Somali Knowledge Attitude & Practices Study (KAPS)

Fish Consumption in Somalia

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Study Conducted by
Food Security and Nutrition Analysis Unit (FSNAU)
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Information for Better Livelihoods

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Executive Summary

Currently, the FAO Somalia Fisheries sector implements two major fisheries projects funded by the Spanish Ggovernment and the World Bank, targeting mainly coastal communities in northeastern Somalia. The main activity under these projects is the promotion of fish consumption, which is a good source of protein, vitamins and minerals in the diet. Promoting fish consumption will consequently result in the overall nutrition and health well being of the population whilst also providing economic opportunities to the population.

Between 18th May to 25th June 2011, a KAP study on fish consumption was conducted in 25 locations in Somalia. In these sites, data was collected from the rural and urban communities residing in coastal, non-coastal and riverine areas. The main purpose of the study was to gain a full understanding on the common practices, attitudes, beliefs on fish consumption in Somalia, and the level of knowledge the community has on the nutritive and health benefits of fish consumption. This information will be used as a basis for developing relevant communication strategies promoting the consumption of fish in the country. In addition the information will supplement data collected in a socio-economic survey conducted in the Northeast area (Bari, Mudug and Nugal regions) in the Coastal Deeh livelihood zone, in order to design appropriate interventions in the fisheries sector. Focus Group Discussions (FGDs) and Key Informant Interviews (KIs) were the main data collection techniques used in the study. Other qualitative methods of collecting data also applied in the context of triangulation were case studies, informal observations and proportion piling. A total of twelve teams, each team consisting of one supervisor (FSNAU field staff), one moderator and one enumerator conducted the data collection activities. The trainings on data collection techniques and methodologies for the teams were conducted in Hargeisa and Garowe towns.

The overall results indicate that majority of the population in the country consume fish, however fresh fish consumption is most popular among the coastal and riverine populations, where it's generally more readily accessible. The pastoral population on the contrary do not consume fish often, they mainly consume red meat. The main types of marine products consumed among the coastal populations are tuna like species namely mackerel, emperor, grouper, saw shark, snapper, lobster, shrimps and sea turtle (*Qubo*). Among the riverine population, the main types of fish consumed are various species of catfish, tilapia and muilldaes. Fish is culturally acceptable and considered '*Halaal*', and is associated with various health benefits to the consumer. According to the respondents, the main benefits of fish consumption include good mental growth, improved growth of bones and teeth, provides the consumer with vitamins and minerals, helps in the formation of blood cells (both red and white), improves the body's immunity to disease and infection, improves sexual activity and treats various diseases and ailments. The main factors affecting the consumption and type of fish consumed include availability, cost, taste and smell, the known health benefits, and the lack of appropriate storage, preservation and knowledge of preparation techniques. On average, households consume fish at least once to twice a week. During the monsoon season consumption of fish is low because it is believed that consuming fish at this time will lead to diarrhoea and intestinal problems. The consumption of fish is also associated with treating ailments such as malaria, bronchitis, sexual dysfunction (increases sexual ability in men), backaches, asthma, typhoid fever, eye problems, constipation, anaemia, night blindness, malnutrition, goitre, memory loss, common cold and whooping cough. Fish is mainly prepared by frying and roasting, and is mainly consumed with *canjero*, rice, spaghetti and bread as an accompaniment and can be consumed as part of any meal of the day i.e. breakfast, lunch or dinner.

The consumption of fish is religiously and culturally acceptable and is associated with certain health benefits. The main reasons for low consumption are availability, cost and general lack of knowledge on storage and preparation of fish. When compared to red meat which is consumed by majority of the population, respondents feel that fish is more expensive except in the coastal areas of Bosasso and Berbera where fish is cheaper. There is also a concern of swallowing bones especially for younger children when consuming fish, therefore households with young sometimes opt to purchase the canned tuna fish with no bones. It is important for the community to be made more aware of the benefits of fish consumption, in addition they should be taught fishing techniques and preservation and preparation methods. It would be important to train health workers as part of the advocacy strategy through campaigns or health clinics and to also sensitize the community on fishing techniques, to improve the supply of fish. The provision of cold storage facilities will also improve the preservation of fish and ensure that even those away from the fish sources (sea or river) are able to consume fresh fish. Promoting fish consumption is extremely crucial, as it is readily available and is a good source of proteins, vitamin A, B, C and E and minerals all that promote the good health and nutritional status of individuals.

1. Background and Justification of the Study

Men fishing off the coast in Bosasso town, Puntland

The country's 3,330 km of coastline, the longest in Africa remains one of the country's most untapped resource. Some of the main reasons attributing to this include poor infrastructure (transport networks and storage facilities), which has restricted access to fish for a significant proportion of the population, the effects of seasonality on fish supply and the general lack of familiarity with fish among the population that are largely red meat consumers. Coastal fishing is the indirect source of income for about 400,000 Somalis but has the potential of becoming a significant source of foreign exchange earnings and new employment[1]. Likewise, the potential for aquaculture with approximately 188,384 Km²of water sources inland is still not being utilized, however if this was developed it would be an important source of rural employment and income and resulting in improved household food security and an improved nutrition situation of the population.

Although currently, traditional tastes and lack of consumer knowledge on fish consumption have confined the market to certain coastal areas, the shortage of meat experienced particularly during the recurring droughts has diverted some demand towards fish, especially among low income groups like internally displaced people (IDP) and the poorer households residing near coastal areas where fish is readily available. Fish is a good source of protein, vitamins and minerals in the diet. Encouraging the consumption of fish in the community, will not only help to improve the overall nutrition and health of the population that rely largely on meat as the main source of protein in their diet, but will also encourage economic growth. Regular consumption of fish can reduce the risk of various diseases and disorders, and promotes the healthy development of brain and eye tissue, reduces the risk of cancer and cardiovascular diseases and also prevents certain micronutrient deficiencies such as vitamin A and D[2]. The high prevalence of vitamin A (>45%) and anaemia in the country[3] as reported in the National Micronutrient and Anthropometric Nutrition survey undertaken by FSNAU in 2009 underlines the importance of encouraging the consumption of foods rich in vitamin A. The promotion of readily available vitamin A and D rich foods is fundamental in combating micronutrient deficiencies in the population.

