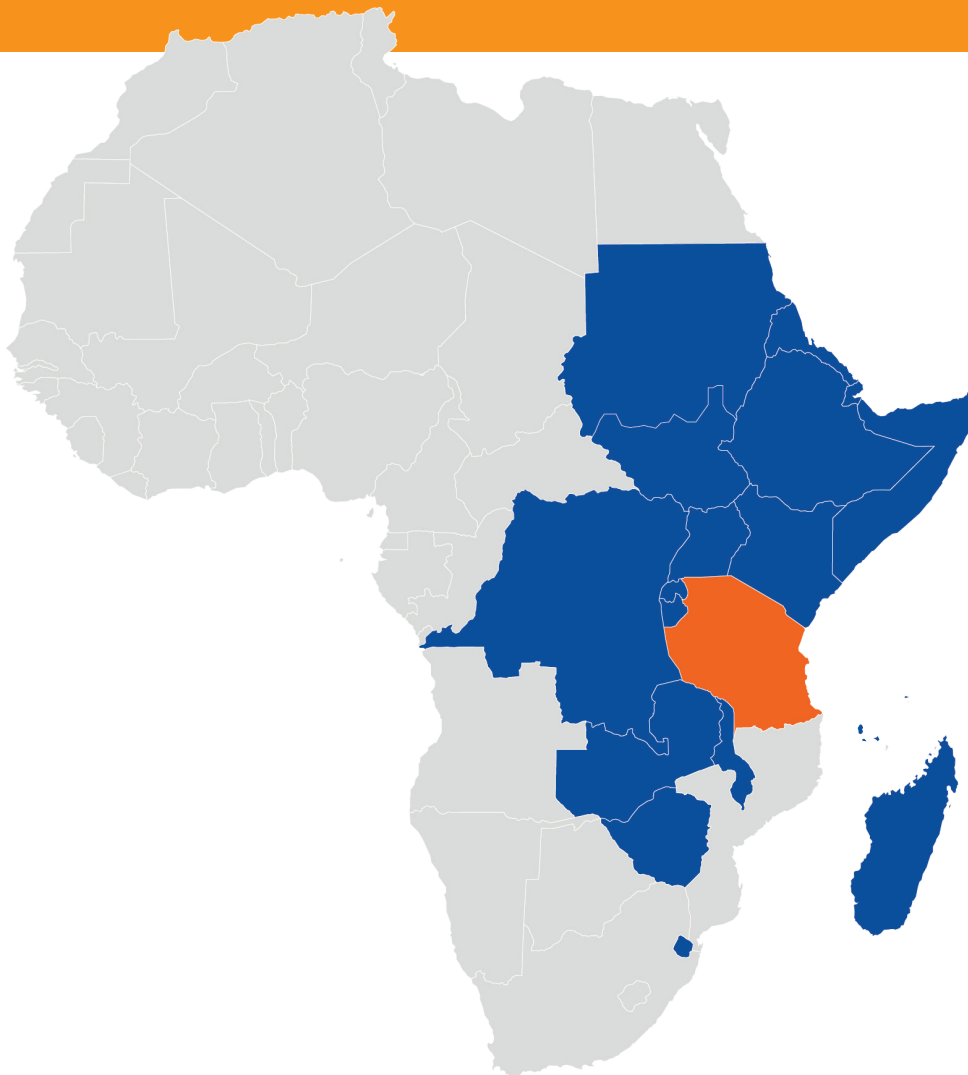


Fisheries in the ESA-IO Region: Profile and Trends

COUNTRY REVIEW

2014

TANZANIA





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This document was prepared as part of the activities of the Indian Ocean Commission (IOC) SmartFish Programme, under the FAO Fisheries management component, in the monitoring and analysis of major issues with implications for fisheries and aquaculture in the twenty countries from the Eastern Southern Africa-IOC region participating in the Programme. This has resulted in the preparation of twenty country baselines whose purpose is to serve as easy-to-read and informative references for policy decision-makers, fishery managers, development partners and stakeholders. The baselines inventory and describe for each country the trends in status of fisheries, major social and economic dynamics of relevance to the fishery sector, policy, legal and administrative frameworks, and management regimes. The present document relates to the baseline for Tanzania.

The preparation mainly involved Mr Christophe Breuil and Mr Damien Grima, FAO consultants, who made essential contribution in drafting the text and developing infographic for publication on the basis of the analysis of official and grey literature and vast field experience in the region. Much gratitude is due to all SmartFish experts who act as reviser. In particular, Ms Clotilde Bodiguel Chief Technical Adviser of IOC SmartFish activities implemented by FAO, who provided the initiative, was instrumental in the editing and Mrs Florence Wallemacq, Outreach Consultant, assisted in the formatting for publication. Lastly, the editor would like to thank National and Regional Focal Points of the IOC SmartFish Programme for providing complementary data and information.



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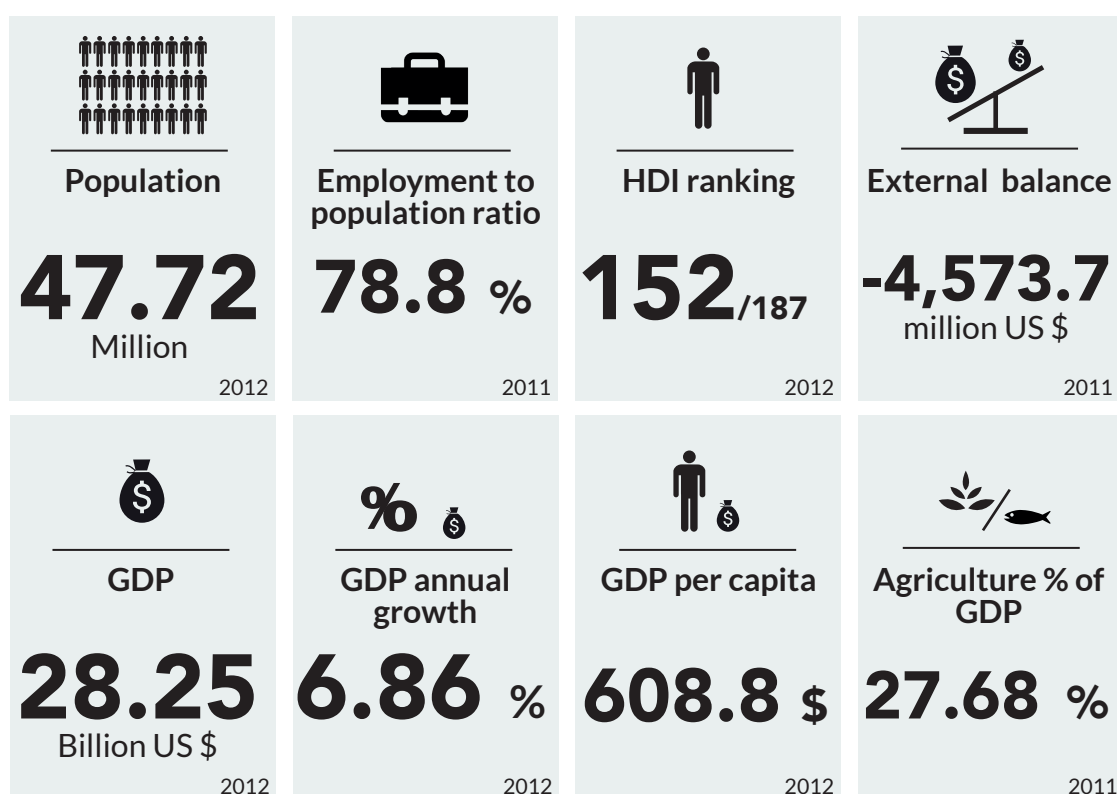


BACKGROUND INFORMATION

1 Brief on the National Economy

Key figures on Macro economic data

2014- Source World data Bank - Latest reported data



Tanzania is the largest country in East Africa with an area of about 945,200 km² and a coastline of about 1,400 km. Tanzania is well endowed with both renewable and extractive resources. Tanzania's economic growth rate has been greater than 7 percent, significantly above the sub-Saharan African average, with some deceleration following the global financial and economic crisis in 2008 (UNDAP in Tanzania, 2011-2015). The main drivers of growth have been agriculture (about a quarter of GDP in 2011), manufacturing, wholesale and retail trade, tourism, transport and communication according to the African Economic Outlook. Tanzania's medium term growth prospects are around 7 percent, thanks notably to recent discoveries of both onshore and offshore natural gas. Tanzania has seen major structural changes in its economy over the last two decades. The agricultural sector's contribution to GDP dropped from 30.6 percent in 2001 to 23.7 percent in 2011. During the same period, the share of manufacturing and services contributions to GDP increased from 8.4 percent to 9.3 percent and from 41.7 percent to 48 percent respectively. New components of economic growth, such as communications, construction, electricity and mineral extraction (including gas) will likely further enhance this structural transformation.

Whilst some structural changes in the Tanzanian economy are visible, these shifts have not benefited the labour-intensive sectors, such as agriculture or fishing, both of which experienced a decline in GDP growth rates in 2007 (UNDAP in Tanzania, 2011-2015). The agricultural sector (including fisheries) remains the largest employment sector, absorbing 75 to 80 percent of the labour force, and is the largest contributor to the country's exports (principally coffee, tobacco and sisal).

In 2012, the total GDP in Tanzania was an estimated US\$ 28.3 billion (World Bank). The GDP per capita was estimated at US \$628 in 2012, showing a significant increase of 23.6 percent when compared to 2011 (OECD et al. 2013). The population was estimated at 47.7 million inhabitants in 2012 (approx. 1.3 million people living in Zanzibar), with an annual growth rate of 2.9 percent.

National development strategies and plans recognize the private sector as an engine for growth. Fiscal and monetary policies have been substantially reformed in recent years and progress has been made in regulatory reforms and governance. However, the business environment has slightly deteriorated in recent years due in particular to difficulties in accessing electricity and congestion at the Dar es Salaam port. According to the World Bank's 'Doing Business 2013' report, Tanzania ranked 134 out of 183 economies in its ease of doing business in 2013.

Inflation in Tanzania has been greater than 10 percent since 2011 as a result of increased food and fuel prices. Inflation was close to 16 percent in 2012 (OECD et al. 2013).

Tanzania remains an active participant in a number of regional trading agreements and regional economic communities, the most important of which are the EAC and SADC. The country has made considerable progress in promoting participation and accelerating regional integration through tariff reductions, in line with signed protocols. Tanzania is implementing the EAC Common Market Protocol, operational since July 2010, and continues to play an important role in the establishment of a common market in the SADC zone (OECD et al. 2013).

Tanzania's exports of goods and services reached US \$2.7 billion in 2012, whilst imports of goods reached US \$12.7 billion, resulting in a negative current-account balance amounting to US \$3.4 billion in 2012. The current-account balance however, significantly improved in 2012 compared to 2011, as a result of higher prices on the world market for traditional Tanzanian agricultural products and a rise in gold prices. Manufacturing exports contributed 20 percent of total exports in 2012.

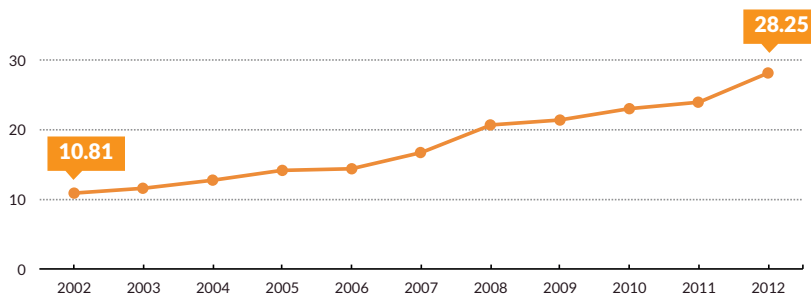
A key feature of Tanzania's export performance has been market diversification away from the EU. Over the period 2000-2011, exports to the EU dropped from approximately 50 percent to 30 percent of total exports, whilst exports to Asia and Africa rose from 23 percent to almost 30 percent and from 10 percent to over 30 percent respectively (OECD et al. 2013).

The active population in Tanzania was estimated at 21.8 million people in 2012 (OECD et al. 2013).

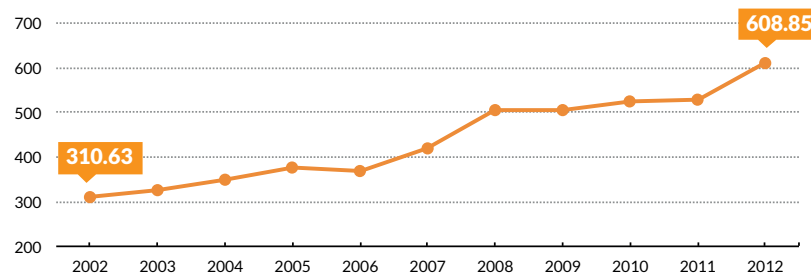
Trends

2014 - Figure 1-5 - Source World Data Bank - Last ten years

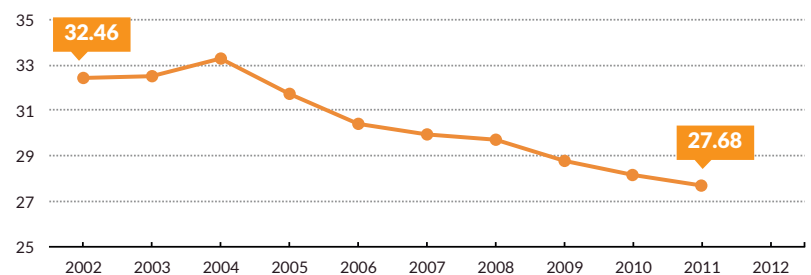
GDP (current billion US \$)



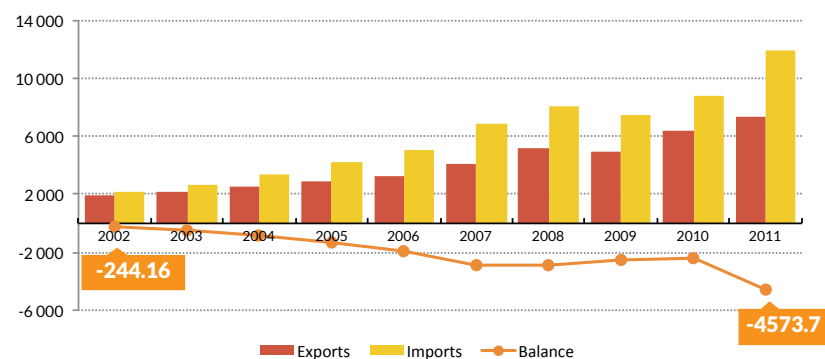
GDP per capita (current US \$)



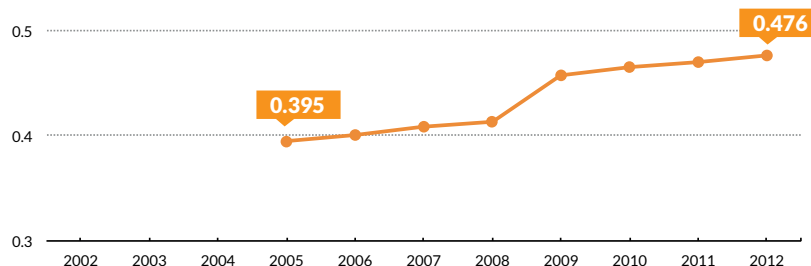
Agriculture % of GDP



Trade balance (current million US \$)



Human Development Index



As mentioned above, the agricultural sector remains the largest provider of employment, employing approximately 75 to 80 percent of the country's workforce.

