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SUSTAINABLE FISHERIES MANAGEMENT PROJECT (SFMP)

UNDERSTANDING THE FLOW OF FISH: A SCOPING VISIT TO NORTHERN GHANA



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THE
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Cover photo: Smoked Catfish in Bolgatanga, Ghana

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OVERVIEW

A four-day scoping visit was conducted in December, 2018 to better understand the types of fish species traded and consumed in Northern parts of Ghana. This exercise was conducted in collaboration with the Post-Harvest Unit of the Fisheries Commission at the Ministry of Fisheries and Aquaculture with support from the USAID/Ghana Sustainable Fisheries Management Project (SFMP). The primary key informants were fish traders and processors at markets in Bolgatanga (Upper East), Wa (Upper West), Tamale (Northern Region), and Techiman (Brong Ahafo). A snowball sampling technique was used to identify additional key informants such as cold storage owners and operators, fish selling stations (i.e. roadside or from a truck), and fish farmers from among their acquaintances.

Further details about each study site is located in Appendix A. A proposal for future research about fish consumption in the Northern Region is located in Appendix B. The proposal came out of a meeting with the University of Development Studies in Tamale. A list with names and contact information for some of the key informants interviewed during this scoping visit is located in Appendix C. A list of species identified during this scoping visit is located in Appendix D, and prices of fish and other proteins collected during this visit is located in Appendix E.

The main take-aways from this scoping visit are:

- There are more inland species (freshwater capture and aquaculture) than marine species sold at markets in Northern parts of Ghana. The majority (~70 percent) of inland species belong to the catfish family (species are listed in Appendix D).¹
- There are more marine species than inland species sold at cold storages in Northern parts of Ghana.
- There is a perception among those interviewed that the availability of both inland and marine species has declined over the past five years in Ghana, yet, demand for fish consumption is believed to be gradually increasing in Northern parts according to respondents' perceptions about the health benefits of consuming fish.
- The cost and logistics of transporting fish from "source to destination" is a barrier for traders and processors in Northern parts of Ghana.
- There is limited research conducted on the consumption of fish in Northern parts of Ghana according to the University of Development Studies in Tamale.

¹ It is important to note this scoping visit was conducted during the cold and dry season (Harmattan) which might influence the diversity of inland species seen at markets in the Northern Region, especially the abundance of catfish. Catfish is more resistant to colder temperatures than tilapia.

Table 1 highlights the dominant species found by location, and includes method of production and source. Fish is not ranked according to abundance.

Table 1: Types of fish species in Northern parts of Ghana

City	Type of fish ²	Location	Product form	Production	Source
Bolgatanga	Catfish	Market	Smoked	Inland capture, Farm	Yeji, Nasia area
	Tilapia	Market/Cold Store	Salted/Fresh	Inland capture	Yeji, Nasia area
	Nile Perch	Market	Smoked	Inland capture	Yeji, Nasia area
	Chrysichthys	Market	Smoked	Inland capture	Nasia area
	Anchovies	Market	Smoked	Marine	Saltpond, Abuesi, Sekondi
	Herring	Market/Cold Store	Smoked/Frozen	Marine	Saltpond, Abuesi, Sekondi
	Mackerel	Cold Store	Frozen	Marine	Imported (Tema)
Navrongo	Catfish	Market	Fresh/smoked	Inland capture	Tono Dam, Yeji
	Tilapia	Market	Fresh/smoked/frozen	Inland capture, Farm	Tono Dam, Volta Catch, imports, Yeji
Tamale	Catfish	Market	Smoked	Inland capture	Yeji, Buipe, Daboya, Dalun
	Tilapia	Market	Salted, Fresh	Inland capture, Farm	Yeji, Buipe, farmed from Volta Region
	Mackerel	Market	Smoked	Marine	Cold store (Tema, Kumasi)
	Herring	Market	Smoked	Marine	Takoradi, Techiman
	Anchovies	Market	Smoked	Marine	Takoradi, Techiman

² Most of the fish from coastal areas arrives already smoked to the Northern Region. Fish that is purchased from cold stores is smoked locally. There was no sign of Saiko fish in its frozen state, however, it could have been mixed in with fish that was already smoked coming from along the coast (i.e. very little evidence of small flatfish species mixed in with smoked pelagics).