The FAO Somalia Fisheries Sector currently implements two major fisheries projects funded by the Spanish government and the World Bank. These projects mainly target the coastal communities in northeastern Somalia. One of the key activities under these projects is the encouragement of fish consumption in the population to promote the overall nutrition and health well being of the population whilst also providing economic opportunities to the communities. In line with the FAO/Somalia's Plan of Action which proposes to improve the incomes of fisher folk by increasing post catch fish quality and improving fish markets in the country, it is imperative that an assessment of Somalia's fishing resources and consumption patterns be clearly established in

order to better inform programme planning, design and implementation. It was on this basis that FSNAU in conjunction with FAO Fisheries sector identified the need to undertake a knowledge, attitudes and practices study on fish consumption in Somalia.

1.1 Specific objectives of the Study

1.1.1 Aim of the Study

The main purpose of the study was to gain a full understanding on the common practices, attitudes, beliefs and level of knowledge of the community on the consumption of fish. This information will be used to develop relevant communication strategies aimed at promoting the consumption of fish as a means of combating macro and micronutrient deficiencies, which are currently a threat to the population. In addition information from this study will supplement baseline fisheries livelihood data in order to design and implement appropriate interventions in the fisheries sector.

1 FAO Somalia Plan of Action 2011-2012
2 Advantages of Eating Fish Foods - Health Benefits | Medindia http://www.medindia.net/patients/patientinfo/fishfood_health.htm#ixzz1f0JcNxpe
3 National Micronutrient and Anthropometric Nutrition Survey, FSNAU, MoH, MOHL, 2009

1.1.2 Specific Study Objectives

The specific objectives include the following:-

1. To determine the main and preferred types of fish consumed among the population in Somalia.
2. To establish which are the main and preferred types of fish consumed by various groups (e.g. gender, age-groups, socio-economic groups) in Somalia.
3. To identify the main factors affecting or influencing fish consumption among the population in Somalia.
4. To gain understanding on the cultural beliefs, practices and attitudes regarding fish consumption among the population in Somalia.
5. To determine the popular preparation and cooking methods used in preparing fish among the population

2. Methodology

The study was conducted in South Central Somalia, Puntland and Somaliland. Surveys were carried out in coastal and inland locations both in the rural and urban areas. The surveys purposively covered regions that include Juba, Shabelle, Gedo, Bay, Bakool, Hiran, and the Northeast regions of Bari, Sanaag and Nugal in addition to Awdal and Togdheer regions of Northwest (Somaliland).

Focus Group Discussions (FGDs), Key Informant Interviews (KI) and observations were the main data collection techniques used in the study. A total of 60 FGDs and 75 key informant interviews were conducted. Other qualitative methods of collecting data applied in the context of triangulation were case studies, informal observations, and photography and proportional piling. The respondents that participated in the study were selected with the aim of guaranteeing a chance to different members of the community to express their views and opinions openly. Representation from various groups based on gender, occupation and socio-economic backgrounds was considered and ensured. The total number of participants in each FGD ranged between 7-11 persons. In addition, to enable all the participants to freely express their ideas, the focus group discussions of men and women were conducted separately.

The FGDs were conducted by qualified teams comprising of an interviewer, a recorder and a moderator. The teams were supervised by FSNAU field staff. A total of 12 teams were used in the whole country. The KI interviews were conducted by FSNAU field staff and the main key informants included religious leaders, health workers and fish mongers. A two day training of the data collection teams was done in Hargeisa, Garowe and in South Somalia. In South Central Somalia, trainings were conducted by FSNAU field staff in Garbaharey, Kismayo, Huddur, Baidoa, Beletweyne and Mogadishu. During the training, the teams were trained on interviewing techniques and were taken through the study questionnaires and guides on the first day, while the pretesting which included conducting FGDs and interviews was done on the second day.

Table 1: FGDs and KIs conducted in the country

Region	Location	No. of FGD		No. of KI Interviews
		Male	Female	
Somaliland	Berbera	2	2	[1]1 Set
	Burao town	2	2	1 Set
	Bulahaar	1	1	1 Set
	Zeylac	1	1	1 Set
	TOTAL	**6**	**6**	**4**
Puntland	Bossaso	2	2	1 Set
	Eyl	1	1	1 Set
	Galkayo	1	1	1 Set
	Hafun	1	1	1 Set
	Gumbax	1	1	1 Set
	Lasqoray	1	1	1 Set
	TOTAL	**7**	**7**	**6**
Shabelles	Mogadishu	2	2	1 Set
	Adale	1	1	1 Set
	Afgoye	1	1	1 Set
	Hajiali	1	1	1 Set
	TOTAL	**5**	**5**	**4**
Jubas	Kismayu	2	2	1 Set
	Goob Weyn	1	1	1 Set
	Mareerei	1	1	1 Set
	TOTAL	**4**	**4**	**3**
Gedo	Luug Riverine	1	1	1 Set
	Banmulele village	1	1	1 Set
	TOTAL	**2**	**2**	**2**
Bay	Burhakaba	1	1	1 Set
	Baidoa	1	1	1 Set
	TOTAL	**2**	**2**	**2**
Bakool	Hudur	1	1	1 Set
	Abal	1	1	1 Set
	TOTAL	**2**	**2**	**2**
Hiran	Beletweyn	1	1	1 Set
	Shiniile	1	1	1 Set
	TOTAL	**2**	**2**	**2**
		30	**30**	**25**
	OVERALL	**60**		**75**

FSNAU staff conducting a FGD in South Somalia

After the pretesting, the tools were modified to include the issues arising during the pretesting exercise, such as the translation and names of the various fish species, the general flow of the questions and additional questions where necessary. To guarantee data quality, qualified staff from FSNAU supervised the data collection process and ensured that the interviews and focus group discussions were conducted as per the required plan and that the data was accurately recorded. In some of the locations where the security situation permitted, in order to ensure that all the information was captured, the supervisors taped the interviews and discussion using audio tape recorders, this also helped in cross checking the data collected and for future reference. All planned discussions and interviews were conducted within the allocated time frame. The data was entered into Microsoft excel for future reference. Thereafter as data was qualitative in nature a descriptive review was conducted to consolidate the overall conclusions.