Despite the growth of the economy, poverty has remained prevalent and stagnant in Tanzania over the last decade. Underperformance of the agricultural sector (which had a moderate economic growth of 3.1 percent in 2011) has been a key factor in jobless growth and chronic unemployment. About 13 million people (34 percent) are living below the basic needs poverty line (UNDAP in Tanzania, 2011-2015).

Tanzania's Human Development Index (HDI) puts the country in the 'low human development' category. With an HDI score of 0.476, Tanzania ranked 152nd out of 187 countries in 2012.

2. Policy and Planning Framework

2.1. General Framework

Tanzania is composed of the Government of the United Republic of Tanzania (URT), guided by the Constitution of 1977 and the Revolutionary Government of Zanzibar, guided by the Constitution of 1984.

The overall policy and planning framework is provided in the National Strategy for Growth and Reduction of Poverty (NSGRP, known as MKUKUTA under its Kiswahili acronym) for the mainland and the Zanzibar Strategy for Growth and Reduction of Poverty (ZSGRP, known as MKUZA under its Kiswahili acronym) for Zanzibar.

Mainland Tanzania launched a second NSGRP/MKUKUTA II for the period 2011-2015. This strategy continues the focus on economic growth, reducing poverty, improving living standards and social welfare, enhancing good governance and accountability. Likewise, Zanzibar has articulated its development priorities for poverty reduction in a second ZSGRP/MKUZA II, also covering the period 2011-2015.

Longer-term national development aspirations for high and shared economic growth, quality livelihoods, peace, stability, unity, good governance and international competitiveness are outlined in the Vision 2025 (mainland) and Vision 2020 (Zanzibar), together with the three outcome-oriented clusters of the MKUKUTA II and MKUZAI that are: Growth for reduction of income poverty; Improvement of social services and well-being; and Good governance and national unity (UNDAP in Tanzania, 2011-2015).

The fishery sector is included in the first cluster, which is primarily intended to address economic growth challenges. This cluster has one broad outcome, namely "achieve and sustain equitable pro-poor growth", along with the following four goals: Create an enabling environment for growth; Promote sustainable and equitable pro-poor and broad based growth; Reduce income poverty and attain overall food security; and Create a vibrant private sector for economic growth.

2.2. Food Security Strategy

The vision of the URT with reference to food security is provided in the National Food Security Policy (NFSP) of 2005. The vision is to envisage a sustainable food supply, access to adequate food and proper utilization of safe food to meet nutritional needs for all citizens by 2025. The mission of the NFSP is to promote sustainable aggregate food production and productivity, trade, accessibility and utilization of safe and nutritionally balanced food. The broad objective of the NFSP is to ensure availability, accessibility and utilization of adequate, safe food to meet nutritional needs for all people on a sustainable basis. Specific objectives are to: (i) Promote sustainable food availability

through increased production, productivity and trade; (ii) Support mechanisms for ensuring that all people have sustainable access to adequate food; and (iii) Uphold highest possible levels of health and nutritional status of the population at all levels through improved utilization of food.

More recently, the URT developed a National Nutrition Strategy (NNS) that states the priorities of the Government of Tanzania for the period July 2009 to June 2015: “to ensure that the nation and its people are properly nourished”. The NNS is in-line with, and will contribute to, the National Development Vision 2025, MKUKUTA, the African Regional Nutrition Strategy (2005-2015) and other policies and strategies of the government.

2.3. Fisheries in Public Policies

Under the institutional arrangements of the United Republic of Tanzania, inland fisheries, marine fisheries in territorial waters (within 12 nm) of the mainland and Zanzibar (including Pemba), as well as in internal waters (marine waters on the landward side of the islands from the baseline of the territorial waters and waters equidistant between the mainland and Zanzibar), are non-union matters. On the other hand, fisheries in Tanzania’s Exclusive Economic Zone (EEZ) are a union matter and are regulated by the Deep Sea Fishing Authority (DSFA). This implies that the management of marine fisheries in Tanzania is carried out at three policy and institutional levels: mainland Tanzania, Zanzibar and the DSFA. Inland fisheries are managed through mainland institutions, whereas the management of aquaculture is carried out at two levels, i.e. the mainland and Zanzibar.

In the national policy documents, the fisheries and aquaculture sector is usually considered, along with other sectors, under a general definition of agriculture. However, when special reference is made, it is assessed as a key sector of national food security, and fisheries and aquaculture are considered to play a vital role in food security and income generation in some communities.

As mentioned above, fisheries are mentioned in the Visions and Poverty Strategies of the mainland and Zanzibar. Fisheries are expected to contribute to the economic growth of the country and to food security.

With regards specifically to Zanzibar, it should be noted that Vision 2020 highlights the need to strengthen the management of marine and coastal resources to support sustainable tourism development whilst conserving the richness of the environment. The Vision also recognizes the key role played by the fishery sector in the social and economic development of the country. The Zanzibar MKUZA II recognizes that fisheries are of great importance to the economy of Zanzibar. It also stresses that recent government efforts have been directed to the conservation of marine and coastal environments and that this has largely contributed to significant increases in fish catch. Despite this positive performance, the Strategy highlights that marine resources are still underutilized as most fisheries activities are undertaken in the inshore waters, which are unsustainably over-exploited. It also emphasizes that there is a great potential on the part of domestic fishers for offshore fishery expansion in Zanzibar.

Furthermore, it should be noted that a Tanzania Agriculture and Food Security Investment Plan (TAFSIP) exists, which is a ten-year investment plan, with the goal of a 6 percent annual growth in the agricultural GDP. This document uses a broad definition of the agricultural sector, to include all forms of agriculture, livestock, fisheries, forestry, irrigation and natural resource management. According to the TAFSIP, Tanzania’s production is dominated by small-scale subsistence producers, and this includes fisheries. The fishing sector has been growing at around 5 percent per year, but is affected by the over-exploitation of inshore resources and underutilization of deep sea resources (Kurien, John. López Ríos, Javier. 2013). Over-exploitation is primarily focused on the Nile Perch fishery, rather than tilapia, small pelagics and others.

3. Fishery Resources

Fisheries in Tanzania are dominated by inland fisheries with a contribution of a minimum 85 percent to the national fish production, mainly from Lake Victoria and to a lesser extent Lake Tanganyika. Marine fisheries contribute 10-15 percent to the national fish production and aquaculture (excluding seaweeds) is negligible. According to official data (FAO FishStat), current fish production is approximately 340,000 MT per year, excluding catches of tuna and tuna-like species by Distant Water Fleet Nations (DWFN) in the EEZ.

The marine fishery waters comprise coastal waters that extend over a 1,240 km shoreline including major islands such as Unguja, Pemba and Mafia, and offshore waters. The coast generally has a steep, narrow, continental shelf covering a total surface area of about 17,900 km². The coastal zone is generally composed of rocky islets, sandy beaches, lagoons, mangroves and coral reefs. The coastline is affected by the monsoon regime, with two typical seasons: the southeast monsoon from May to early September, and the northeast monsoon from November to March. Coastal waters are also influenced by the north flowing East African Coastal (EAC) current (Fennessy et al. 2012). The surface area of Tanzania's EEZ is 242,000 km².

Domestic fleets targeting marine fish species in Tanzania are essentially made up of artisanal multi-gear and multi-species fisheries operating in coastal and shallow waters. Coastal marine resources of special significance are composed of small and medium pelagics, demersal fish in deep water and coral reef areas, and lagoons and intertidal species. Small pelagics include scads, herring and anchovy. Medium pelagics include Spanish mackerel, bonito, barracuda, mackerel and wolf herring. Demersal species include different species of shark, ray, skate, sole, catfish, and shrimp. Coral reef fishes include emperors, snappers, sweetlips, parrotfish, surgeonfish, rabbitfish, groupers and goatfish. The lagoon and intertidal pond species include octopus, squid, crabs and a variety of bivalves. There is also an artisanal fishery targeting tuna and tuna-like species.

The main species in the EEZ are the highly valued tropical tuna and tuna-like species that seasonally migrate to Tanzanian waters. The main tuna species found in the EEZ and adjacent high seas are *Thunnus albacares* (Yellowfin tuna), *Katsuwonus pelamis* (Skipjack tuna), and *Thunnus obesus* (Bigeye tuna). Large pelagic sharks in significant quantity are also found in the Tanzania EEZ.

Recent comprehensive assessments of the marine fisheries potential are unavailable. The marine fishery potential of Tanzania's inshore waters is estimated at 100,000 MT per year based on a stock assessment survey conducted in the early 1980's. There is no estimate of the fish potential in the Tanzania EEZ.

According to WIOFISH classification, which is based on the type of gear that is used, there were 35 fisheries in the WIOFish database in 2012, with the majority active in the artisanal sector. Classified fisheries included 28 artisanal, 26 subsistence, 11 small-scale commercial, 2 industrial, 2 semi-industrial, 2 tournament fishing, 1 foreign fleet, 2 sport and 3 recreational. Fisheries are multispecies with catch composition data including 165 different catch items.

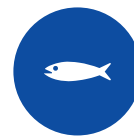
Tanzania's inland water resources cover a surface area greater than 50,000 km² when the three major internationally shared lakes are considered: Lake Victoria (approx. 33,300 km²), Lake Tanganyika (approx. 13,400 km²) and Lake Nyasa (approx. 300 km of shoreline). According to the FAO Country Profile, 2007, other inland fisheries of commercial importance are dams such as Mtera and Nyumba ya Mungu and riverine systems, with the major rivers being Pangani, Wami, Ruvu, Rufiji and Ruvuma all emptying into the Indian Ocean.

Lake Victoria is the second-largest freshwater body in the world, with a surface area of 68,800 km², of which about 51 percent is in Tanzania. Lake Victoria has a multi-species fishery of tilapiines and haplochromines, cichlids and more than 20 genera of non-cichlid fish, including Mormyrus, catfish, cyprinids and lungfish. The fisheries are dominated by three fish stocks: Nile Perch (*Lates niloticus*), sardines (*Rastrineobola argentea*) locally known as Dagaa in the Tanzanian part of the lake, and Nile

tilapia (mostly composed of *Oreochromis niloticus*). Other important stocks include Haplochromine cichlids and catfish (*Clarias gariepinus*) (Anderson, Jim. 2011).

Lake Tanganyika is known internationally for its endemic cichlid fish fauna that comprises a genetically diverse demersal community assemblage. The pelagic fish community primarily comprises six endemic species including small pelagics (*Limnothrissa miodon* and *Stolothrissa tanganicae*) and their major predators, four members of the genus *Lates* (*L. stappersii*, *L. angustifrons*, *L. mariae*, and *L. microlepis*). *L. Stappersii* and *S. tanganicae* live exclusively in the offshore zone and comprise 90 percent of the catches from the lake fishery (Petit, Philippe. Shipton, Tom. 2012). The lake has a surface area of 32,600 km², with Tanzania controlling about 41 percent in terms of jurisdiction.

The surface area of Lake Nyasa is an estimated 29,500 km². The lake's shoreline in Tanzania extends up to about 300 km. The lake is one of the deepest in the world with a maximum depth of up to 700 m (the layer below 220 m is anoxic and thus no fish are found below this limit). The nearshore coastal topography in Tanzania is mainly rocky. The lake can be classified as oligotrophic to mesotrophic (i.e. low to medium fish productivity). Dominant commercial species are made up of small pelagics, (notably *Engraulicypris sardella* (usipa) and *Copadichromis spp* (utaka), which represent about 70 percent of the lake's total catch.



KEY INFORMATION AND FIGURES ON THE FISHERY AND AQUACULTURE SECTOR

4. Marine Fishery Sector

4.1. Status of Resources

The lack of data in Tanzania does not enable a satisfactory assessment of the status of marine stocks, with the notable exception of the more important large pelagic species that are under the mandate of the Indian Ocean Tuna Commission (IOTC). The status of marine fish stocks is therefore principally estimated using methods based on observations and scientific and expert judgment.

In general, it is widely accepted that overfishing in inshore areas has continued to cause a decline in fish catches, whilst the deeper coastal waters remain moderately exploited due to lack of capacity by local fishers to operate further off-shore.

Pelagic species are generally considered to be moderately to fully-exploited, whereas most of the stocks of demersal resources are considered to be fully or over-exploited.

On the mainland, a study on the trend of fish catches was conducted in 2010 based on interviews with fishermen (Cochrane, K.L. Japp, D.W. 2012). About 82 percent of fishers acknowledged that there was a decreasing trend in fish catch due to several factors including notably the use of destructive fishing practices (such as dynamite fishing, dragging nets in shallow waters and beach seining) and a steady increase of fishing effort in the inshore zones. In Zanzibar, the use of destructive practices is less but fish stocks in shallow waters are also considered vulnerable by scientists and experts due to the continuous increase of fishing capacity and effort.

The prawn fishery on the mainland used to be considered under threat and a fisheries management plan was developed in the early 2000's. The industrial component of the prawn fishery has also been suspended since 2007.

The populations of coastal tunas and related species in SWIOFP countries, including Tanzania, are largely under-exploited or moderately exploited with only a few being fully-exploited and two being over-exploited (Cochrane, K.L. Japp, D.W. 2012). The draft Tanzania Tuna Strategy of 2012 also states that "the Tanzanian pelagic tuna and related species namely the yellowfin, big-eye, albacore, skipjack tuna swordfish and the marlins have been described as underexploited according to FAO, 2008".

4.2. Major Fishery Dynamics in the Artisanal Sub-Sector

Since the closure of the industrial prawn fishery in 2007, domestic marine fishing is carried out by artisanal fishing units. The bulk of fishing activities takes place in inshore waters within the reef ecosystem whilst some advanced artisanal units, mostly targeting small, medium and large pelagics, operate further off-shore in deeper waters both in the territorial and internal waters.

Key challenges in the marine artisanal sub-sector for both the mainland and Zanzibar are regulation of the inshore fisheries in shallow waters where the status of resources and individual catch rate are alarming and the promotion of off-shore fishing in deeper waters where resources are generally considered as moderately exploited.