City	Type of fish ²	Location	Product form	Production	Source
	Chrysichthys	Market	Smoked	Inland capture	White Volta
Wa	Herring	Market	Smoked	Marine	Banda, Jemma, Techiman, Takoradi, Accra
	Anchovies	Market	Smoked	Marine	Banda, Jemma, Techiman, Takoradi, Accra
	Mackerels	Market, Cold Store	Smoked, Frozen	Marine	Imported (Tema)
	Tilapia	Market	Fresh	Farm	Tema (Volta Catch)
	Cassava	Cold Store	Frozen	Marine	Tema
	Hake	Cold Store	Frozen	Marine	Imported (Tema)
	Catfish	Market	Smoked	Inland capture	Kalba, Wechiau, Black Volta
	Chrysichthys	Market	Smoked	Inland capture	Kalba, Wechiau, Black Volta
Techiman	Herring	Market	Smoked	Marine	Cape Coast, Takoradi, Mankessim, Agona Nkwanta, PramPram
	Sardines	Market	Smoked	Marine	Cape Coast, Takoradi, Mankessim, Agona Nkwanta, PramPram
	Tuna	Market	Smoked	Marine	Cape Coast, Takoradi, Mankessim, Agona Nkwanta, PramPram

City	Type of fish ²	Location	Product form	Production	Source
	Mackerels	Market	Smoked	Marine	Cape Coast, Takoradi, Mankessim, Agona Nkwanta, PramPram
	Large head hairtail	Market	Smoked	Marine	Cape Coast, Takoradi, Mankessim, Agona Nkwanta, PramPram
	Anchovies	Market	Smoked	Marine	Cape Coast, Takoradi, Mankessim, Agona Nkwanta, PramPram
	Tilapia	Market	Salted	Inland capture	Yeji
	Catfish	Market	Smoked	Inland capture	Yeji
	Chrysichthys	Market	Smoked	Inland capture	Yeji

Figure 1 links source of fish to its destination based on information provided in Table 1.