3. Study Findings and Discussions

3.1 Fish availability and sources

In Somalia, fish is available in two major forms; canned, which is mostly consumed in the inland areas such as Bay and Bakool regions, and fresh fish, which is consumed mostly in the coastal areas such as Mogadishu, Bossaso, Berbera and along the riverine areas like Hiran and Juba regions. Fresh water fish is sold by fish mongers at sale points sometimes at the source or in the local markets. Canned fish is produced locally from the Lasqoray, Habo and Qandalla factories, and also imported from Yemen, it is therefore generally available in most shops especially in the urban areas. The fresh fish consumed consist of different species depending on the area whether it is (riverine or coastal). Emperor, tyuna like species and, mackerels, are some of the most commonly consumed fish species found in the country, table 2 indicates the various fish species consumed in different parts of the country.

Fresh fish is obtained from coastal areas namely; the Gulf of Aden in the north of Somalia, the Indian Ocean in the Central and Southern part of the country and the Juba and Shabelle rivers in South Somalia. The inland areas that are not near the rivers such as Bay and Bakool regions, where fresh fish is not readily available tend to consume more canned fish or dried fish over fresh fish. The canned fish however tends to be expensive and therefore out of reach for the poorer households, it is therefore less preferred in these inland locations. As expected, populations that reside in or near coastal or riverine locations, access fresh fish more readily. Inland towns that are not so far from the fresh fish sources, such as Burao town (at a 3-hour distance from Berbera) also access fresh fish sold daily in local markets, however the cost is high, limiting consumption to the middle or better off wealth groups.

Table 2: Common fish consumed in different regions of the country

Region	Location type	Examples of fish types	Forms
Somaliland	Inland urban (Burao), coastal urban (Berbera), coastal rural village (Zeylac, Bulahaar)	Kalwa	Fresh
		Goomeed	
		Garam	
		Sayan	
		Gaxash	
		Caaqar	
		Bayad	
		Xilif	
		Derrek	
Juba	Riverine village (Marare), Coastal urban (Kismayo,Goobweyn)	Gishar	Fresh/ Canned
		Mareerey	
		Balan	
		Gesule	
		Taraqad	
		Gesoole	
		Tartaabo	
Bay	Rural inland (Burhakaba and Baidoa)	Canood	Canned
		Dried fish	
		Malehe	
Bakool	Inland urban (Hudur) and Inland rural (Abal)	Tuna and dried shark	Canned/ Dried
Shabelle	Coastal urban (Mogadishu), Rural inland (Afgoye, Hajiali) and Coastal rural (Adale)	Madobe	Fresh/ Dried/ Canned
		Sharuub	
		Jeydar	
		Yuubi	
		Libaax	
Hiran	Riverine inland urban (Beletweyn) and Rural Riverine village (Shinile)	Adoomow	Fresh
		Koronto	
		Seefle	
		Kumiile	
		Clarias lizard	
Gedo	Riverine village (Luuq and Banmulele)	Malcay	Fresh/ Canned
		Yuumbi	
		Sharuub	
		Madoowe	
		Tuna	
Puntland	Coastal urban (Bossaso), Inland urban (Galkaayo) and Coastal rural (Eyl, Lasqoray, Hafun and Gumbax)	Tuan	Fresh
		Gadir	
		Sharwo	
		Gacoore	
		Gaxash	
		Saynuub	

Fish availability determines the frequency of fish consumption in most of the populations assessed, with households able to access fish more readily consuming fish daily-weekly depending on their purchasing power. For example the households assessed in Berbera coastal town in Somaliland and Mareerei a riverine town in Juba, reported consuming fish at least 3 times a week because it was readily available and inexpensive. However it was noted that in some areas, although the population resided near fresh fish sources a low proportion of households consumed fish regularly. For example, in the riverine town of Luuq in Gedo region, fish is not consumed often, mainly because of the limited availability, as a result of lack of fishing knowledge and equipment, lack of knowledge on the benefits of fish consumption and low demand for fish and high prices.

3.2 Factors affecting fish consumption

Somalia being an Islamic state, it was positively noted that all fish is considered *Halaal* therefore all types of fish can be consumed. Religious leaders encourage consumption because of health benefits and in most parts of the country is available. The consumption of fish varies across the country among the different populations and is influenced by different factors which are discussed below:

Cost- The cost of fish greatly affects consumption in terms of the actual price that fish retails for and also in relation to quantity. There is difference in the cost depending on the locations. Fish is generally cheaper in the coastal and riverine areas compared the other areas. Households in Burhakaba in Bay region, Burao in Somaliland, Huddur in Bakool region and Afgoye in Shabelle region consider fish to be expensive. In comparison to red meat which a majority of the population consume, fish is more expensive except in the coastal areas of Bossaso, Lasqoray and Berbera where fish is cheaper. Majority of the respondents felt that one would be able to purchase a larger quantity of meat compared to fish for the same amount of money The cost of fish varies depending on the selling unit, fish is sold either by piece, in some cases in kilograms and also by tins.

This variation is attributed to the quantity and unit of measurement of the fish where canned is measured in cans of 50-200 grams and fresh fish is sold in pieces or weighed in kilograms. Prices also vary regionally depending on the location and availability, for example marine turtles (qubo) which is the most expensive marine product in the areas costs $10-13 per kg in Berbera town, $14.00 in Mogadishu different from $ 13.2 in Adale. Canned fish prices also vary in towns depending on the consumption levels. A kilogram of yellow fin tuna ranges between $4.5-4.8 in Burao, $1.6 in Berbera, $2 in Luuq and only $0.8 in Bossaso and Lasqoray. This shows the difference in consumption in coastal and inland areas where canned is the most dominant fish in the inland areas, unlike in coastal areas where fresh fish is available thus there is a low demand for the canned fish.