According to the 2009 Frame Survey, fishing activities on the mainland were undertaken by about 36,320 fishers, 7,000 of which were foot fishers. Most fishing crafts are small - generally not exceeding 10 m - and can hardly go beyond the reef, particularly during the southeast monsoon



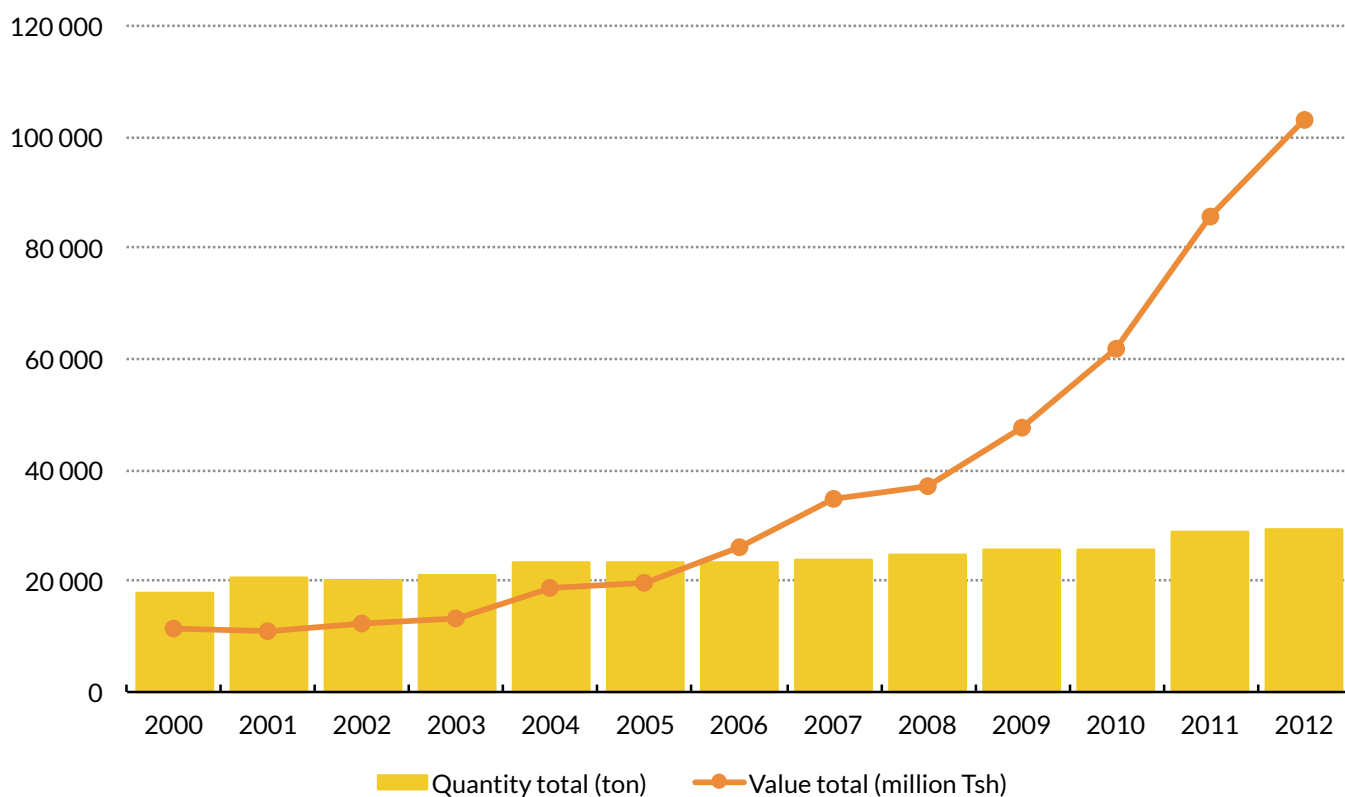
due to the strong winds and rough seas. Approximately 7,660 fishing crafts, composed of wooden planked boats, dhows, dugout canoes and outrigger canoes, were inventoried in 2009: approximately 11 percent of these crafts were motorized. The most common fishing gears used included gillnets, hand-lines, long-lines, traps, shark nets and cast nets. Ring nets, beach seines (illegal) and spears were also used. The total number of landing sites, observed during the 2009 Frame Survey, was 257, of which 67 were temporary.

The general trend in the marine artisanal fishery on the mainland is a steady increase of fishing capacity and effort. Comparative results between the frame surveys of 2007 and 2009 showed that in the 2 years between the surveys, the number of fishers using fishing vessels increased by 4.6 percent and the rate of motorization increased by 9.7 percent. Furthermore, the number of beach seines increased by 25 percent from 2007 to 2009 and dynamite fishing continued to be an issue.

In Zanzibar, where fishing techniques are similar to those observed on the mainland, the situation is slightly different when referring to the use of illegal techniques and particularly dynamite fishing, which is not an issue in Zanzibar. On the other hand, Zanzibar’s fisheries also face a steady and significant increase of fishing capacity and effort in the inshore zones, as well as a persistence of illegal beach seining. In Zanzibar, it is believed that the development of the tourism industry and the resulting increase of fish prices has created considerable incentive for increased fishing capacity (see Figure 6 below).

Trend in marine fish production, Zanzibar

2014 - Figure 6 - Source Zanzibar Fisheries Administration



According to the 2010 Frame Survey, fishing activities in Zanzibar were undertaken by about 34,751 fishers, 7,400 of which were foot fishers. About 8,640 fishing crafts were inventoried in 2010, with a rate of motorization of 15.6 percent. Between 2003 and 2010 the number of fishing

gears considerably increased (e.g. x 7 for gillnets and x 2 for longlines). Between 2007 and 2010, for which more details are available, the total number of purse seines, seine nets and ring nets increased by 15 percent on average. It should be noted that the owners of such fishing units are mostly local investors and not fishers. During the same period, the total number of fishing craft increased by 20.7 percent.

On both the mainland and Zanzibar, there is competition for the use of coastal areas between various resource users, which has increased the intensity of conflicts amongst various stakeholders. Conflicts between fishers using beach seine and ring nets versus other gear are frequent. Conflicts between sedentary fishing communities and migrant fishers are also important. In Zanzibar only, conflicts between fishers and seaweed farmers, as well as between fishers and the tourism industry are frequent.

A recent socio-economic study on FAD fisheries in SWIO (Failler et al. 2011) observed that Tanzanian skippers are, on average, relatively young, which may be an indication that fisheries are in a development stage. This could also be an indication that young people from fishing communities still have difficulties to diversify income-generating activities.

4.3. Major Fishery Dynamics in the Industrial Sub-Sector

There was a small fleet of Tanzanian trawlers targeting prawns and operating in the territorial waters. This domestic fleet is not operational since the close of the prawn fishery in 2007.

Fishery resources in the EEZ are currently exploited by DWFNs through a licensing system under a regime of a 'private access agreement'. In 2010, Tanzania, through the DSFA, issued 50 licences to mostly European tuna vessels, of which 34 went to tuna purse-seiners and 16 to tuna long-liners. In 2011, the DSFA licensed 38 purse-seiners (Tuna Strategy, draft 2012).

The conditions attached to DWFN fishing licences do not include the obligation to land or tranship (part of) catches from the Tanzania EEZ. Catches of tuna from the Tanzania EEZ are not known due to the absence of effective data reporting, which is a direct result of the lack of observers on-board fishing vessels.

It is estimated that the total catch of tuna and tuna-like species by foreign industrial fleets in the Tanzania EEZ is about 20,000 MT per year (Failler et al. 2011).

4.4. Fishery Production

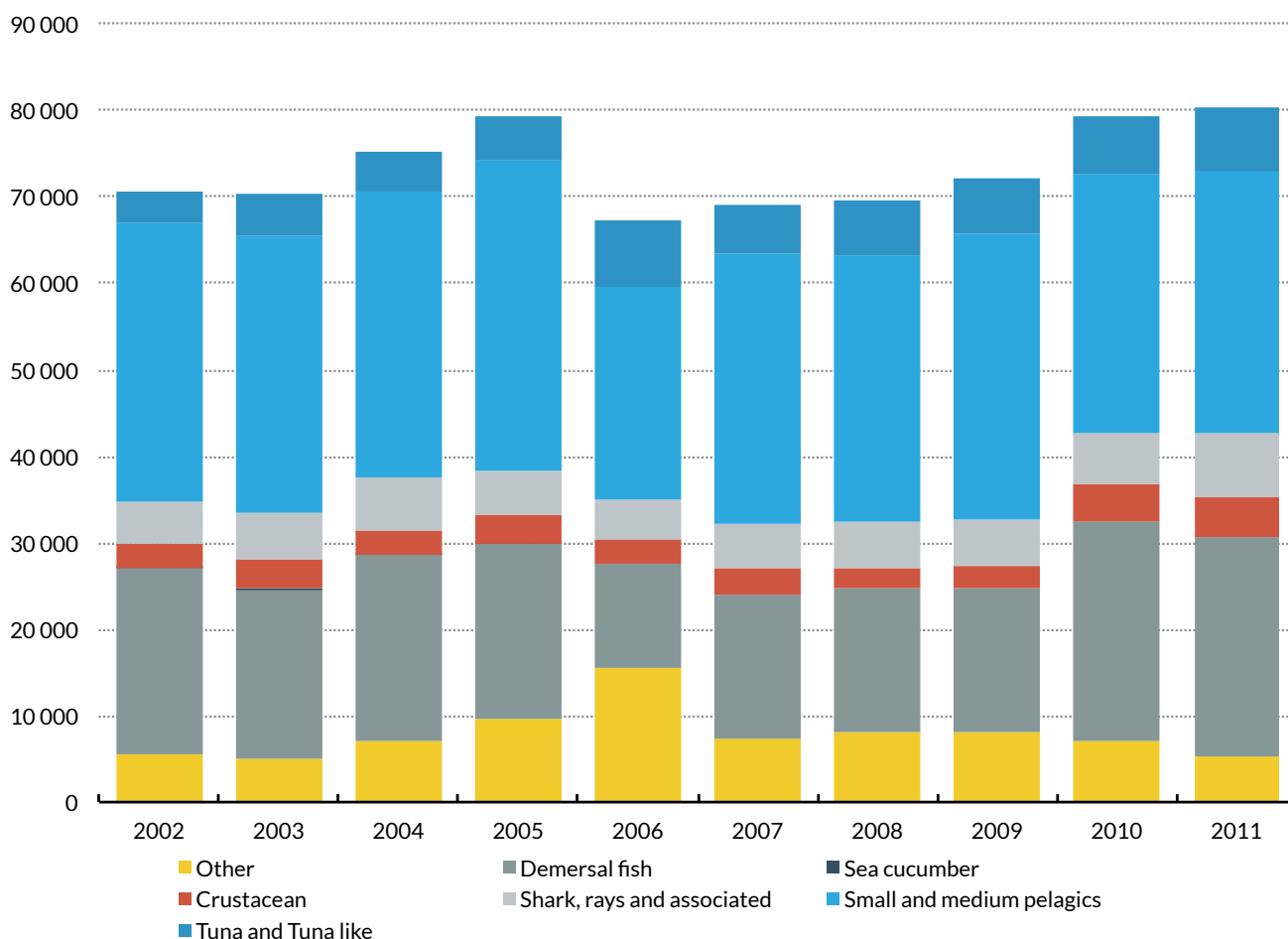
As shown in Figure 7 below (FAO FishStat), domestic marine fish production has been more or less stable in Tanzania over the last 10 years, with production averaging 50,000 MT per year when cumulating data from both the mainland and Zanzibar. Landings are dominated by demersal reef and reef associated species, and pelagic fishery species caught mainly in the inshore waters.

Cochrane and Japp (SWIOFP. 2012) mention that "the Fisheries Department of Tanzania (FDD) reported on findings by Berachi (2003) that small pelagic fish such as sardines, anchovy, small mackerel and horse mackerel accounted for approximately one-third of the total catch from the marine artisanal fisheries of the mainland".

Based on recent official data from the Zanzibar Department of Fisheries Development (DFD), the share of small pelagics in total fish landings in Zanzibar averaged 21 percent between 2001 and 2012. In the same period, total fish production increased by an average of 4 percent per year, reaching 29,000 MT in 2012. This steady increase of fish landings in Zanzibar can be explained by possible statistical biases or by a continuous extension of fishing areas into further off-shore, deeper waters.

Domestic marine fish production in Tanzania (in tons)

2014 - Figure 7 - Source FAO FISHTAT J (2002-2012)



4.5. Fish Utilization

In Tanzania (both mainland and Zanzibar), fish is mainly consumed fresh or traditionally processed in smoked, sun-dried and salted-sun dried products (FAO, 2007-2016). Contribution of the marine fishery sector to exports is low. This is the result of a combination of factors including the absorption of fish production by local markets – even if marine products face fierce competition from inland products, preferred by inland communities - and poor quality control systems that make it difficult to meet international export standards. However, some demersal fish, lobsters, octopus, squid, dried sea cucumbers, hard shells, shark fins and skins of groupers are amongst the most valuable species exported to Kenya, European countries, United Arab Emirates (UAE) and others.

Furthermore, most fishers in Tanzania rely on a portion of their catch for their own family food security. Only six fisheries, out of a total of 35 fisheries, as defined by WIOFISH, that were listed as not contributing to food security in 2012.

In Zanzibar, most of the fish catch is locally consumed on the same day as caught. Only a small amount of the pelagic catch and those landed late in the day are preserved using refrigeration. At the landing sites or markets, fish are mainly sold by auction. Despite the large local demand for fish, the distribution of fish to consumers faces various constraints including weak marketing channels



and lack of storage facilities. At the same time, the price of fish is steadily increasing, which may reflect the scarcity of the supply and the increased demand for fish, particularly from the tourism industry. A large volume of the small pelagic catch is processed at landing sites by various groups and is packed in large sacks (approximately 100 kg per sack). The majority of the catch is exported to the DRC, where buyers and their agents come directly to the beaches to collect the mainly dried, or salt-dried fish. Some of the catch is consumed locally and some moves on to Dar es Salaam. Attempts are being made to improve the quality of the processing of small pelagics and new packaging ideas are started to yield higher prices for processors.

In Zanzibar, one issue related to food security has to be highlighted. This relates to the increased share of high value, good quality fish that is being taken by the tourism industry to the detriment of local consumers.

4.6. Infrastructures

Tanzania does not currently have suitable port facilities to service industrial fisheries, including the offshore tuna fleet. This is believed to be a serious constraint for the possible development of a domestic tuna fleet.

In the artisanal sub-sector, landing site facilities are very basic and the sub-sector is constrained by inadequate infrastructure, including a lack of capacity for processing, storage and transportation facilities. Post-harvest fish losses (quantity or value) due to a lack of storage, processing and marketing facilities are estimated to be in the order of 20 percent.

The 2009 Frame Survey indicated that there were a total of 257 landing sites on the mainland, of which 149 (57 percent) were accessible by all-weather roads, 135 (52 percent) had a good water supply and approximately 100 had gear and boat repair facilities.

In Zanzibar, there are approximately 30 official fish landing sites, essentially natural sandy harbours. At landing sites where tidal differences are large (about 4 m), fishing boats are forced to moor several hundred meters away from the anchorage site and access to the boats is difficult during high tides. Due to a lack of mooring facilities, fish catches are often unloaded onto small canoes before being landed.