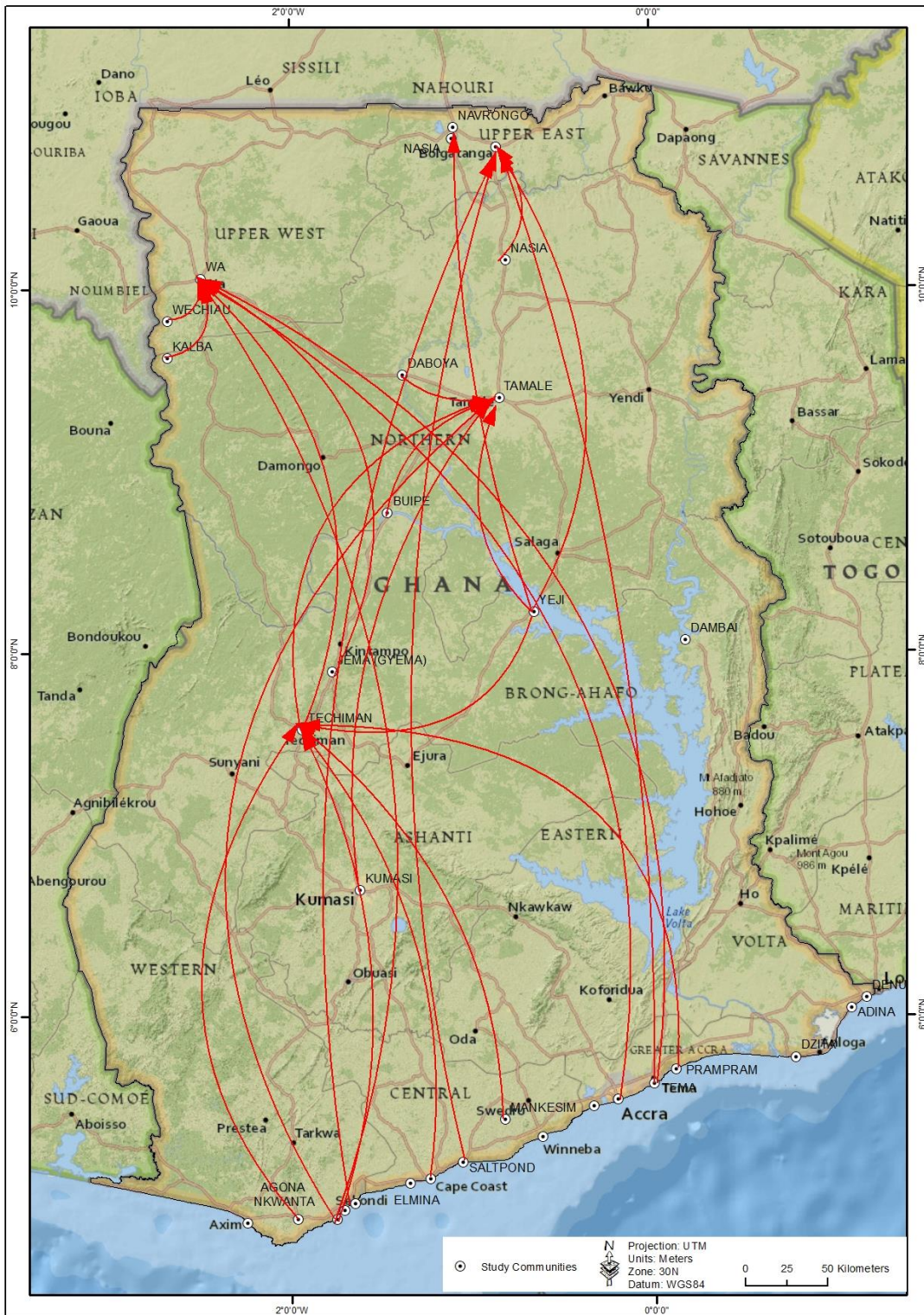


Figure 1 Source and destination of inland and marine species

Key informants helped identify specific factors that impact fish consumption and production for both inland species (culture and capture) and marine species in this region.

Factors that affect availability and consumption of fish in Northern Ghana are:

- There are no hatcheries nearby, the closest hatchery is the Pilot Aquaculture Center (PAC) located in the Ashanti Region. The lack of hatcheries limit availability of fingerlings for fish culture.
- There is no fish feed factory or sales point nearby, therefore, fish farmers have to order feed delivered from PramPram which increases a farmer's operational costs. The most commonly used fish feed in Ghana is produced by a company called Raanan Fish Feed West Africa Limited (www.raananfishfeed-wa.com).
- There is a lack of sufficient water for pond system in Upper West region (dry season is very long here).
- There is a risk of theft in grow-out ponds.
- There is poor management of fresh water species (i.e. they use traps to catch *Chrysichthys* species that are in a breeding stage, hence, they catch mainly gravid, or egg-carrying females).
- Crop farming activities within the catchment area cause pollution due to the use of fertilizer and chemicals.
- There are nomadic herdsmen that have taken over main watering points for their cattle and communities restricting access to natural ponds.
- The high cost of transporting fish from the coast to Northern parts of Ghana cuts into profits (i.e. it costs 250 Ghana Cedis to transport one large basket from Takoradi to Bolgatanga).
- The transport vehicles frequently breakdown, sometimes multiple times, which causes delay and loss of sales.
- There is the perception that there is fewer marine fish now than five years ago which increases the price of fish.

A factor that could facilitate future consumption or demand for fish is a changing perception that fish is healthier to eat than meat. The Northern Region is known to consume various types of meat such as guinea fowl, beef, chicken, and turkey, however, according to cold storage owners/operators and market vendors, this change is primarily driven by health concerns fueled by diseases associated with meat such as anthrax and mad cow disease. Based on purely anecdotal evidence (key informants), it is also reported there is more information available about the health benefits of eating fish. This information is said to be coming from health centers and targets women, however, no health centers were visited on this trip to validate this claim.

Future studies based on preliminary observations from this scoping visit include:

- A study to measure fish consumption at the household level.
- A study to monitor the effects of weather on the availability and diversity of fish species at markets to determine seasonal differences.
- A consumer price index for meat, seafood, eggs to calculate prices per serving.
- A scoping visit to understand the flow of smoked catfish from the Northern Region to the coast in Ghana.

Appendix A

Appendix A contains a more detailed description of each study site by day and by region.

Day 1: The Upper East Region

The Bolgatanga New Market is open every day, but the main market days alternate (every 3 days). Fish is sold as smoked, dried or frozen.

Frozen fish comes from a cold storage. The most common types of fish seen at this market are smoked inland (freshwater) species such as catfish, Nile perch, and chrysichthys species and salted tilapia that come from Nasia, Buipe and other villages that are located around the White Volta. Different vendors sell different fish species and sizes. For example, freshwater species are sold by those who come from the North, whereas smoked anchovies and herrings (i.e. marine species) are sold by women

who come from the Central Region. Those originally from the Central Region say they have settled with their families in the Upper East Region.