Seasonality- Seasonality influences changes in consumption in terms of availability and cost. During the hot and dry seasons, there is a limited availability of fresh fish in the inland and coastal areas therefore most people consume canned fish or red meat. Seasonality also affects the road networks especially in rainy seasons where transportation to the inland areas is affected. The prices during these times increase thus affecting consumption.

Type of fish- The type (salt/fresh water, salted-dried, fresh or canned) affects preference and prices of fish. Canned is less preferred as it is sometimes more expensive. This is especially true in the coastal and riverine areas such as Bosasso and Beletweyne because they like the taste and quality of the fresh fish. In the inland areas like Burao and Luuq however, canned is the most popular thus a lower preference for fresh water fish. According to information collected, the women in Baidoa, Huddur and Afgoye prefer the dried salted fish (*Xanid*) above all other types of fish. Type of fish consumed is also influenced by the attached benefits by the consumers.

Workers from the Lasqoray Fish Factory collect fish

Availability- This depends on the physical distance and seasonality changes. In riverine and coastal areas where there are local fish mongers it takes a short time to buy fish and for some areas like Burao it could take 3 or more hours to get fresh fish from Berbera town. In this case the population will settle for what is available or not consume at all. Canned is more available as it has a longer shelf life than the fresh fish as it does not spoil, and it is readily available in almost all the shops.

Special events- Fish consumption is non-specific in a majority of the population but in some communities like Burao, Berbera, Mogadishu, Adale and Huddur, fish is consumed on Fridays, Eid, Ramadan and also prepared for guests. The type of fish consumed in such occasions is the commonly available fish in the area whether canned or fresh.

Presentation and quality- Quality and aesthetic values such as taste, texture and appearance also affects consumption. Women in coastal areas (Mogadishu, Berbera and Bosasso) mostly prefer fresh fish rather than other types of fish, while women in the inland areas such as Huddur, Afgoye towns prefer dry and salted fish. The wealthy groups in all the areas opt for fresh fish with soft texture contrary to the poor such as those in Afgoye and Adale who consume fish with rough texture and smell because they cost less than other types of fish. Common low quality fish mostly consumed by the poor are Gacoore (*Alestes affinis)* and Koronto *or electric fish* in Afgoye. Some respondents in Bardera and Shinile in Hiran

admitted dislike for fish due to associated smell therefore do not consume it at all. The quality of fish consumed also depends on preservation and storage methods employed. Generally, the preservation and storage techniques are poor thus most of the fish is consumed immediately after buying. Poor preservation methods and facilities are very often the cause of spoilage.

Fish being served in a household

Socio-economic status- This is mainly related to purchasing power. This affects the type and quality of fish consumed by various social groups. The poor might not be able to consume quality fish due to low income. The common types of fish consumed by the low income groups are *Alestes Affinis*, Koronto and Gusher in Afgoye and Kismayo which have rough texture and a lot of bones. Consumption of these types of fish for the poor pose a risk for children in these communities. Wealthy groups in all the areas prefer boneless fish because of the ease in consumption. They can also afford expensive types of fish products such as Qubo and Mackerel in Berbera, and saw sharks in Kismayo which both cost $10 a kilogram.

Gender- Generally there are no gender biases in fish consumption, slight preferences were noted in some of the towns assessed, where more men consumed fish compared to women or vice versa, for example in Bakool region, more men consumed fish compared to women, while in Burao town the opposite was noted since women consumed more fish than men. However, in some cases consumption can be affected by culture and belief of gender related benefits in the consumption of certain fish types. In Berbera fish is more readily available in restaurants compared to the households, making fish inaccessible to women who often cannot eat in the restaurants due to cultural restrictions. Preferences in terms of the type and presentation are quite common in both men and women. In Baidoa for example, females consume more of salted dried *Xanid* and yellow fin tuna whereas males in all the regions prefer some specific fish product types such as *Qubo*, *Geshore* and dried Shark to boost (according to them) their sexual potency.

Age and physiology- These affect the type of fish consumed as there are associated beliefs in the consumption of certain fish types in different age groups and physiological status. The consumption of fish is generally acceptable, however there were some negative beliefs related to the consumption of fish, such as that the consumption of fish with milk may lead to leprosy and that those with skin infections should not consume fish. Generally, most of the respondents across the country agreed that *Xanid, Sharub, Kurtay, Gacoore* and *Xirfi* are consumed by pregnant women because of nutritional benefits in reduction of anaemia and ensuring carriage of the pregnancy to term. At the same time, women are not allowed to consume electric fish, shark and *Qubo* in pregnancy and lactation due to the believed risks of abortion and other illnesses. It is also believed that the consumption of *Qubo* by may affect the health of the infant leading to asthma, snoring and stammering. Yellow fin tuna for example is not consumed by children below 24 months due to stomach cramps; instead they are given Mackerel and emperor fish which enhances growth and development. The elderly prefer boneless fish for ease in consumption. The consumption of Mackerel among the elderly is high, due to its benefits in tissue repair and regeneration. Consumption of fish also changes with illness for example, respondents in Bosasso feel that it is not good to eat fish in the event of skin infections. The types consumed for treating illnesses also change with their associated therapeutic benefits. *Clarius lizard* for instance is used for treatment of malaria in Shinile (Hiran) and *Qubo* is used for the treatment of gonorrhoea in Eyl (Puntland).

Access to information- Majority of the population have access to information on fish (benefits, preparation and handling) from health workers, local media, fish mongers and other fish consumers. This is not the case with other respondents in Bulahaar (Somaliland) and Luuq who feel that they do not have access to information on fish thus low fish consumption is noted.

3.3 Benefits of fish consumption

Fish has high quality proteins, omega 3 fatty acids, vitamins such as D and B_2, iron, zinc, iodine, magnesium, phosphorous, calcium and phosphorous. The essential fatty acids (omega 3) in fish are good for maintaining a healthy heart and brain as they help control blood pressure and cholesterol.[4]

The general benefits of fish according to the respondents (mainly in all the areas):

4 Division of Environmental Health, Office of Environmental Health, Safety and Toxicology, Washington State Department of Health, USA. http::/www.doh.wa.gov/ehp.oehas/fish/fishbenefits.htm.