5. Inland Fishery Sector

5.1. Status of Resources

The main catches in the inland fishery sector are composed of several species of perches of the genus *Lates* (*L. niloticus*, *L. stappersii*, *L. angustifrons*, *L. mariae*, and *L. microlepis*), small pelagics (*Rastrineobola argentea*, *Limnothrissa miodon*, *Stolothrissa tanganicae*, *Engraulicypris sardella* and *Copadichromis spp*) and tilapine species including *Oreochromis niloticus*. Other important stocks include haplochromines and catfish.

Most of freshwater fish resources are considered fully or over-exploited. This is notably the case for the strategic resources that are the Nile Perch in Lake Victoria and the tilapine species. Small pelagics, notably Dagaa (*Rastrineobola argentea*), form the bulk of the main catches from Lake Victoria and although data is lacking, do not show symptoms of over-exploitation.

On Lake Victoria, there has been a steady decrease in terms of fish diversity and quantity due to the significant increase in fishing effort (both legal or illegal) resulting from the open access regime. Furthermore, a lucrative regional trade in immature fish (primarily immature Nile Perch), supported by high-level corruption has exacerbated the decline of fish stocks (Gitonga, Nancy. 2013). Other

factors, such as the overall degradation of the environmental quality of the lake, have also negatively impacted the status of fish resources.

On Lake Tanganyika, which is the other major lake fishery in Tanzania, there are indications of reduced catches, changes to catch composition, and in some areas fish stocks have already collapsed as stressed in the Strategic Action Programme, 2000, of the Lake Tanganyika Authority (LTA). These changes are most marked in the extreme northern and southern parts of the lake (Petit, Philippe. Shipton, Tom. 2012). Factors that have led to such a situation are the same as those described above for Lake Victoria.

5.2. Major Fishery Dynamics in the Sector

Inland fishing activities in Tanzania are mainly carried out by artisanal fishers using small un-motorized fishing craft propelled by sail and paddle. The fisheries are mostly multi-gear and multi-species artisanal fisheries. Fishing gears include gillnets, long-lines and seine nets. The existence of a 'semi-industrial' fishery on Lake Tanganyika, operating with lift-nets (Catamaran and Apollo), should also be noted. In addition, the prevalence of illegal gears such as under-sized nets, beach seines, monofilament gillnets and cast nets on both Lake Victoria and Lake Tanganyika should also be highlighted.

In the Lake Victoria fisheries, fishing units are mostly artisanal with only a small proportion (26 percent) of motorized crafts. Fishing effort is therefore mostly confined to the inner margins of the lake. Frame surveys, regularly conducted by the Lake Victoria Fisheries Organization (LVFO), indicate a steady increase in the overall fishing capacity over the last decade: +50 percent for crafts, x4 for motorized crafts, +50 percent for fishers, and a tremendous increase in the number of gears. The 2012 Frame Survey indicated that the Lake Victoria fisheries for Tanzania involved 101,250 fishers and 28,500 fishing crafts. Furthermore, in Tanzania, the number of outboard engines increased from 1,450 in 2000 to 8,900 in 2012.

On Lake Tanganyika, the 'semi-industrial' component primarily operates in the offshore areas targeting the clupeid and Lates species groups. Artisanal fishers primarily operate in the inshore area targeting juvenile *Limnothrissa miodon* and demersal components. A 2011 Frame Survey conducted by the LTA revealed that there were a total of 93,000 fishers, of which 26,600 were Tanzanian, operating 36,675 fishing crafts, of which 11,500 were located in Tanzania. Tanzanian fishing gear in use on Lake Tanganyika includes almost 1,900 lift-net fishing units.

On Lake Nyasa, fisheries are still extremely artisanal and are sometimes of a subsistence nature on the Tanzanian side. Fisheries are dominated by small pelagics with fishing units operating at night with open water seine nets. In 2002, 30 boats, 2,000 canoes and 600 open water seines units were inventoried on the Tanzanian side of the lake.

5.3. Fishery Production

In 2010, Lake Victoria fisheries contributed an estimated 243,000 MT, valued at approximately US\$ 400 million, to Tanzania's national fisheries production (Anderson, Jim. 2011). This figure may however be an underestimate given that total fish production in Lake Victoria was estimated at 808,000 MT according to LVFO statistics in recent years.

Total fish production on Lake Tanganyika ranges between 160,000 and 200,000 MT per year. Considering that Tanzania has 41 percent jurisdiction of the lake, Tanzania's fish production in Lake Tanganyika may be close to 70,000 MT per year.

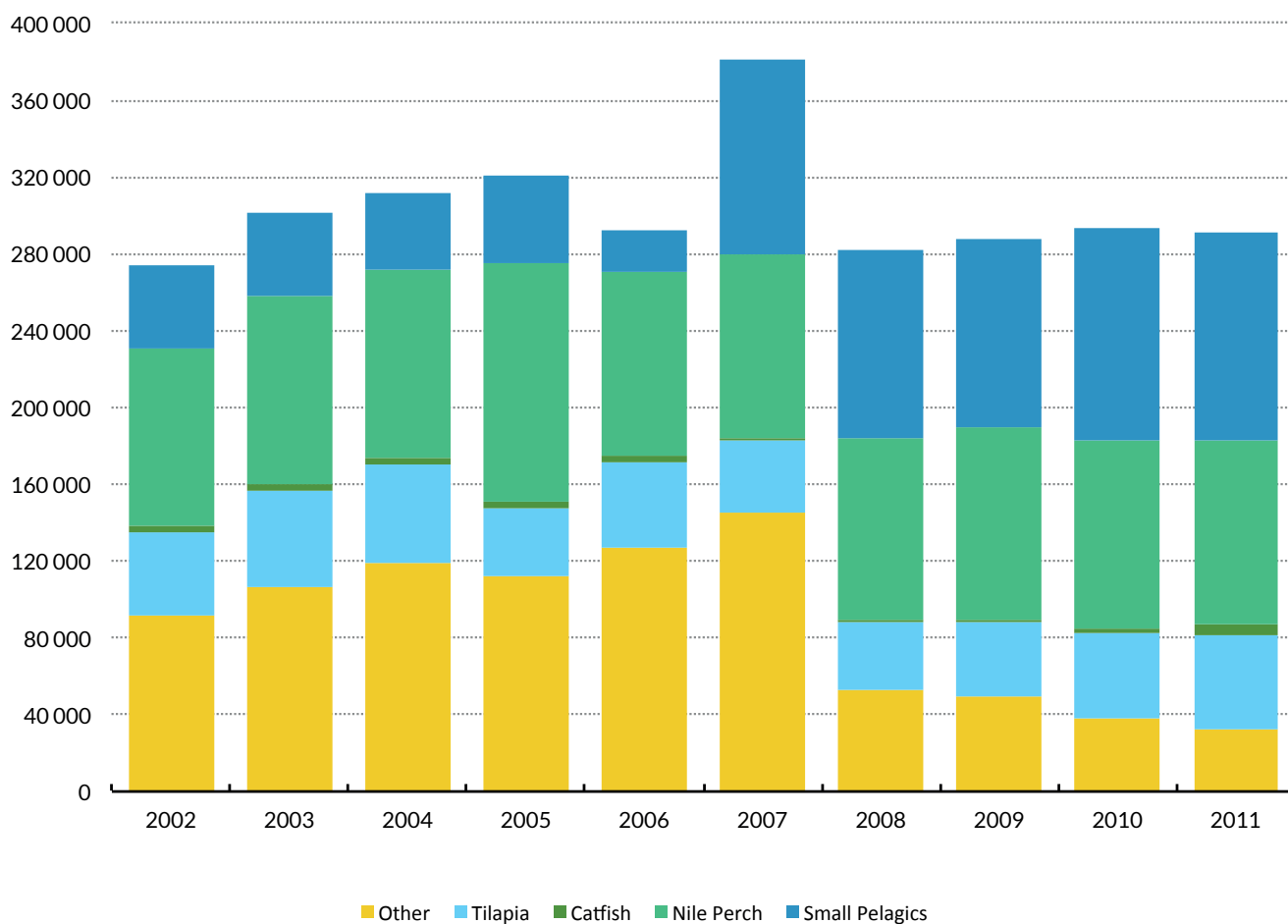
Tanzania's fish production from Lake Nyasa was estimated at 4,350 MT in 2008.

Based on the above, the overall freshwater fish production may be greater than 320,000 MT

per year, whereas official data (FAO FishStat) indicates a total freshwater fish production of approximately 290,000 MT per year.

Domestic Inland fish production in Tanzania (in tons)

2014 - Figure 8 - Source FAO FISHTAT J (2002-2011)



5.4. Fish Utilization

The main consumer markets for fish and fisheries products from Tanzania are the domestic market and neighbouring countries including the SADC region. Asian countries and the European Union (EU) are the main market for Nile Perch fillets from Lake Victoria (FAO Country Profiles, 2007). With regard to fish utilization in Tanzania, efficient fisheries resource utilization and marketing is constrained by inadequate infrastructure such as roads, fish markets, landing sites, cold chain and storage facilities, laboratories, fish handling and processing facilities (Defaux V. Hjort, A. 2012).

The majority of Nile Perch from Lake Victoria is exported as fillets to international markets including the EU, Middle East, Japan, the United States of America and Australia. The Nile Perch contributes a significant amount of foreign exchange earnings in Tanzania. Besides any formal exports, there is a considerable unregulated regional market, composed mainly of juvenile Nile Perch, which poses a big threat to the fishery recruitment and sustainability (Gitonga, Nancy. 2013). Nile Perch factories,

processing and exporting the Nile Perch fillets, are the source of a large amount of Nile Perch waste (approximately 60 percent of the total catch weight). Waste, discarded by the factories, is smoked and dried (frames and heads) and is either sold locally or moved to the DRC. Many of the Nile Perch factories are working at less than 50 percent capacity due to the decline in stocks. Some have shut down altogether over the past few years as a result of over-fishing and poor management of the fishery.

Small-pelagic species are processed by traditional methods of sun-drying, which is a nature-dependent method and therefore highly ineffective during the rainy season. After landing, the fish is spread out on drying surfaces such as rocks, sand, and grass. There are also some other handling/processing methods whereby processors/traders take wet Dagaa and salt it before either smoking or frying it. Spoilage of harvested fish is common and partly caused by inadequate preservation methods and storage facilities. The shelf life of processed products is also shortened by inadequate packaging, which results in fragmentation of the product and loss of quality. Consequently, most products are processed for animal feed rather than for human consumption. For example, within the Lake Victoria Basin, 80 percent of the total Dagaa catch is transformed into animal feed and only 20 percent enters the direct human consumption value chain (LVFO. 2012).

IOC-SmartFish recently supported a study and analysis of the Lake Victoria Dagaa value chain, which included Tanzania (Legros, Damien, Luomba, Joseph. 2011). The objective of this study was to generate a better understanding of the marketing of Dagaa and its products from capture to consumption, with a view to generating a strategy for improving its marketing and regional trade. Major findings of the study indicated that the Dagaa fishery is still an artisanal activity. Both fishing and processing are still based on traditional methods that are not suitable for a responsible global market. Fish handling and processing are still far from the minimal hygienic standards.

The Dagaa value chain is rather complex and can have different structures. It is mostly an informal chain that involves many players. The value chain starts with fishers, continues with processors, traders, transporters, importers, retailers and ends with consumers. Some actors sometimes undertake two or even three of these activities and there can be several intermediaries involved in trading activities.

The final use of dried Dagaa can either be human food or animal feed. As it is now, it seems that a large majority of dried Dagaa goes into animal feed. However, the field mission revealed that the final destination of Dagaa can change both geographically and consumption wise. Despite the generally low quality of the dried product, it seems that the fish is reaching more and more distant markets in the region including the Republic of South Africa and Zimbabwe for instance. Zambia and Malawi are also recipients of a growing trade in such fish, but by far the largest regional market is DRC.

There is an evident lack of investment in fish handling and processing that is certainly due to a lack of training and market awareness of the players. Indeed, high quality Dagaa can fetch good prices on regional markets.

The study put forward a number of recommendations that could be implemented by the IOC-SmartFish Programme to enhance the fishery and regional trade. These include a global trade survey on small pelagic fish in the region with the constitution of a trade database, training in fish processing and handling practices, the organisation of potential investors' visits, the creation of a website that provides trade and marketing information on Dagaa and other fisheries products and the organisation of regional fish trade fairs (Legros, Damien, Luomba, Joseph. 2011)

On Lake Tanganyika, the trade of fish products on the Tanzanian side of the lake is centred around Kigoma. In addition to the catches of Tanzanian fishers in the part of the lake under Tanzania's jurisdiction, a significant amount of fish is also believed to be imported from Kalemie (DRC) and considerable volumes of fish are caught by Tanzanian fishers in the DRC's waters and landed in

Kigoma. In addition, fish products are transported to Kigoma from the central and southern areas of Tanzania (Mpanda, Nkasi) either by boat or via the improved lakeshore road. Products from Kigoma are either consumed locally or shipped to other urban areas in Tanzania such as Arusha and Dar es Salaam where higher prices are attained (Petit, Philippe. Shipton, Tom. 2012.).

Post-harvest activities, which include fish processing (drying, smoking, etc.) and trading at landing sites on Lake Tanganyika, are primarily undertaken by females. Women represent about 60 percent of total direct employment in the post-harvest sector, which is estimated at approximately 15,000 persons on the Tanzanian shoreline of the lake.

6. Aquaculture Sector

Mainland Tanzania

Aquaculture is still nascent in the Mainland. Current production was estimated at 3,000 to 5,000 MT of fish in 2012, mainly tilapia in freshwaters and milkfish (*Chanos chanos*) in marine waters. Aquaculture is mostly practiced by small-scale farmers in extensive systems. Farmers produce or collect their own seeds and there is no polyculture farming based on tilapia and clarias (De San, Michel. 2012). Small-scale fish farming is being widely practiced throughout the country, but mostly in the regions of Arusha, Mbeya, Iringa, Morogoro, Kilimanjaro, Ruvuma, Tanga, Coast, Dar es Salaam, Lindi and MTwara.

Other aquaculture activities include artisanal crab fattening, which is a nascent activity on the mainland. There is also an industrial shrimp farm on Mafia Island that produces about 350 MT of *P. monodon* per year. Feed is imported from Seychelles and Thailand and seeds are produced at the farm. Industrial cage fish farming on Lake Victoria is also starting to take off.

Aquaculture development on the mainland is managed by the Aquaculture Division of the Ministry of Livestock and Fisheries Development. There are three main training centres in the fisheries and aquaculture administration and the biggest one, Mbegani, is developing five satellite centres. The main research centres are the University of Dar Es Salaam, the University of Sokoine and the Tanzanian Fisheries Research Institute (TAFIRI).

Zanzibar

Aquaculture in Zanzibar is characterized by the success of seaweed farming, which is currently one of the most important economic activities for coastal residents (mostly women). Seaweed farming was introduced three decades ago, with *Euचेuma spinosum* and *Kappaphycus cottonii* being the two main seaweed species farmed. Today, there are about 23,000 seaweed farmers located in 93 villages. In 2012, the quantity of seaweed exported (in dry weight) was approximately 14,400 MT, for a total value of about US \$3.6 million. Several possibilities of improving value addition to the culture of seaweed exist, including modifying methods of culture, processing and marketing.