At this market, marine species come from Saltpond, Abuesi, and Sekondi located in the Central and Western Region. Marine species are transported to Bolgatanga all year-round and shipments are said to be higher during the bumper season. Smoked fish is stored in large baskets before it is sold at the market. One Fante trader has been selling fish for 40 years and all her children were born in the region. The cost of transporting one large basket of smoked or dried fish from Takoradi to Bolgatanga is 250 Ghana Cedis. One barrier is the high cost of fish, and use of chemicals which affects taste and availability of fish. Traders said they know when fish has been treated with chemicals saying they can see it, but they cannot talk about it because “that is what one has to sell.” Traders sell both wholesale and retail at this market and prices depend on species and size. For example, a small pan of herring or anchovies costs between 2-20 Ghana Cedis, whereas a large pan of smoked catfish costs 90 Cedis. Traders said they are aware of the marine closed season and support it and were disappointed when it did not happen. Traders also said that they have noticed a difference in quantity of fish from 5 or 10 years ago stating there is less fish available now. According to fish traders, people prefer fish to other meats for health reasons (less fat in fish).



Smoked catfish



Smoked marine species

The Navrongo Fish Market is located on the main road between Bolgatanga and the town of Paga. Like the Bolgatanga New Market, it is open every day but its main market days alternate (every 3 days). This market sells mainly fresh fish. The main type of fish seen was fresh tilapia which comes from various sources and smoked and fresh catfish from the Tono Irrigation Dam in Navrongo. Fresh tilapia (i.e. not previously frozen) comes from either a fish farm in Navrongo, a Dam nearby called “Tono Dam,” or Volta Catch. Volta Catch sends a truck full of tilapia to Tamale every Wednesday from the Volta Region. Frozen tilapia is imported from China but comes to Ghana through Burkina Faso. The volume of tilapia coming from Burkina Faso³ is unknown but we heard about its presence from other sources.

In addition to tilapia and catfish, smoked marine fish are also sold on the main market days. Processors said they use round, metal barrel and chorkor stoves to smoke fish. Some of the women traders and processors own their own canoe and use set nets to catch fish at Tono Dam. Traders and processors also said they own cold storages or have deep freezers at their house to store fish, mainly herring, mackerel and sea bream (upon request due to cost) that they purchase from Kumasi. There are also two other privately-owned cold storages in Navrongo where traders and processors can buy fish. The cold storages were not localized on this trip but compared to others seen on this trip, they are typically made from small, insulated or metal containers used in shipping. The traders also sell fish to restaurants, some of which specialize in Tilapia. The 10-kilo carton of Tilapia cost 115 Cedis for 500-gram whole frozen tilapia. Traders also sell tilapia by the piece, or 4 fish for 50 Cedis. Grilled tilapia fish sells for 20-25 Cedis at a restaurant. Traders send catfish and tilapia to Wa and Tamale. Traders also send smoked catfish to Accra by bus upon request. When the weather turns cold, fishermen mainly get catfish, not tilapia. According to one trader, being able to sell different sizes of tilapia means that everyone can afford to buy something but in comparison to meat, it is more difficult to feed a household with fresh tilapia. Another trader admits smaller-sized fried tilapia is cheaper and is eaten with Kenkey or fried yam. Beef is a little cheaper than some types of smoked fish, for example, with 2 Cedis one can get a piece of beef, even if it has a lot of fat on it. Depending on the size and type of fish, smoked fish can be quite expensive according to traders and processors. Traders and processors said they are not getting enough fish, for example, they used to go to Yeji to buy fish but now there is not enough and the cost of traveling is not worth it, and also because the closed season in the Tono Dam (June-August) is no longer being observed because it is not being enforced. With respect to enforcement, there are



Chinese tilapia from Burkina Faso

³ Besides Chinese tilapia imports, Burkina Faso has large tilapia farms located in Tenkodogo near Bagre Dam.

staffing limitations in this particular Region according to traders at the market. There are only two Fisheries Commission Officers at the Dam because others have retired. Traders and processors say they want the closed season enforced in the Tono Dam because “they get a lot of fish when it opens again.” Traders and processors are aware of chemicals used in fishing and the marine closed season. These observations were also commented elsewhere during this trip, however, the extent of the problem (of chemicals used in fishing) is not known.

The Cold Storage at New Market orders imported mackerel by phone from other cold storages from Tema Harbor and Kumasi and sells it to restaurants in 30 kg cartons, or as individual pieces to customers. There are around 6-7 cold storage facilities in Bolgatanga.



Tono Dam

Joseph, a tilapia farmer heard about the interviews we were conducting in the region and called us to talk about his fish farm located in the Tono Dam area. Joseph has 4 ponds that produce ~30,000 kg/per year of tilapia and catfish. Joseph sells ~1/3 of his production to traders in the area and the rest to restaurants in Bolgatanga. Joseph said the cost of feed is his biggest challenge. The feed he uses is made from fish and soybeans. According to Joseph, they have these raw ingredients in his region but need a pellet machine to make their own feed. Currently, Joseph pays to ship from Raanan in PramPram to his farm in the Upper East Region which adds to his operational costs. Another challenge Joseph faces in his market is competition from cheaper, imported tilapia. Joseph provided size ranges for tilapia raised in this region, the sizes are Size 1= 30 grams per fish, Size 2=150 grams per fish, Size 3=250 grams per fish, and Size 4=500 grams per fish.