- Strengthens bones and teeth especially in children
- Improves eyesight due to the constituent nutrients and prevention of blindness
- Boosts immunity and blood cell count. Fish improves the red blood and white cells count in the body
- Good source of proteins and vitamins such as Vitamin A, D and B
- Improve mental and physical growth in children
- For treatment of different ailments such as malaria, typhoid and anaemia

A variety of fish species are also believed to treat different ailments amongst the population. Preferences in consumption of these varieties are subject to their availability and the attached benefits. Examples of specific fish types and their benefits according to the respondents are given table 3 below.

Table 3: Associated Health benefits of specific fish species in Somalia

Type of fish	Treatment	Location
Yellow fin tuna	Treats typhoid, fever, diabetes, hepatitis, malnutrition and malaria	Burao
Mackerel	Constipation, anaemia, malaria, typhoid, fever and headache	Burao, Bardera, Berbera
Emperor	Treats, typhoid, constipation, diabetes and headache	Berbera
Shark	Improves sexual libido in men and women, treats headache and joint pains. Salted shark treats respiratory tract infections. Saw sharks improves vision	Hafun, Eyl, Kismayo, Burao
Qubo	Treats impotency in men, TB, chest problems and headaches	Luuq, Berbera, Kismayo, Hudur
Lizard	Treats malaria	Luuq, Bardera, Afgoye
Sharub	Cures anemia and malnutrition	Bardera, Luuq
Snapper	Treats typhoid and anemia	Baidoa, Mogadisho
Xirfi	believed to cure anemia, STDs, diabetes and hepatitis	Kismayo
Lobster	Improves immunity and iodine levels in the body	Eyl, Gumbax
Xanid	Treats malnutrition, anemia and goitre.	Mogadisho/Hudur
Diire-Afgatoob	Provides a laxative effect	Eyl
Gaxash, Derik, Bayad	Improve physical and mental growth	Bulahar, Kismayo
Canned tuna, Yiimbi	Source of proteins, carbohydrates and micronutrients, lower cholesterol and improve immune system	Luuq, Bardera, Kismayo, Burhakaba
Xanid, Libax, Tuna	Enhances brain functioning	Baidoa, Burao, Adale
Malay madoobe	Prevention of diseases such as malaria and gland infections	Mareerei
Ulenji	Protects fishermen from cold in rainy seasons	West gilib
Qubo	The oil from this fish is used for relieving backaches , boost immunity and improve sexual performance	Luuq

3.4 Handling and safety

Canned fish is hygienically prepared during processing therefore is readily consumed. However, the other fresh fish types are associated with hazards and risks during handling and storage. This is because fish like other types of meat is susceptible to growth of microorganisms and spoilage. Respondents in Bulahaar feel that fish handling in the production sites by the fish mongers is very unhygienic. This is due to poor handling and storage facilities, limited ice bags for cold storage, high electricity cost for storage in the inland areas such as Zeylac and Berbera. Another concern in fish safety is the lack of use of gloves or other protection tools by the fish mongers in cutting and preparing fish for sell thus introduction of germs that can cause illnesses. Suggestions given by the fish mongers in all the areas are training on fishing skills, modernized fishing equipments, establishment of fish markets and awareness creation in the communities on the importance of fish consumption especially in Burao, Bulahaar, Berbera and the inland rural villages.

Fish being prepared for export in Las Qoray

3.5 Challenges facing the fish industry

- Poor technology systems for handling fish, preservation and storage in all the areas.
- Low skills on fishing, handling, preservation and storage. This is evident in riverine towns such as

Bardera and Luuq where majority of the population do not consume fish because of their poor fishing skills

- Fish mongers are concerned by defaulting of their customers to pay their debts off when given on credit. In Beletweyne particularly, this is a great concern for the fish mongers.
- Limited storage facilities in Berbera and Mareerei accelerate spoilage leading to wastage. Limited refrigeration systems and high electricity costs affect the purchase of ice which compromises freshness and quality of fresh fish.
- Limited fishing tools such as boats, ropes and nets in Adale, Berbera and Mogadishu affect fishing.
- Poor markets especially when the prices increase. In Gedo, Mareerei and Burhakaba for example households prefer canned fish over fresh water fish because of the high prices of fish which is due to limited availability.
- Limited access to information on fish consumption among the community members like in Gedo, Bulahaar Kismayo, West Gilib and some in Burao.
- Piracy in the seas in Bossaso and the need for the government to monitor their water bodies and formulate national policies on fishing.

3.6 Conclusion and way forward

In conclusion, the consumption of fish is religiously acceptable and culturally acceptable and is associated with certain health benefits. The main reasons for low consumption are limited availability, high cost and general lack of knowledge, skills and equipments for preservation and storage. It is important for the community to be made more aware of the benefits of fish consumption, fishing techniques and preservation and preparation methods so as to improve the supply and overall consumption of fish. It would also be important to train health workers as part of the advocacy strategy through campaigns or health clinics. The provision of cold storage facilities will also improve the preservation of fish and ensure that even those away from the fish sources (sea or river) are able to consume fresh fish. Promoting fish consumption is extremely crucial, as it is readily available and is a good source of proteins, vitamin A and minerals all that promote the good health and nutritional status of individuals. Inclusion of information on benefits of fish consumption in the school curricula can be a good strategy of promoting fish consumption amongst the school-going children.

Fish is prepared for processing in a factory

Where there are no rivers or seas, consumption of canned fish which is usually readily available should be encouraged.

Generally, the respondents feel that consumption of fish will be improved in the population through the following means:

- Sensitization and creation of awareness on the importance of fish consumption through the health educators, local media and health facilities
- Educate people on the safety, cooking and preparation methods so as to maximise the benefits of fish consumption
- Improve storage through the use of refrigerators and other cooling systems. Electricity cost in refrigeration is also a concern for majority thus technologies on tapping other sources for electricity would be important
- Increase fish production and availability in the markets. Fish supply will be improved if the fishermen are trained on fishing skills and techniques and also given provision of fishing equipments such as nets and ropes.
- Improve technology and infrastructure like road networks, electricity, fishing and storage facilities (enhance cooling systems such as ice bags and build warehouses) to enhance general fish availability and consumption.