Other emerging mariculture activities are the culture of finfish, in particular milkfish (*Chanos chanos*) and mullet (*Mugil sp.*). The culture of pearls, oysters and crab fattening (*Scylla serrate*) are also being carried out in some coastal areas of Zanzibar.

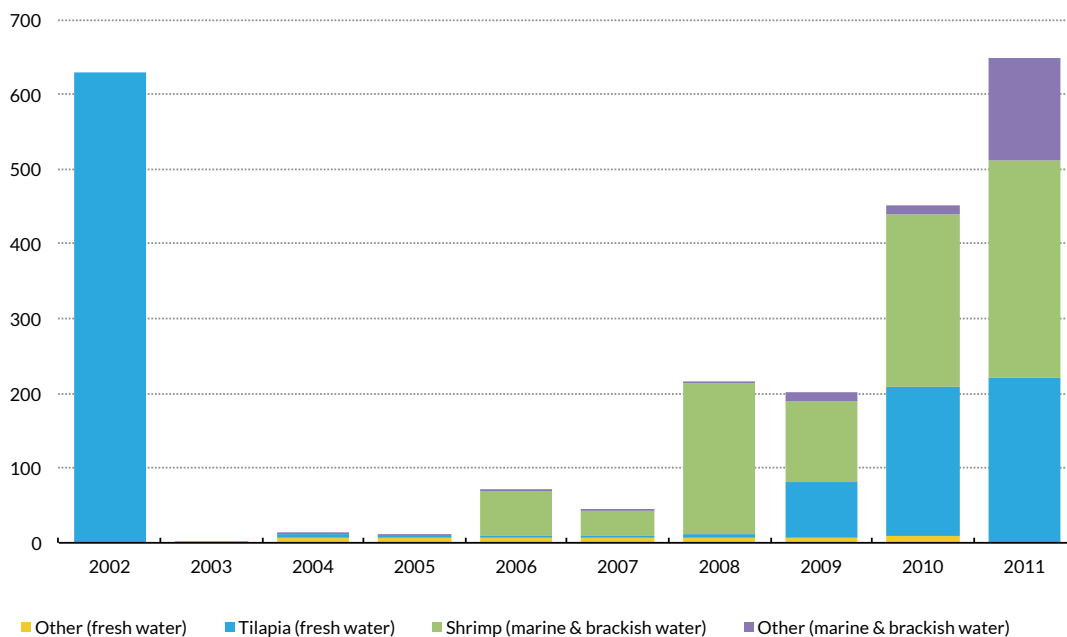
Aquaculture development in Zanzibar is the responsibility of the Department of Marine Resources of the Ministry of Livestock and Fisheries Development. The main research centre involved in aquaculture is the Institute of Marine Sciences (IMS) of the University of Dar Es Salaam. The Institute of Marine Sciences (IMS), in collaboration with Woods Hole Oceanographic Institution (on the US East coast, near Boston) and the State University of Zanzibar, is currently undertaking hatchery development trials.

On both the mainland and Zanzibar, there is a lack of policy documents that emphasise the assessment of all suitable/potential sites and zoning configurations that would avoid resource use conflict and environmental impacts, and that would further promote public-private partnerships.

Aquaculture production in Tanzania, excluding seaweed (in tons)



2014 -Figure 9 - Source FAO FISHTAT J (2002-2011)



Seaweed production in Tanzania (fresh equivalent weight)



2014 -Figure 10 - Source FAO FISHTAT J (2002-2011)



7. Fish Import and Export

Import

Fish imports are not significant in Tanzania due to the abundance of domestic supply particularly from inland fisheries. Approximately 5,000 MT (live weight) are imported per year, for a total value of about US \$4 million. The share of small pelagics in total fish imports significantly increased from an average of 26 percent for the period 2002-2005 to an average of 67 percent for the period 2006-2009 (FAO FishStat).

Export

Fish exports from Tanzania are considerable and mainly consist of frozen Nile Perch fillets, with the main markets being the EU and Asia. The total recorded value of fish exports from Tanzania was approximately US \$150 million in 2009.

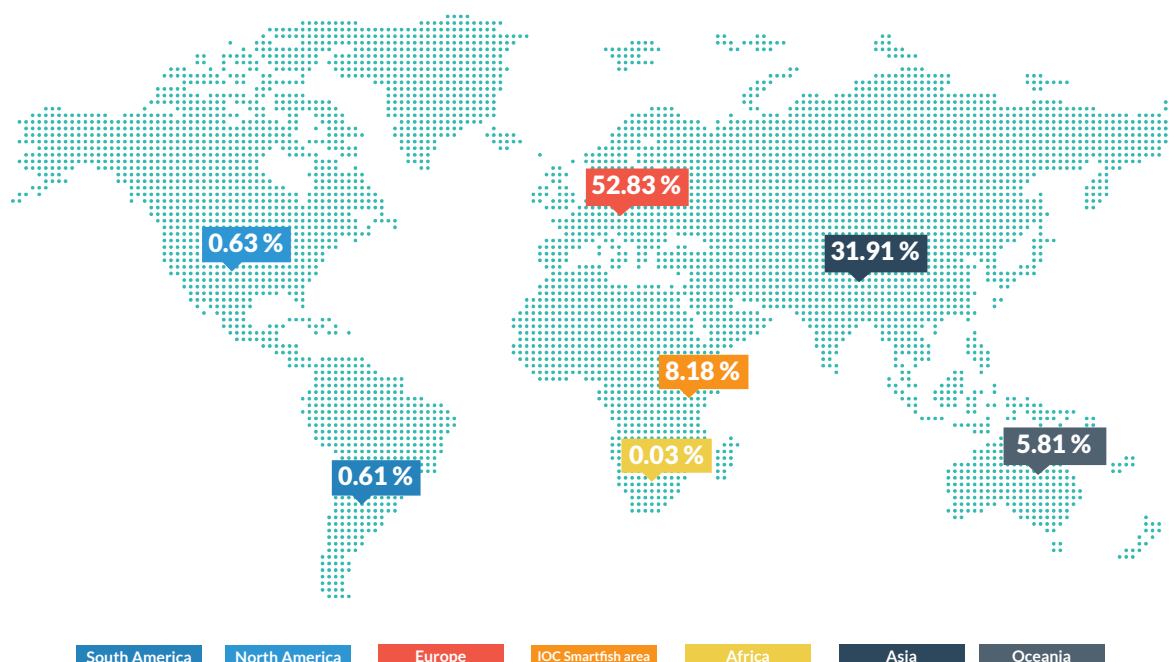
Regional exports (cross border trade) of fish from Tanzania are also significant, particularly from Lake Victoria. However, this trade is generally informal and data is not readily available or reliable. Tanzania could be the region's biggest exporter of freshwater sardine. Mahatane (*in* Hempel and Larsen, 2012) estimated that cross border trade amounted to 35,600 MT in 2008, of which 6,800 MT was Dagaa and 26,300 was fish maws. Such trade figures however are not captured in the FAO FishStat database.

Exports of marine fishery products are negligible when compared to exports of freshwater fishery products.

In Zanzibar, where some data is available, total exports of fishery products to Kenya, European countries and the United Arab Emirates in particular, was 424 MT in 2012, for a total value of about US \$340,000. In addition, exports of seaweed from aquaculture are steadily increasing, with a total value of approximately US \$3.6 million in 2012

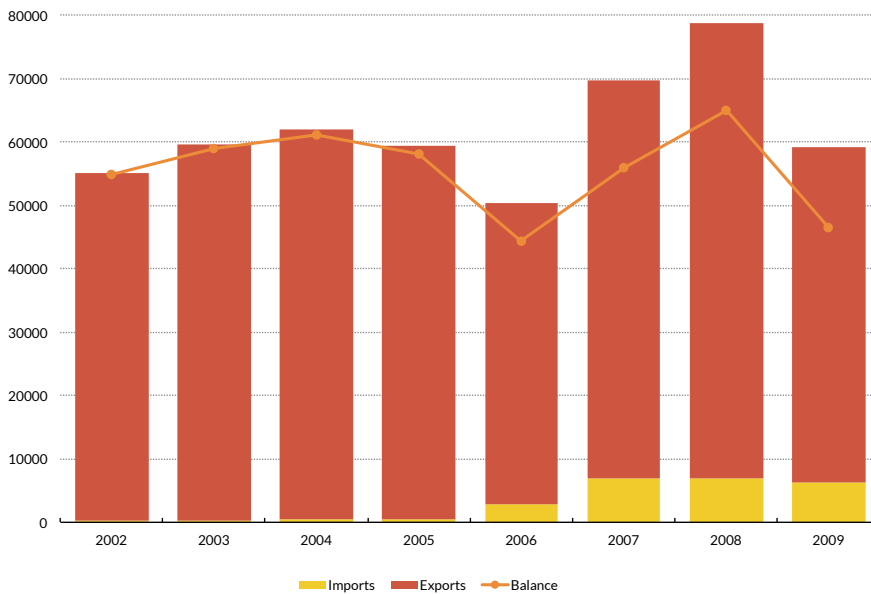
Destination of fish exports from Tanzania (% of \$)

2014 - Figure 11 - Source COMESA (ref year 2012) - *NES : not elsewhere specified



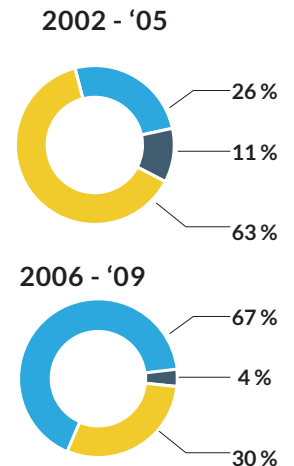
Fish trade balance in Tanzania in volume (in tons)

2014 - Figure 12 - Source FAO FISHTAT J (2002-2009)



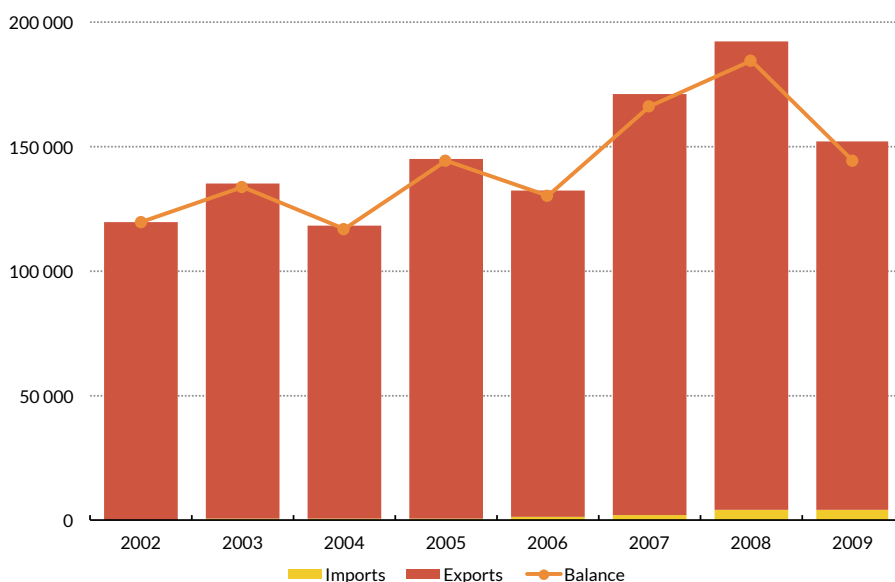
Fish Imports by category in Tanzania in value (% of \$)

2014 - Figure 14 - Source FAO FISHTAT J (2002-2009) - Average period



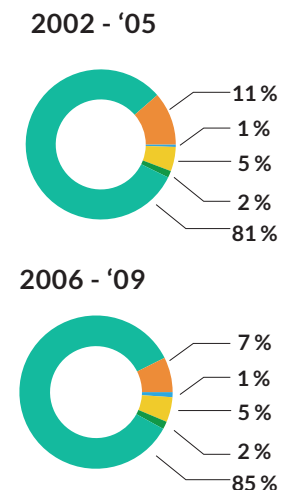
Fishtrade balance in Tanzania in value (in '000 US \$)

2014 - Figure 13 - Source FAO FISHTAT J (2002-2009)



Fish Exports by category in Tanzania in value (% of \$)

2014 - Figure 15 - Source FAO FISHTAT J (2002-2009) - Average period



SMALL PELAGIC	LARGE PELAGIC
OTHER	MOLLUSC-CRUSTACEAN
FRESH WATER FILLET FRESH, CHILLED OR FROZEN	OTHER ALGA



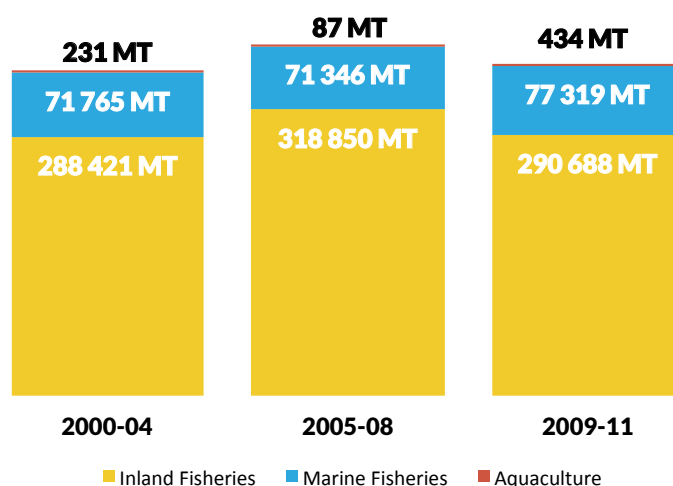
8. Contribution of the Fishery and Aquaculture Sector to the Economy

Total fish production in Tanzania, over the period 2002-2011, has been approximately 375,000 MT per year with inter-annual fluctuations that can be attributed to the vulnerability of fish stocks that are considered over-exploited and the variability of environmental factors that directly impact the productivity of the small pelagic fisheries, which form a significant share of the total catch. The production of seaweed, which has been close to 130,000 MT per year over the period 2009-2011, is not taken into consideration in Figure 14 below.

This estimate of total fish production might however be an underestimation given the weaknesses in data collection. It should also be noted that catches of tuna and tuna-like species by DWFN fleets in the Tanzania EEZ are close to 20,000 MT per year.

Total Domestic Fish production in volume in Tanzania, excluding seaweed (fisheries and aquaculture) (in tons)

2014 - Figure 16 - Source FAO Fishtat J (2000 -2011)



Fisheries account for about 3 percent of GDP, with the Nile Perch fisheries being the major contributor. It should be stressed that this ratio is much higher in Zanzibar where contribution of fisheries to regional GDP might be around 7 percent according to official data.

It is hard to assess the **contribution of fisheries to budget revenue** due to the lack of data. According to reports prepared in the context of the preparation of a regional World Bank project involving Tanzania (SWIOFish), the licensing of foreign tuna vessels has grown in recent years with licence fees worth over one million dollars.