- Skills on postharvest and quality, such as, preservation and storage of fish through trainings of the mongers to help improve on their sales.
- Improve and rehabilitate physical markets for fish. Provision of permanent fish markets will increase accessibility of fish by the consumers and also stabilise the sale points for the fish mongers.
- Price reduction of fish to encourage more consumption. The high purchasing cost of fish discourages many consumers to consume fish
- Creation of industries for processing fish. The fish mongers feel the need for creation of industries to strengthen the fishing business so as to improve fish consumption in the country. This will also ensure the resources are tapped well in the country's territorial waters at the same time creating economic opportunities for many in the country.

Fresh fish ready for preparation

- Monitoring and protection of the national water sources and formulation of policies to regulate the processes and operations related to fishing in the country**.**

4. References

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4. http://cot.food.gov.uk/pdfs/fishreport2004full.pdf
5. National Micronutrient and Anthropometric Nutrition Survey, FSNAU, MoH, MOHL, 2009

5. Annexes

5.1 Case study on benefits of fish consumption

Foos has six children between 12 years and 3 years age. From time to time, her children get sick from diarrhea, coughs and colds. She says, "My daughter Halima (not her real name) was sick as a child, she was always catching colds and flu which made her unhealthy as a growing child. She never played with the other children as much because she was weak and had no appetite". Foos lives in Shiniile, a village in Hiran where fish is readily available from a nearby river. One day, a community health worker from the village health unit informed her of the benefits of fish. "The health worker told me that consuming fish will give my child energy and also improve her growth and development because of the protein and vitamins found in fish", says Foos. Foos made fish part of her and children's diet, she started preparing fish and would serve them the soft white meat in the soup. It was not too long before Foos noticed the benefits of fish consumption. She happily says, "My child who used to be so weak started recovering and looking healthier and stronger, she joined other children in playing regularly and was no longer getting ill like before ". Foos is now a strong advocate for fish consumption especially among children. "I believe fish has more benefits than meat and people should consume fish instead of meat. It is easier to trap fish from the river than to pay for it in the market", she adds. However she feels that the community requires training on fishing techniques, preservation and storage which is lacking in the area.

5.2 Data collection tools

5.2.1 Focus group discussion guide for fish consumption

District_____ ***Town***_____ ***Village*** _____
Team No._____

1. a) Is fish consumed in this community? Yes [ ] No [ ] If answer is No, probe for the reasons Why? and skip to question 14 _____
_____
_____
___
2. What is the proportion of this community that consumes fish? (Use proportion piling) _____
_____
3. What is the proportion of males in this community that consume fish? (Use proportion piling)
_____
4. What is the proportion of females in this community that consumes fish? (If there are gender differences probe further)
_____
_____
5. How often is fish generally consumed in the household? Tick the appropriate response below:-

Monthly Twice a month Weekly Twice a week Daily Other (specify)

6. Where does the community get fish from?_____
_____
7. How far is the fish source from the households (approximate)_____
8. How many hours does it take for the fish to arrive?_____
9. Is the fish generally in good condition when it arrives? _____
_____
10. Do you know the name of the types/species consumed? Yes No If No, skip to question 14 _____
_____
11. What is -
a) the preferred type (fresh, dry, salted, frozen) of fish commonly consumed in this community?
_____
_____

b) the preferred species of fish commonly consumed in this community?
_____
_____
12. What types/species of fish are commonly consumed by the following groups in your area? (*Use reference Table A*)

Table A			
Type of Fish	*Consumed (√) or not consumed (X*	*Form*	*Reason for not consuming*
List of Coastal Species of Fish			
Yellow fin tuna/ Tabadiin/jeydar			
Bonito tuna			
Skip jack / Dabagucun/sanuuro			
Mackerel / Taraaqad/yuumbi/Derek			
Sardine Ceydi/sardiin			
Grouper / sumaan			
Snapper / Qardabo/Tartabo			
Emperor / Gaxash			
Baby shark/dog fish /Jeer jeer			
Saw shark/ Geesole			
Lobster/ Kaambo/argosto			
Shrimps/ Sharookhis			
Lohad (oyster) Shell fish			
Qubo			
Xanid (salted and dried fish meat from Tebadin/ Shark meat			
Afgatoob			
Seeseemane			
Aseebe			
Silqo			
Sherwo			
Diire			
Gadir			
Gawlalo			
Others			
List of Riverine Species of Fish			
Clarias lizard/ Malay Madobe			
Eutropias/ Balan			
Bagrus/ Sharub			
White catfish/ Luubi/Ukumaale			
Tilapia/ Sharfato			
Mullidae/ Lusiya			
Sinodotis/ Angogo			
Electric fish/ Koronto			
Alestes Affinis/ Gacoore			
Kurtay			
Ulenji			
Other			

13. What type of fish is commonly consumed and preferred for the following various groups, please use table B below.

Table B														
Type	All people	Elderly people	Men	Women			Children < 24 months		Children 2-15		Wealth Group			Comments/ Recommendations/ Reasons Probe
				Non pregnant	Pregnant	Lactating	Male	Female	Male	Female	Poor	Middle	Wealthy	
Yellow fin tuna/ Tabadiin/jeydar														
Bonito tuna														
Skip jack / Dabagucun/ sanuuro														
Mackerel / Taraaqad/yuumbi/ Derek														
Sardine Ceydi/ sardiin														
Grouper / sumaan														
Snapper / Qardabo/ Tartabo														
Emperor / Gaxash														
Baby shark/dog fish /Jeer jeer														
Saw shark/ Geesole														
Lobster/ Kaambo/ argosto														
Shrimps/ Sharookhis														
Lohad (oyster) Shell fish														
Qubo														
Xanid (salted and dried fish meat from Tebadin/ Shark meat														
Afgatoob														
Seeseemane														
Aseebe														
Silqo														
Sherwo														
Diire														
Gadir														
Gawlalo														
Others														
Clarias lizard/ Malay Madobe														
Eutropias/ Balan														
Bagrus/ Sharub														
White catfish/ Luubi/Ukumaale														
Tilapia/ Sharfato														
Mullidae/ Lusiya														
Sinodotis/ Angogo														
Electric fish/ Koronto														
Alestes Affinis/ Gacoore														
Kurtay														
Ulenji														
Other														

14. What are the main factors influencing fish consumption among various groups? Please tick below.

Factors influencing fish consumption	**All people**	**Elderly people**	**Men**	**Women**			**Children < 24 months**		**Children aged 2-15 years**		**Wealth Groups**			**Comments/ Recommendations/ Reasons Probe**
				Non preg	**Preg**	**Lactating**	**Male**	**Female**	**Male**	**Female**	Poor	Middle	Wealthy	
Availability of fish														
Purchasing Cost														
Cultural beliefs														
Seasonality e.g. drought														
Socio-Economic (e.g poor, middle class, better off) attitudes														
Preference (fresh, frozen, salted, dried, canned)														
Health Reasons														
Others (distance to the source)														

15. What are the factors that influence the type of fish consumed or preferred? Tick where respondent agrees, if not mark with a x and explain further in the comments section

Type of Fish	Taste	Smell	Color	Texture	Presentation (fresh, salted, canned etc)	Cost	Availability	Known Benefit	Socio economic perception	Cultural/ Religious	Others	Comments
Yellow fin tuna/ Tabadiin/ jeydar												
Bonito tuna												
Skip jack / Dabagucun/ sanuuro												
Mackerel / Taraaqad/ yuumbi/Derek												
Sardine Ceydi/sardiin												
Grouper / sumaan												
Snapper / Qardabo/ Tartabo												
Emperor / Gaxash												
Baby shark/dog fish / Jeer jeer												
Saw shark/ Geesole												
Lobster/ Kaambo/ argosto												
Shrimps/ Sharookhis												
Lohad (oyster) Shell fish												
Qubo												
Xanid (salted and dried fish meat from Tebadin/ Shark meat												
Afgatoob												
Seeseemane												
Aseebe												
Silqo												
Sherwo												
Diire												
Gadir												
Gawlalo												
Others												
Clarias lizard/ Malay Madobe												
Eutropias/ Balan												
Bagrus/ Sharub												
White catfish/ Luubi/ Ukumaale												
Tilapia/ Sharfato												
Mullidae/ Lusiya												
Sinodotis/ Angogo												
Electric fish/ Koronto												
Alestes Affinis/ Gacoore												
Kurtay												
Ulenji												
Other												

16. Are there specific events/occasions when fish is consumed? (List the events/occasions and Reasons)
_____
_____

17. Are there specific times when fish is not consumed? (Probe for the reasons)- Specify by male and females
_____
_____
_____

18. Who in the household determines when or if fish should be part of the meal?
_____
_____
_____

19. Who provides information on the type of fish consumed by different population groups and how is this information passed on?
_____
_____

20. What role does fish consumption play in the human body?
_____
_____

21. Which social group (low, middle and wealthy) consumes fish more than others, what are the reasons why?
_____
_____
_____

22. Does the frequency of fishing at the main source have effect on availability and access? _____
_____
_____

23. Are there times/seasons when the prices of fish change (increase or decrease) (probe for the reasons for changes)
_____
_____
_____

24. Does the community always find fish in the market? _____
_____

25. Are there times of the day when fresh fish is not available? Probe to get reasons _____
_____

26. Are there any health conditions or treatments associated with the consumption of fish in the named species Use Table C to classify responses.

Table C																
Type	Condition	All people	Elderly people	Men	Women			Children < 24 months		School Age Children 2-15		Wealth Group			Comments/ Recommendations/ Reasons Probe
					Non preg	Preg	Lactating	Male	Female	Male	Female	Poor	Middle	Wealthy	
Yellow fin tuna/ Tabadiin/jeydar															
Bonito tuna															
Skip jack / Dabagucun/sanuuro															
Mackerel / Taraaqad/yuumbi/ Derek															
Sardine Ceydi/ sardiin															
Grouper / sumaan															
Snapper / Qardabo/ Tartabo															
Emperor / Gaxash															
Baby shark/dog fish /Jeer jeer															
Saw shark/ Geesole															
Lobster/ Kaambo/ argosto															
Shrimps/ Sharookhis															
Lohad (oyster) Shell fish															
Qubo															
Xanid (salted and dried fish meat from Tebadin/ Shark meat															
Afgatoob															
Seeseemane															
Aseebe															
Silqo															
Sherwo															
Diire															
Gadir															
Gawlalo															
Others															
Clarias lizard/ Malay Madobe															
Eutropias/ Balan															
Bagrus/ Sharub															
White catfish/ Luubi/ Ukumaale															
Tilapia/ Sharfato															
Mullidae/ Lusiya															
Sinodotis/ Angogo															
Electric fish/ Koronto															
Alestes Affinis/ Gacoore															
Kurtay															
Ulenji															
Other															

Preparation and consumption

27. How is fish prepared and cooked? What are the main ingredients used in its preparation? What is timing of meals where fish is consumed and what are the main accompaniments it is eaten with? Use table D to document responses

28. What is the measuring unit for the different types of fish? *Use table D*

_____

29. How much does the different types of fish cost (use the different measuring/weighing units?) *Use Table D* .

Table D					**Method of preparation**	**Method of cooking (boiling, roasting, frying)**	**Accompaniment**	**Timing of the meal (*snack, breakfast, lunch dinner)***
Type of Fish					**(include scaling, gutting, filleting etc)**			
	Measuring unit		**Cost per unit**					
Yellow fin tuna/ Tabadiin/jeydar								
Bonito tuna								
Skip jack / Dabagucun/sanuuro								
Mackerel / Taraaqad/yuumbi/Derek								
Sardine Ceydi/sardiin								
Grouper / sumaan								
Snapper / Qardabo/Tartabo								
Emperor / Gaxash								
Baby shark/dog fish /Jeer jeer								
Saw shark/ Geesole								
Lobster/ Kaambo/argosto								
Shrimps/ Sharookhis								
Lohad (oyster) Shell fish								
Qubo								
Xanid (salted and dried fish meat from Tebadin/ Shark meat								
Afgatoob								
Seeseemane								
Aseebe								
Silqo								
Sherwo								
Diire								
Gadir								
Gawlalo								
Others								
Clarias lizard/ Malay Madobe								
Eutropias/ Balan								
Bagrus/ Sharub								
White catfish/ Luubi/Ukumaale								
Tilapia/ Sharfato								
Mullidae/ Lusiya								
Sinodotis/ Angogo								
Electric fish/ Koronto								
Alestes Affinis/ Gacoore								
Kurtay								
Ulenji								
Other								