The fisheries sector plays an important role in the national economy in terms of **contribution to the country's trade balance**. In 2011, 14 percent of total food and agricultural exports came from fishery products; whilst in terms of total exports, the share of these items was 7 percent (Kurien, John. López Ríos, Javier. 2013). As a net exporter, fishery products represented only 0.1 percent of total imports in 2011 (0.7 percent of food and agriculture imports).

Contribution of fisheries to employment can be understood through the number of people




directly involved in fishing activities, which is approximately 200,000 in Tanzania. A recent socio-economic study conducted in Zanzibar showed that fishing was found to be the most dominant economic activity in coastal communities (28.7 percent of the total respondents), followed by crop farming (24.2 percent) and seaweed farming (14.4 percent), whilst tourism and other activities jointly accounted for 32.6 percent.

Fish consumption in Tanzania is relatively low at 5.7 kg per capita, below the African average (9.4 kg). However, this estimation likely hides very uneven consumption behaviours. Consumption of fishery products is much higher in coastal regions and in Zanzibar (almost 20 kg per capita), as well as along the coasts of Lake Tanganyika and Lake Victoria. Around the lakes, species like Dagaa play a lead role in the fish diet of the local population.

According to FAO estimates, in 2009 fishery products accounted for 20.7 percent of the total animal protein intake in Tanzania, slightly above the African average (19.1 percent). The daily apparent consumption of fish protein however has shown a declining trend in the past decade as a result of an increasing population and a decreasing supply for local consumption.

Fish consumption in Tanzania (in live weight)

2014 - Figure 17 - Source FAO Fish and fishery product, world apparent consumption FAO STAT (2000 - 2009)

	 Total fish supply quantity	 Fish supply per capita	 Fish protein per capita
2008 - 09	231,650 MT	5.4 kg/y	2 g/day
2004 - 07	262,641 MT	6.675 kg/y	2.45 g/day
2000 - 03	271,361 MT	7.65 kg/y	2.8 g/day

According to national policy documents, the fishery and aquaculture sector is assessed as a key sector in national food security. However, fish consumption is falling, due to the development of the export sector, stagnant production and an increasing population. However, there is room for improvement of the role of fisheries in food security, but this would require the sector to be more involved in policy design.

Little information is available on the role of women in the fishery and aquaculture sector. Women are mostly engaged in fish processing and marketing activities. For instance, as mentioned earlier on Lake Tanganyika, the share of the women involved in the post-harvest sector is around 60 percent. Women are also dominant in the seaweed-farming sector.



POLICY, INSTITUTIONAL AND LEGAL FRAMEWORK OF RELEVANCE FOR THE FISHERY SECTOR

9. Fishery Policy and Planning

Mainland Tanzania

Until recently, the overall sectoral policy on the mainland used to be guided by the National Fisheries Sector Policy and Strategy Statement of 1997. A National Fisheries Policy (NFP) was prepared in 2010. The overall goal of the NFP is to promote the conservation, development and sustainable management of fisheries resources for the benefit of present and future generations. The policy requires the integration of conservation measures and sustainable use activities of the fisheries resources in socio-economic programmes of the communities. It encourages and supports initiatives leading to the protection and sustainable use of fisheries and aquatic resources and highlights the protection, productivity and biological diversity of coastal and aquatic ecosystems through prevention of habitat destruction, protection of fragile ecosystems, addressing pollution and over exploitation.

A Fisheries Sector Development Program (FSDP) was developed in 2011 to support the operationalization of the draft 2010 NFP. The overall goal of the FSDP is to develop a sustainable, competitive and more efficient fisheries and aquaculture industry that contributes to the improvement of stakeholder livelihoods and the national economy whilst preserving the environment. The specific objectives of the FSDP are to :

- Ensure effective fisheries resources management, protection and conservation;
- Strengthen fisheries and aquaculture products' utilization and marketing;
- Strengthen and support fisheries and aquaculture research, training, extension and information services;
- Develop and strengthen appropriate fisheries and aquaculture infrastructure; and
- Promote aquaculture development, management and environmental conservation.

Fishery policy in Zanzibar

The overall sectoral policy in Zanzibar has been guided by the Fisheries Policy of Zanzibar of 2000. This policy was set to promote, protect, develop and sustainably utilize fish and other living aquatic resources and to provide food, employment and foreign exchange earnings through the export of surplus fish and other fish products. Zanzibar fisheries administration has recently engaged in a revision of this policy with a view to updating the planning document and better address emerging issues such as adaptation to climate change, aquaculture development and post-harvest issues. The latter issue makes reference to the Zanzibar Agricultural Marketing Policy (ZAMP), 2012 which advocates concrete actions to improve the current situation in terms of fish quality, safety and availability, market and transport infrastructure, value addition and diversification of markets.

The major goals and key objectives of the draft policy, which are developed in 24 policy statements and strategies, include promoting the sustainable development of fisheries and strengthening existing systems, ensuring food safety and maximizing benefits for the community from marine resources, promoting the sustainable development of artisanal and deep sea fisheries, and promoting sustainable aquaculture development.



Furthermore, Zanzibar is currently developing a strategy for improved fisheries governance and management, with the support of the IOC-SmartFish Programme. During a workshop that was held in Pemba in November 2013, participants identified some priority issues that should be addressed in this strategy. These include: improving fisheries monitoring systems and information dissemination; developing adequate research systems to support fisheries management and governance; promoting the concept of Priority regulation for Strong Enforcement (PSE); promoting the participation of fishermen in fisheries management, including the delivery of some management services; strengthening the fisheries legislative and regulatory framework whilst emphasising the improved incorporation of good governance principles such as participation; and the capacity-building of institutions including improved information sharing to improve transparency in the management of the fishery sector and increased responsibility of institutions in terms of their capacity to fulfil their mandate.

Fishery policy in Tanzania EEZ

Under the Union arrangement, fisheries beyond the territorial seas fall under the joint management of the mainland and Zanzibar and for fisheries this arrangement became operational in February 2010 through the DSFA Act No.1 of 1998 as amended by the DSFA Act No.4, of 2007.

The DSFA's vision is to promote responsible fisheries that provide economic opportunities whilst ensuring the conservation of living marine resources and the protection of marine biodiversity by ensuring the long term conservation and sustainable use of living marine resources in the deep sea and preventing significant adverse impacts on vulnerable marine ecosystems. The DSFA is mostly concerned with tuna and tuna-like fisheries matters.

Others considerations

The mainland and Zanzibar have placed particular attention on the promotion of community-based institutions, namely Beach Management Units (BMUs) on the mainland and Village Fishing Committees (VFCs) in Zanzibar. Such local institutions are a core instrument for supporting collaborative mechanisms between the fisheries administration and fishing communities and decentralized institutions such as district authorities for the provision of some fisheries management services including data collection and surveillance.

It should also be noted that in 2012, Tanzania drafted a Tuna Fisheries Management Strategy, which is currently being finalised. The overall goal of the strategy is to promote the sustainable management and utilization of tuna and other highly migratory resources to optimize the biological, environmental, social and economic benefits for the Tanzanian people. The underlying goal of the strategy is to improve the management of the DWFN fleets operating in the EEZ including deterring IUU, increase value addition of the tuna catch and to promote the development of a domestic tuna fishing fleet.

Finally, it should be mentioned that Tanzania recently engaged in a dialogue with the EU to develop a Fisheries Partnership Agreement for the tuna fisheries.

10. Institutional Framework

10.1. Fisheries Administration

The split jurisdiction between the mainland, Zanzibar and the DSFA implies that there are three separate administrative structures for fisheries in Tanzania. In practice, improved coordination between the respective administrative structures is particularly necessary for the management of artisanal marine fisheries targeting shared stocks of small pelagics.

Government administration is conducted at both regional and district levels, with more functional powers at the district level under the current decentralised system. Under decentralization, the central government does not link directly with activities at the grass roots level. Rather, the government's role is to make policies and regulations, which are implemented indirectly through the District/Municipal Councils however, the supervisory role is still undertaken by the Regional Secretariat and the District Commissioner's Office.

Mainland Tanzania

The key fishery responsibilities on the mainland fall under the Ministry of Livestock and Fisheries Development. The fisheries administration is composed of the Fisheries Development Division (FDD), the Aquaculture Division and the Research Coordination, Training and Extension Services.

The FDD is responsible for fisheries management and administration as well as conservation. This entails, inter alia, formulation of policies and overseeing implementation; sectoral planning and budgeting; formulation and review of legislations; MCS; development of information systems; extension services; research and training; licensing; revenue collection; and international co-operation.

Field administration is linked to local government structures in line with decentralization. The main inland fisheries offices are located in Mwanza for Lake Victoria and Kigoma for Lake Tanganyika. There are thirteen coastal regions on the mainland. In practice, field administration is mainly dedicated to data collection, tax collection and legislation enforcement.

Zanzibar

The key fishery responsibilities in Zanzibar fall under Zanzibar's Ministry of Livestock and Fisheries. The fisheries administration is composed of the Department of Fisheries Development (DFD) and the Department of Marine Resources (DMR). The DFD is headed by a Director and is composed of four sections/units, namely: the Marine Conservation Unit (MCU), Artisanal Fisheries Development, Planning, Fisheries Industries Development, and MCS. The DMR is headed by a Director and is also composed of four sections: Seaweed Farming, Mariculture, Markets and Value Addition, and Planning. Each of the departments has a liaison office in Pemba. Field officers are present in all the five districts.

The mandate of the fisheries administration covers a large spectrum of fisheries governance and management functions including fisheries planning, the licensing of vessels, the licensing of fishermen, fisheries monitoring, fisheries research, legal aspects, promotion of Marine Protected Areas (MPAs), MCS, capacity-building of stakeholders, extension, promotion of post-harvest activities, quality control of fish and fishery products and aquaculture.

Tanzania EEZ

The DSFA was established through the Deep Sea Fishing Authority Act of 1998 to regulate deep sea fishing (and other uses) in the EEZ. The functions of this Authority are to: promote, regulate and control fishing in the EEZ; regulate the licensing of people and ships intending to fish in the EEZ; initiate, implement and ascertain the enforcement of policies on deep sea fishing vessels; formulate and coordinate programmes for scientific research in respect of fishing; formulate fisheries policies; negotiate and enter into any fishing or other contract, agreement or any kind of fishing cooperation with any government, international organisation or other institutions in pursuance of the provisions of the DSFA Act of 1998; and do or undertake any other act or thing required or permitted to be done in the furtherance of the purposes and provisions of the DFS Act of 1998..

10.2. Fisheries Research and Training

Fishery research in Tanzania mostly involves four institutions as follows:

- The Tanzania Fisheries Research Institute (TAFIRI), which is a semi-autonomous institution responsible for carrying out fisheries oriented research in marine, brackish and fresh water fisheries;
- The Department of Fisheries Sciences and Aquaculture of the University of Dar es Salaam;
- The Institute of Marine Sciences (based in Zanzibar) of the University of Dar es Salaam;
- The Department of Food Science and Technology of the Sokoine University of Agriculture.

Furthermore, the National Environment Management Council (NEMC), which is not directly linked to the fisheries sector, oversees all scientific environmental issues including those related to marine resources.

Most of Tanzania's research institutions have developed strong collaboration with both regional and international institutions such as SADC, SWIOFC, the IOTC and NGOs such as the WWF and IUCN.

Fisheries training

Two main institutions provide training services and support to the fisheries sector: the Mbegani Fisheries Development Centre (Bagamoyo), and the Mwanza Fisheries Development Centre. Both Centres deliver certificates and diplomas in fishing and related activities.

A third training institution has also recently started up activities: the Kigoma Fisheries Development Centre.

10.3. Private and Community-Based Institutions

Community-based organisations

Beach Management Units (BMUs) on the mainland and Fishing Village Committees (FVCs) in Zanzibar are the backbone of fisheries co-management in Tanzania. These empower local fishers to monitor and take responsibility for their local resource management and development.

The promotion of BMUs and FVCs should be put in parallel with the overall decentralisation process in the country. The devolution of responsibilities (and rights) to districts and ultimately to communities through the BMUs and FVCs has many advantages, however, it is evident that the performance of decentralisation has so far been sub-optimal due to two inter-related reasons: the lack of financial resources and a shortage of human capacity (Anderson, Jim. 2011).

BMUs were first developed on Lake Victoria following a fisheries co-management initiative established in the late 1990's. BMUs have a role in monitoring and controlling practices such as environmental damage, cross border conflicts and illegal or damaging gear. They also carry out the registration of boat owners and fishers and implement by-laws. BMUs, however, require substantial support if they are to successfully implement their role as envisaged by the fisheries legislation (Anderson, Jim. 2011). There are an estimated 511 BMUs in the three districts of Tanzania adjacent to Lake Victoria (Mwanza, Mara and Kagera). On Lake Tanganyika, whilst there are 239 landing sites along the Tanzanian shoreline, there are only 22 BMUs in operation (Petit, Philippe, Shipton, Tom. 2012).

It should also be noted that on the mainland, according to the Fisheries Act No. 22 of 2003, every fishing community, in collaboration with the village government, should form a BMU for the purpose

of conserving fisheries resources and every artisanal fisher should be a member of the BMU to have the right to apply for a fishing licence. There is no similar provision in the Zanzibar Fisheries Act of 2010 with regard to FVCs.

Producer's organisations

There are no artisanal fishers associations on the Mainland or in Zanzibar. On the other hand, there is a Trawler Operators Association (TOA), even if the industrial prawn fishery has been closed since 2007.

There are two associations representing the interests of industrial processors and exporters, namely: the Tanzania Industrial Fish Processing Association (TIFPA) and the Fish Processing Organization (FPO). TIFPA has been closely involved with Nile Perch and lake fisheries interests, and is actively participating to initiatives aimed at deterring the trade of under-sized species.

The recent creation of a seaweed farmers' association in Zanzibar should also be noted.

11. Legal Framework

11.1. Fisheries Legislation

There are five main pieces of fisheries' legislation in Tanzania (Snijman, Phil. 2011.). The Fisheries Act of 2003 is the main piece of fisheries legislation for the mainland, and the Fisheries Act of 2010 is the main piece of legislation that governs fisheries in Zanzibar. There are two pieces of legislation that cover the entire United Republic of Tanzania and are therefore applicable to both sides of the union; these are namely the Territorial Sea and EEZ Act of 1989 and the DSFA Act of 1998 (note that this Act has undergone amendments by the DSFA (Amendment) Act of 2007). The former Act declares the EEZ of the United Republic of Tanzania whilst the latter establishes the DSFA. These Acts are intended to assist Tanzania with regulating fishing activities in the territorial sea and the EEZ.

Mainland Tanzania

Fisheries management on the mainland is governed by the Fisheries Act of 2003 and associated Fisheries Regulations of 2009. The Fisheries Act broadly outlines the overarching framework with which to regulate the sector. The Fisheries Regulations are more specific and identify permit requirements and other sector-specific basic regulations to control fishing, processing and trading operations.