30. How is fish stored in the household?

a) When raw _____
_____

b) When cooked_____

31. What influences the cost of different types of fish? _____
_____
_____

32. A. Does the price of fish affect the level/rate of consumption? _____
_____
_____

B. Probe on the cost effect on consumption

_____
_____

33. How would you describe the price of fish (low/average/high) in relation to other meats?

_____
_____

34. In a situation when you have money to purchase meat, would you opt to buy fish? If so, what type of fish? _____
_____
_____

35. If fish was to be made readily available in the market, would that affect the community level of consumption? ____

36. What are your suggestions on improving fish consumption in this community? _____
_____
_____

Additional Notes:

5.2.2 Key Informant interview guide

5.2.2.1 Interview guide for religious leaders

District_____***Town***_____ ***Village*** _____ ***Team No.***_____

1. a) Which are the main types of fish consumed in this community?

_____
_____

b) How are they presented (dried, fresh, canned)?

_____
_____

2. Are there any gender preferences of species/forms of fish consumption in the household? If so please explain?

_____
_____

3. Do you know the benefits of consuming fish?

_____
_____

4. Are there any benefits from a religious perspective on the consumption of fish and if so, what are they?

_____
_____

5. According to Islamic religion, can all Species of fish be consumed? Why?

_____
_____

6. If the community is made aware of the health benefits of consuming fish, what would be the factors that would still hinder the consumption of fish?

_____
_____

7. Is fish readily available in the market? In what form mainly?

_____

8. As religious leaders, what kind of assistance would you require to promote fish consumption in the community?

_____
_____

9. What are your suggestions on improving fish consumption in this community? If fish was to be made readily available in the market, would that affect the level of consumption? _____
_____

5.2.2.2 Interview guide for fish mongers

District_____***Town***_____ ***Village*** _____ ***Team No.***_____

1. a) Which are the main types of fish consumed in this community?

_____
_____

b) How are they presented (dried, fresh, canned)?

_____

_____

2. Are there any gender preferences of species/forms of fish consumption in the household? If so please explain?

_____

_____

3. a) What is the main source of fish in this area?

_____

_____

b) Generally, how far is the fish source from the households (approximate)?

_____

_____

How often is fish received in the area/ market? (Twice in a day, once in a day, days in a week)?

_____

_____

How would you rank the availability of the following fish in the local market?

(1) Always Available (2) Only available in certain Seasons (3) Only available at certain times of the day (4) Never Available

_____Fresh fish

_____Frozen fish

_____Dried/salted fish

_____Tinned/canned fish

4. Which preservation methods are used to keep fish fresh at the market?

_____

_____

5. Does the frequency and the environment of fishing have an effect on availability and access? Explain

_____

_____

6. Are there times/seasons when the prices of fish change at the local market (increase or decrease)? Probe for the reasons for changes

_____

_____

7. Does the community always get enough fish from the market?

_____

_____

8. a) What is the usual measuring unit sold for the different species of fish?

_____

b) How much does the different species of fish cost (use the different measuring/weighing units)?

_____

9. What influences the cost of different species of fish in the market?

_____

_____

10. Does the price of fish affect the level/rate of sales?

_____

11. How would you usually describe the price of fish (low/average/high) compared to other meats?

_____
_____

12. Who mainly buys the fish? Probe for the different groups, men, women, social wealth groups etc.

_____
_____

13. Are majority of your customers restaurants/ hotels or individuals?

_____
_____

14. What methods of fish preparation are popular among your customers?

_____
_____

15. How is fish that is not bought discarded? Is it sold at a lower rate at that time? Or is it preserved to be sold later?

_____
_____

16. What challenges do you face while selling fish in the market?

_____
_____

17. What are your suggestions on improving fish consumption in this community?

_____
_____

18. Do you believe that the handling, safety, presentation and overall quality of fish could or should be improved? Why? How?

_____
_____

5.2.2.3 Interview guide for health workers

District_____***Town***_____ ***Village*** _____ ***Team No.***_____

1. a) Which are the main types of fish consumed in this community?

_____
_____

b) How are they presented (dried, fresh, canned)?

_____

2. Are there any gender preferences of species/forms of fish consumption in the household? If so please explain?

_____
_____

3. What benefits does fish consumption have on the health of an individual?

_____
_____

4. Which conditions or ailments can be cured or prevented by the consumption of fish? Name the disease and the specific species fish.

_____
_____

5. Which types of fish if consumed can have a negative impact (disease/condition) on the health of an individual?

_____

_____

6. If the community is made aware of the health benefits of consuming fish, what would be the factors that would still hinder their consumption of fish?

_____

_____

7. Do people have access to information on the benefits of fish consumption?

_____

_____

8. If people have access to information on the benefits of fish consumption, where do they get it from?

_____

_____

9. Would you advocate for the consumption of fish if you understood the health benefits of fish consumption?

_____

_____

10. Do you have nutrition education sessions with mothers? In these sessions do you discuss the benefits of consumption of fish? If so please explain.

_____

_____

11. What are your suggestions on improving fish consumption in this community?

_____

_____

12. If fish was to be made readily available in the market, would that affect the level of consumption?

_____

_____

13. Do you believe that the handling, safety, presentation and overall quality of fish could or should be improved? Why? How?

_____

_____

(Footnotes)

1 1 Set is 3 KI interviews with - with 1 health worker, 1 fish monger and 1 Religious leader