Recent reviews of the Fisheries Act of 2003 by legal specialists highlighted the need for a revision and update (Snijman, Phil. 2011). In particular, the Act focuses more on managing the fishing industry and promoting development and investment than managing the resources. Good governance principles such as participation and transparency are insufficiently addressed. There are also some weaknesses regarding provisions related to MCS, including the weak correlation between the definition of MCS personnel and the use of the term in the text, the absence of provisions for the jurisdiction of the Court and a lack of clarity of the compounding procedures.

Zanzibar

The Zanzibar Fisheries Act of 2010 repealed the Fisheries Act of 1988. The new Act introduces stronger provisions for the management and development of fisheries in the internal and territorial waters of Zanzibar. The obligation for any fishing craft/vessel to be licensed constitutes a major improvement with regard to management of fishing capacity and the possibility to establish different

categories of licences for fishers. The Act also provides a list of prohibited fishing gears and methods that are particularly damaging to the fishery resources and the coastal marine environment, as well as a list of technical restrictions for the use of certain gear in MPAs. A fisheries management plan (FMP) can also be developed under the new Act.

The Fisheries Act of 2010 constitutes a major improvement when compared with the Fisheries Act of 1988 with regard to fisheries management. However, some good governance principles are insufficiently developed such as participation and transparency: one of the key challenges of the Act being the high degree of discretionary power granted to authorities under the fisheries legislation and a lack of provisions for processes of stakeholder involvement or consultation in decision-making.

Tanzania EEZ

The Deep Sea Fishing Authority Act of 1998, as amended in 2007, and the Deep Sea Fishing Authority Regulations of 2009, should be revised and strengthened with regard to additional provisions required to be able to effectively implement the IOTC resolutions and other regional agreements and obligations (Snijman, Phil. 2011).

In particular, Kavia Yona, 2011, emphasized that the DSFA (2007) lacks strong and explicit provisions on the need to initiate plans for implementing international agreements. The Act does not include a collaborative system on how the authority collaborates with other institutions to implement MCS, and furthermore, officers of the institutions mentioned under the Act are not recognized under the Act as “Authorized Officers”. This can have a direct or indirect influence on the management of fisheries resources. The DSFA lacks provisions on enforcement, and it is important that these provisions are included to ensure that offenders do not escape because of a lack of legal basis for pursuing individuals beyond national jurisdiction. Also, there are no specific or clear provisions for MCS.

11.2. Other Elements in relation to Legal Aspects

Participation in Regional Fishery Bodies

Tanzania is a member of the Indian Ocean Tuna Commission (IOTC), the Southwest Indian Ocean Fisheries Commission (SWIOFC), the Committee for Inland Fisheries and Aquaculture of Africa (CIFFA), the Lake Victoria Fisheries Organization, (LVFO), and the Lake Tanganyika Authority (LTA).

The IOTC is an intergovernmental organisation mandated to manage tuna and tuna-like species in the Indian Ocean and adjacent seas. Its objective is to promote cooperation amongst its members with a view to ensuring, through appropriate management, the conservation and optimum utilization of stocks and encouraging the sustainable development of fisheries based on such stocks.

The SWIOFC was established in 2004 by a Resolution of the FAO Council as an Article VI FAO Regional Fishery Body. The SWIOFC is an advisory body with a mandate to promote the sustainable development and utilization of coastal fishery resources off the shores of East Africa and several island states of the region, as well as responsible management and regional cooperation on fisheries policy. The SWIOFC does not have a mandate in relation to areas beyond national jurisdiction.

The CIFFA was established by the FAO Council in 1971 as an Article VI FAO Regional Fishery Body. CIFFA is an advisory body with a mandate to promote the development of inland fisheries and aquaculture in Africa.

The LVFO was established by a Convention signed on 30 June 1994 by Kenya, Tanzania and Uganda sharing Lake Victoria. The LVFO is registered under Article 102 of the United Nations Charter and recognized as a Regional Fisheries Management Organisation (RFMO). The organisation is an institution of the East African Community (EAC). Its objectives are to foster cooperation amongst the contracting parties, harmonize national measures for the sustainable utilization of the living resources of Lake Victoria and to develop and adopt conservation and management measures.

The LTA was established in December 2008 to implement the Convention on the Sustainable Management of Lake Tanganyika, and by doing so, provide the overarching management structure for the Lake system. The overall objective of the Convention is to ensure the protection and conservation of the biological diversity of the lake and its basin, and to promote the sustainable utilization of natural resources. The LTA comprises a Conference of Ministers, a Management Committee and a Secretariat. To achieve the overall objective of the Convention, a Strategic Action Program for the Protection of Biodiversity and Sustainable Management (SAP, 2000) was developed and endorsed by the four riparian countries (Petit, Philippe. Shipton, Tom. 2012).

Fishing Agreement

As mentioned above, Tanzania recently entered into a dialogue with the EU to develop a Fisheries Partnership Agreement on tuna fisheries.



FOCUS ON FISHERIES MANAGEMENT AND RELATED ISSUES IN THE MARINE SECTOR

12. Administrative Functions

Fleet registration and fishing licences in the artisanal sub-sector

On the mainland, according to the Fisheries Act of 2003, all fishing vessels are required to be licensed, as is every fisher. Furthermore, any artisanal fisher who is not a member of a BMU shall not be issued with a license for fishing. The Fisheries Regulation of 2009 even requires a pre-inspection of artisanal fishing vessels prior to licensing (Anderson, Jim. 2011).

The licensing of both fishing craft and fishers is undertaken at the district level. The central fisheries administration, in Dar es Salaam, manages a registry based on information collected from DFOs. However, information exchange between districts and the central fisheries administration is weak and data is rarely available in an electronic format.

In Zanzibar, the licensing of fishing craft and of fishers is also obligatory. Licensing should be managed under the Planning Section of the DFD, but licences are actually issued at the district level through DFOs. In practice, only the licensing of fishing craft is implemented and even then, only partially. Statistics of craft compliance indicate that about 50 percent are licensed in the Stone Town area. In most of the other districts, only about 5 percent of craft are licensed.

The DFD, through its Planning Section, should manage a register on both fishing craft and fishing licences. Such a register is currently not operational.

Fleet registration and fishing licences in the Tanzania EEZ

The DSFA does not have a formal separate registration of vessels; rather the relevant data is recorded in applications for a DSFA licence to fish in the Tanzania EEZ. The licensing conditions for fishing in the EEZ are spelt out in the DSFA Regulations of 2009. Vessels wishing to operate in the EEZ do however require an IOTC vessel registration number. DSFA-licensed vessels generally do not make a port visit to collect their licence (in particular because of piracy issues), which prevents any verification of the licence application data. And it was reported that vessels change their name relatively frequently, which can reduce the capacity of the DSFA to monitor and track vessels that may be engaged in IUU fishing (Anderson, Jim. 2011).

The Zanzibar Maritime Authority (ZMA) also maintains a registry of vessels. Collaboration with the DSFA is weak, although the ZMA should not register a fishing vessel without the approval of the DSFA to prevent the registration of possible IUU vessels. However, it was reported that some foreign fishing vessels are registered in Zanzibar that do not possess a valid fishing licence from the DSFA (Anderson, Jim. 2011).

13. Fisheries Monitoring

Artisanal fisheries

Fisheries monitoring for both the mainland and Zanzibar relies on regular frame surveys (FS) and on the routine collection of fisheries data through sample surveys, to generate overall production figures. The last two FS for the mainland and Zanzibar were conducted in 2007 and 2009 and in 2007 and 2010 respectively. The 2007 Frame Surveys for the mainland and Zanzibar were conducted in



parallel, whereas the other two were conducted separately with the risk of having statistical biases due to the migratory behaviour of some fishing units and fishers.

Data on fisheries are routinely collected by beach recorders. A typical profile for a fishing trip is the catch (landings) and the fishing effort (e.g. number hours fished or duration of the entire trip, number of gear used, number of crew, etc.). Economic data are also included in the data profile in the form of the value of the landings for each category of commercial fish species. The data collection protocol is for a 100 percent census of catch (landings) and effort on a daily basis for 16-days per month. Data are then collected and compiled by DFOs and sent to the statistics service of the central fisheries administration for further processing. Processing of data includes the application of raising factors to generate an estimate for an entire district based on the assumption that fishing would take place every day of every month.

Anderson, 2011, analysed the fisheries monitoring systems for both the mainland and Zanzibar. Based on his findings, it appears that the data raising procedure is extremely cumbersome and likely contains high levels of error as data are processed manually on a number of iterations to arrive at a final figure. There is also limited detail captured by the data in terms of species composition and it is highly likely that the complete enumeration does not meet the quality of data that is expected. Finally, the statistics that are available at the central fisheries administrations do not allow for the monitoring of fish catch by major fishing techniques and overall fishing effort exerted and/or by main fishing techniques, although beach recorders enumerate such raw data. The system therefore cannot capture the ecological complexity of the fisheries, which are multi-gear and multispecies and hence it cannot effectively support decision-making for fisheries management

De Graaf (2013) confirmed that the reporting system significantly affects the overall statistical system. He also stressed that going from a paper based system to a digital system at the district level using a real database would solve major problems and that there would be a need for some redesign of the overall system.

Other weaknesses of the current fisheries monitoring system include the poor working conditions of beach recorders and the weak participation of BMUs and VFCs whose representatives are volunteers.

Fisheries in Tanzania EEZ

The DSFA Regulations specify a number of reporting requirements for vessels licensed to fish in the EEZ. These include VMS and a formal Daily Fishing Logbook. However, the monitoring system of DWFN tuna vessels operating in the Tanzania EEZ is weak for several due to various technical reasons (only a small amount of fish is landed in Tanzania, few vessels report using VMS due to the threat of piracy in Tanzania's coastal waters) and a lack of collaborative mechanisms with Kenya.

14. Fisheries Management Systems in the Artisanal sub-sector

Conventional system

The artisanal fisheries on both the mainland and Zanzibar operate under an open access regime. Every national citizen has the right to fish provided they fulfil the minimum conditions (fishing craft licence and/or fishing licence). Besides the poor level of compliance of fishers with regard to licensing, the open access regime is believed to have contributed significantly to the general trend of increased fishing capacity and effort in the inshore zones and the likely depletion of many coral reef fish species.

Existing regulations, if properly enforced, would significantly improve the situation in terms

of mitigating the risk of a fish stock collapse and environmental degradation. These include the prohibition of damaging fishing techniques and methods (e.g. dynamite fishing, beach seining, use of poison, use of monofilament nets, etc.) and various size limitations (mesh-size of some nets, minimum size of fish species, etc.). However, due to weak MCS and poor enforcement mechanisms, the occurrence of illicit fishing activities is high.

The fisheries administration has encouraged, with the assistance of projects such as the past MACEMP World Bank project, various forms of participation in fisheries management through the establishment of BMUs and FVCs in all fishing villages along the coast. The efficiency and sustainability of such mechanisms has proved however to be questionable, and there is still a need of capacity building and improved legitimacy of such community-based organizations within fishing communities.

The legal basis to support participation in fisheries management is also weak, in particular in Zanzibar where no legal provisions related to FVCs have been made so far. It should also be noted that on both the mainland and Zanzibar, fisheries legislation provides strong discretionary power for the ministers in charge of fisheries to adopt fishing regulations and formulate management arrangements such as fisheries management plans.

Some forms of traditional management practices can also be observed on both the mainland and Zanzibar, which include closed seasons and closed areas at the local level.

Fisheries Management Plan (FMP)

The mainland has developed two FMPs. One refers to octopus fisheries was prepared with the support of the WWF in relation to MSC guidance. The other refers to small pelagic fisheries and was supported by the FAO EAF Nansen project. It should be noted that the small pelagics FMP only concerns the territorial waters of the mainland whereas fisheries are shared with Zanzibar and most fishing effort is exerted in the internal waters.

No FMP has been developed for Zanzibar so far.

Marine Protected Areas

The concept of MPAs as a tool for fisheries management has been particularly promoted in Zanzibar. Three MPAs have been formally established in Zanzibar: the Menai Bay Conservation Area (MBCA) created in 1997, the Mnemba Island-Chakwa Bay Marine Conservation Area (MIMCA) created in 2002, and the Pemba Channel Conservation Area (PECCA) created in 2005. Two other MCAs are under creation on Unguja Island: Changuu-Bawe Marine Conservation Area (CHABAMCA) and Tumbatu Marine Conservation Area (TUMCA).

The major difference inside the MPAs, apart from the fact that specific regulations are in force through specific Orders, is that both public institutions and community-based organisations (FVCs) seem to be in a better position to adequately fulfil their mandates in terms of ensuring the monitoring, control and surveillance of the coral reef fisheries and supporting local initiatives aimed at diversifying the livelihoods of fishing communities with a view to reducing fishing pressure on inshore stocks. This enabling environment has been further facilitated by NGO initiatives and more recently by government projects including MACEMP.

Furthermore, each of the three established MPAs has developed draft General Management Plans (GMPs), with the assistance of the MACEMP project. The GMPs will however become official documents when some enabling regulations of the Fisheries Act of 2010, including the Marine Conservation Unit Regulations, are adopted.

15. Fisheries Control, Surveillance and Enforcement

MCS for the mainland and Zanzibar is limited to the 12-nautical mile territorial waters, with the DSFA being responsible for MCS in the Tanzania EEZ.

Mainland Tanzania

The Ministry of Livestock and Fisheries Development on the mainland carries out MCS operations through the Directorate of Fisheries Resource Protection (DFRP). Five MCS zones have been identified for the mainland (Tanga, Dar es Salaam, Mafia, Kilwa and MTwara). Districts Councils have the legal mandate to manage natural resources. Each MCS zone has a Zonal MCS Officer reporting to the central fisheries administration, whilst the DFO reports to the District Executive Director. MCS means, including patrol boats, are managed locally, that is to say by the District Councils.

In terms of MCS patrolling, the MACEMP has been instrumental in increasing the capacity of the fisheries administration to get into the field through the provision of a number of patrol vessels of varying capacities. The largest of these vessels are 12 m LOA with twin 300HP inboard motors, a capacity of 1,200 lt of fuel, berths for 4 personnel and the capacity to take 10 personnel on daily MCS patrols (Anderson, Jim. 2011).

Meanwhile, the efforts of the fisheries administration for the mainland are focused on inland fisheries due to the importance of this sector. Office space, computers and internet facilities are adequate in Dar es Salam, but are limited in the districts. Transport and fuel supplies are severely limited and are a critical constraint to operations. Moreover, there are too few fisheries inspectors and limited human capacity to perform fisheries intelligence work as well as to apply risk assessments to MCS operations (Per Erik Bergh. 2012).

Zanzibar

The Ministry of Livestock and Fisheries carries out MCS operations through the MCS Section of its Department of Fisheries Development. The main work of the MCS Section is reported to be patrolling at sea including the rescue of artisanal fishers as well as the training of fishers on life-saving/rescue. Apart from the main office situated at Maruhubi, MCS also relies on 5 bases, of which 4 are located in Unguja and 1 in Pemba. Logistical means at sea used for MCS include 12 patrol boats that are based in the MPAs, of which 3 are high-speed boats and the rest are moderate and low-speed boats. Motorcycles and cars are used for land patrols.

The MCS Section of the DFD has successfully developed some coordination with other institutions working at sea such as the DSFA and the Zanzibar Navy (KMKM). Collaborative mechanisms also exist between the MCS Section and legal bodies such as the police and the judiciary system including prosecution.

Anderson, 2011, noted that there used to be a database designed for the management of MCS intelligence information but the system was lost. There is a need to improve internal communication within the Fisheries Department through intranet and other IT tools, as well as to improve safety at sea and communications when patrol boats operate as far as 10-12 nm offshore and when local transgressions by DFWN tuna vessels are reported to them.

Bergh, 2012, also highlighted the weak planning of MCS operations and insufficient awareness activities on the negative impact of illicit practices with reference to voluntary compliance.

MCS in Zanzibar at the time of the MACEMP was satisfactory in MPAs due to the availability of funds to support operational aspects of MCS (including fuel for patrol boats). The current situation is however much more problematic in all of Zanzibar's marine waters, and the occurrence of IUU

fishing, particularly in coral reef areas, is substantial.

Tanzania EEZ

The DSFA based in Zanzibar is responsible for all MCS activities concerning the pelagic (mainly tuna) fishery in the EEZ. MCS in the Tanzania EEZ has significantly improved since the last decade, notably thanks to the creation of the DSFA. Meanwhile, there are still some gaps and weaknesses in the current MCS, as underline by Bergh (2012). These include the following:

- There is no on-board observer programme, which constitutes a serious constraint for the verification of catches in the Tanzania EEZ, in a context where very few vessels land their catch in Tanzania;
- Port State Measures, in terms of operational procedures, are yet to be developed, in a context where very few foreign vessels call to port in Tanzania;
- There is very limited knowledge in relation to the tuna fishery in terms of catches, fishing patterns or trade. In addition, one expects a potentially high number of unlicensed vessels operating within the Tanzania EEZ as well as significant amounts of unreported fish being transhipped at sea from both licensed and unlicensed vessels;
- MCS intelligence information that could be used to investigate crime and support MCS planning is poor. Recent arrests and observations indicate that a significant unlicensed fishery is taking place within the Tanzania EEZ however, it is impossible to give any estimate of the magnitude of such a fleet;
- An early draft of a national plan of action on IUU fishing has been developed but is still being finalised.

16. Major Issues relating to IUU Fishing

On the mainland, dynamite fishing is the most acute form of IUU fishing. Persistence of beach seining and a high level of unregistered fishing craft (it was observed that 73 percent of all fishing crafts were not registered during the 2009 Frame Survey) are two other major issues that concern IUU fishing.

The phenomenon of dynamite fishing was a major problem in the 1990s in MTwara and Tanga regions but was more or less successfully countered in MTwara thanks to an aggressive response from the authorities. However, in the last few years the problem has once again resurfaced and metastasized in other areas including Dar es Salaam, in spite of numerous initiatives (Anderson, Jim, 2011).

Another fishing technique that deserves a specific mention is the use of the ring-net. This fishing technique is poorly regulated in inshore zones and is believed to negatively impact local fisheries management initiatives because of its highly migratory nature.

In Zanzibar, apart from the fact that measures relating to the licensing of fishing crafts are inadequately enforced and the bulk of fishermen do not comply with fishing licence obligations, the main illegal fishing activities are reported to be the use of small mesh size nets, non-compliance with zoning measures in MPAs, and the use of small-meshed dragnets, beach seines and spear guns in sensitive coral reef areas.

In the Tanzania EEZ, the main IUU fishing problems include incursions of non-licensed Asian and European tuna fleets into the Tanzania EEZ.



FOCUS ON FISHERIES MANAGEMENT AND RELATED ISSUES ON INLAND FISHERIES

17. Administrative Functions

Regulations call for fishing crafts to be registered and licensed, and for this information to be maintained in appropriate registers. Whilst the central fisheries administration is expected to keep registers of fishing craft, the incidence of unregistered vessels is high in the inland fisheries. On Lake Tanganyika, according to the 2011 Frame Survey, 78 percent of vessels were unregistered. There is no (annually updated) vessel registration or licence database available for Tanzania's Lake Victoria waters, with the exception of the LVFO EA-Fish Frame Survey Database.

Regulations even require a pre-inspection of artisanal fishing craft prior to licensing, but this measure is not enforced. If it were, it would be a useful complement to the Frame Surveys (Anderson, Jim. 2011). In addition, the marking of fishing craft is not done which is contradictory with the regulations (Petit, Philippe. Shipton, Tom. 2012).

Entry into the lake fisheries requires the payment of a licence fee. Fishing licences are issued at the district level. However, there are no fishing effort or quota controls, and thus the fishery is essentially open access.

According to regulations, BMUs are expected to 'participate in selection processes for the issuance of fishing vessel licences and fishing with the BMU jurisdictional area to ensure equitable access to resources.' This is a fairly substantial responsibility and one that is largely not applied in the BMUs of Tanzania (Anderson, Jim. 2011).

18. Fisheries Monitoring

Coordinated frame surveys on Lake Victoria and Lake Tanganyika fisheries are conducted on a regular basis through the LVFO and LTA respectively. Frame survey data is entered and checked at the national level before being submitted to regional fishery bodies. Such frame surveys attempt to capture data for all types of fishing gears, including those that are technically illegal (such as beach seines), and contribute significantly to fisheries monitoring on the great lakes.

Catch assessment surveys should be undertaken by representatives of the BMUs, with data generated sent to the DFOs who then transcribe the paper form into Excel spreadsheets. However, there is no effective data collection by BMUs currently underway on lake fisheries, even on Lake Victoria. An explanation given for this situation on Lake Victoria was that BMUs were previously being paid through the LVFO IFMP to carry out this task but when that programme finished, financial resources dried up and so the BMUs stopped collecting data. Another reason is that the responsibilities of BMUs, with regard to data collection, appear to be a little ambiguous (Anderson, Jim. 2011).

On Lake Victoria, other sources of information on fisheries can be derived from the TAFIRI station based in Mwanza, which is the national body responsible for implementing fisheries research as well as the focal point for LVFO's CAS programme.

19. Fisheries Management Systems



Fisheries management on Lake Victoria is mostly influenced by the LVFO. The objectives of the LVFO include the development and adoption of conservation and management measures. In this context, the LVFO provides management support and programme coordination across the three riparian countries and recommendations for Lake Victoria are similar across all three countries (Anderson, Jim. 2011).

A series of policy documents and management measures have been drawn up with a view to reversing the lake's fish stocks decline in recent years: the Regional Plan of Action on IUU Fishing (RPOA-IUU) in 2004; a Fisheries Management Plan for Lake Victoria 2009 – 2014 in 2008; a Regional Plan of Action on Management of Fishing Capacity (RPOA-Fishing Capacity) in 2007; the Nile Perch Fishery Management Plan for Lake Victoria 2009 –2014 in 2009 (Snijman, Phil. 2011). The most recent and conspicuous of these measures is the 'self-monitoring and control' initiative led by East Africa Industrial Fishing and Fish Processing Association (EAIFFPA), which applies in the three riparian countries (Gitonga, Nancy. 2013). This initiative consists of applying a zero-tolerance compliance policy of the harvested Nile Perch if not less than 50 cm total length.

The LVFO also has developed a MCS strategy (see below) and Technical Committees of the LVFO have been strengthened in recent years through the participation of stakeholder representatives, through the Regional Beach Management Unit network chair for the fishers, and the EAIFFPA for the industry.

Fishing regulations on Lake Victoria that are applied in all three countries include minimum mesh-size, maximum length of certain gear, minimum size of species and prohibition of certain gears and methods including trawling, beach seines, monofilament nets, cast nets, drifts nets and the use of chemicals and explosives.

At the same time, Lake Victoria has remained an open access fishery and fishing capacity and effort is steadily increasing in each of the countries including Tanzania, in spite of the fact that the RPOA-Fishing Capacity includes measures aimed at controlling fishing effort through licensing and limitations on the number of fishermen.

BMUs are also mandated to promote, in close consultation with fisheries officers, a co-management plan for a given area. Co-management plans can include closed seasons, restrictions on the type of fishing gear used and limitations on the number of fishing units. Such co-management plans however, still need to be developed.

On Lake Victoria, whilst fishing gears are not registered or marked, the definition of illegal gears is clearly stated, species restrictions are clearly defined and closed areas clearly demarcated in the regulations (Petit, Philippe. Shipton, Tom. 2012). The sale and importation of illegal fishing gear is also an offence, as is the unregulated export and import of fishery products.

20. Fisheries Control, Surveillance and Enforcement

Lake Victoria

On Lake Victoria, the LVFO MCS Strategy identifies the main threats to sustainability from illegal activity as follows: use of illegal gears such as beach seines, monofilament nets and undersized gill nets; capture, transport and processing of immature fish; fishing in restricted areas; and, fishing without the necessary permits.

The LVFO has a MCS-RWG (Regional Working Group) that meets to discuss MCS interventions including patrol planning. The MCS-RWG work designed the MCS Standard Operating Procedures (SOPs), which clearly underlines the rules of engagement (ROE), patrol mission standards, harmonization of data collection and the handling of suspects, etc. (Kariuki, Johnson. 2012).

Regional MCS initiatives are however confronted with financial constraints, with regard to regional patrols in particular, and with insufficient political will to support such initiatives. Corruption is also seen as a major factor affecting the effectiveness of the MCS system. It should be noted that there are three regional MCS sub-units based in Mwanza, Bukoba and Musoma on the Tanzanian side of the lake.

Gitonga, ACP Fish II, 2013, listed the main reasons for poor MCS and various solutions for improved MCS as suggested by stakeholders. These included inter alia, the need to promote the establishment of centralized auction centres to avoid a fragmented distribution chain which creates space for corruption in the fishing and marketing of immature fish at the local level, the need for political and administrative reforms of the LFVO to improve its effectiveness in fisheries management and MCS, the need to strengthen MCS activities through improved financing and the need to set up a Regional Fisheries Taskforce (RTF).

Furthermore, in theory BMUs should be closely involved in MCS on a voluntary basis. Barriers towards voluntary compliance are however complex for a number of reasons including social considerations, conflict of interest, corruption, political interference, lack of support from government departments (fisheries, police, etc.), security issues and safety risks of MCS operations (Kariuki, Johnson. 2012).

It should also be noted that IOC-SmartFish organized a joint operational training on MCS on Lake Victoria in February 2013, with participants from each of the LFVO states. Reports from country representatives indicated that significant quantities of illegal gears (about 50 MT) and fish and fishery products (1.5 MT) were seized during the training intervention. Participants also included staff from the marine forces of Kenya and Tanzania.

Lake Tanganyika

On Lake Tanganyika, regional cooperation is less developed than on Lake Victoria due to the youth of the LTA.

In 2004, a Doria Surveillance and Patrol Unit was developed by the mainland fisheries administration as a component of the National Surveillance Unit (NSU) that is based in Mbegani (near Dar es Salaam). The Doria Unit, which is based in Kigoma, is responsible for undertaking MCS activities on Lake Tanganyika and the rivers and lake systems of Western Tanzania.

At present the Doria Unit has only one vessel available for MCS activities with operations restricted to the Kigoma area. Compliance activities in the southern districts are currently undertaken in collaboration with the army. The Doria Unit and the police often undertake joint patrols. The police patrols are primarily focused on reducing the incidence of theft and piracy on the lake, whilst the Doria Unit is more focused on illegal fishing activities, gears and vessels. It should also be noted that the LTA is in the process of constructing compliance offices in the southern districts and equipping each district with a compliance vessel.

An evaluation of the MCS system on Lake Tanganyika was carried out with the support of the IOC-SmartFish programme in 2012. In terms of human resources, the main findings from the evaluation of the MCS capability in Tanzania were as follows:

- As a whole the Fisheries Department on the lake has a staff of 44, over half of whom are based in Kigoma. The Doria Unit has six personnel and is the primary agent responsible for compliance along a coastline of 669 km and 239 landing sites. Whilst the DFOs of the other four lakeside districts have responsibilities in terms of undertaking compliance operations, MCS coverage is clearly limited and focused on Kigoma;
- Links between the Doria Unit and the centralised NSU appear to be tenuous, and it is not evident that reporting systems are being implemented effectively in terms of information

collation and analysis, nor is it evident that this information is processed in a manner that can be used to inform and improve MSC activities;

- Links between the DFOs, who are responsible for compliance activities in the southern districts, are weak and need to be improved;
- Neither the Doria Unit nor the DFOs or police officers have been provided with credible MCS training; there is a need to establish who is responsible for what actions and provide appropriate training e.g. inspectors, compliance officers, assistants, boat handlers, etc.

In terms of logistical and financial means, the main findings from the evaluation of MCS capability in Tanzania were as follows:

- MCS activities on the lake appear to be undertaken on an ad hoc basis and are constrained by a lack of regular funding and poor maintenance of vessels;
- The Doria Unit is based in Kigoma and has no meaningful assets in the other lakeshore districts.

The only serviceable vessel that is operated by the Doria Unit is a relatively small (7 m) and can only be used in the northern part of the lake in the Kigoma district. It would not be suitable for long compliance operations in the southern districts. Compliance in these regions can only be undertaken with the assistance of a police vessel, or alternatively it becomes the remit of the DFOs/police that have no access to compliance vessels, and thus compliance remains a shore-based activity (Petit, Philippe. Shipton, Tom. 2012).

21. Major Issues Relating to IUU Fishing

According to Kariuki (2012), illegal gears used in Lake Victoria include, the deployment of long lines using hook sizes of No.10 or smaller, the deployment of gillnets with a mesh size of less than 5 inches, the deployment of monofilament gears of all sizes, the use of beach seine nets, the use of poison, dynamite and cast nets. Although only one record of dynamite fishing exists, poison fishing occurred between 1997 and 2000, at which time the EU placed an export ban on Nile Perch from Lake Victoria, hereby abruptly ending any further poison fishing.

In terms of major issues relating to IUU fishing on Lake Victoria, Gitonga, (2013) highlights that processors are implementing strict regimes on size criteria for the fish they purchase, however, the huge regional market of illegal small fish is negating this effort. Strengthened co-management systems between the three riparian countries are thus necessary to curb IUU fishing and more specifically the control of regional trade in undersized Nile Perch.

On Lake Tanganyika, besides the high level of unlicensed craft and fishers, one major issue relating to IUU fishing is the use of illegal gear. According to the 2011 Frame Survey on the Tanzanian part of the lake, 25.5 percent of lift-nets and 26.7 percent of gillnets were illegal.

Furthermore, piracy is an increasing problem that has been identified as a major constraint to fishers and trade throughout the lake. The high number of unregistered vessels may be attributed to increasing levels of piracy, and the concomitant desire of the fishers to keep their vessels/equipment from being identified by the pirates (Petit, Philippe. Shipton, Tom. 2012).

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