Mackerel being sold from a cold storage in Bolgatanga market

Day 2: The Northern Region

The Triton Tilapia Truck stop and Retail Point sells crates of fresh tilapia out of a truck in an empty parking lot in Tamale near the Tamale Jubilee Park. Every Tuesday, the Triton Tilapia Company sends a truck full of farmed, fresh, and iced tilapia to Tamale from Dodi Papase in the Volta Region. According to their sales representative, Triton sells between 40-60 crates of tilapia per day. The price for a crate of fish ranges between 310-390 Ghana Cedis depending on the size of tilapia. The retail fish depot also sells tilapia from a fish farm located in Savelugu on the way to Bolgatanga, and sometimes they sell wild capture tilapia that comes from

Mankango in the Northern Region. The sales representative from Triton also confirmed that a truck from another company, Volta Catch also delivers fresh tilapia to Tamale, but on Wednesdays. According to the sales representative, tilapia consumption is down because of an outbreak that caused fish to die in Akuse. This incident impacted sales of tilapia because it was rumored to pose a risk to human health from the way it was communicated to the public. It also took a long time for lab results to come back confirming there was no health risk to humans. Another factor affecting consumption of tilapia is the variety of food available in this region like maize, rice, and yams which are cheaper than fish. Tilapia is mainly sold to restaurants that grill it outdoors, therefore, in the rainy season consumption also goes down because some do not grill outdoors when it rains.



Fresh tilapia sold from a truck

The Kumbungu Fresh Fish Station sells mainly smaller, inland species and catfish from Daboya located along the White Volta and also from Dalun which is near the Dam. Traders and processors sell fresh and fried fish to wholesalers and households. With a minimum of 5 Cedis one can buy fish to eat.



Catfish species

The Central Market is the second largest market in Tamale. At this market, traders and processors sell inland (i.e. freshwater) and marine fish species. The main types of inland species found are salted tilapia, smoked catfish, and chrysichthys, oheneba, odo, heterotis, and chale species which dominate in Lake Volta. Freshwater or already smoked fish comes from Yeji, Buipe, Dalun or the nearby Dam. Fish are sold by the size of the bundle or pan. Prices range from 400-600 Ghana Cedis depending on the size of the pan.

Price of salted tilapia ranges between 2-10 Cedis. The types of marine species seen were smoked mackerel, herring, anchovies and to a lesser extent smoked tuna and fermented fish. One piece of whole smoked tuna costs 30-35 Cedis. Chunks of smoked tuna sell for 5 Cedis per piece. Other prices range from 5-10 Cedis upwards. Anchovies and herrings coming from Takoradi and Techiman. To prevent further spoilage, processors use round, metal barrel smokers to fish.



Salted tilapia

The Aboabo Market is the largest market in Tamale and is known for its sale of maize. There were no fish traders to interview in the morning when we visited this market.

The Sakasaka and Ward K fish smoking Stations sell smoked fish (and smoked chicken). A round, metal barrel stove is used to smoke fish. The main types of fish they smoke are

mackerel, cassava fish, “charle” and Baraccuda (odue). The processors buy fish to smoke from cold storages in Tamale and sometimes from Kumasi and Tema. The processors also own deep freezers to store fish if they cannot smoke it all. The processors sell their smoked fish at the Tamale Central Market. Selling Prices start at 5 Cedis upwards depending on the size of the bundle or pan. Smoked mackerel head sells for 1 Cedi. According to the processors, the Northern region prefers to eat chub mackerel. The processors originally come from Senya Breku in the Central Region but they have lived in Tamale for 15 years.

The University of Development Studies (UDS), Nyankpala Campus is located in Tamale. Dr. Akwasi Ampofo-Yeboah is head of department for Aquaculture, Fisheries Science and Aquatic Biology at UDS. Dr. Ampofo-Yeboah expressed interest in our research and submitted a proposal for future work on the topic of fish consumption in the Northern Region (See Appendix B). We learned that UDS works closely with the University of Cape Coast (UCC), a project partner under the USAID/Ghana SFMP. According to Dr. Ampofo-Yeboah, some of the students from UDS receive support from UCC (with USAID/Ghana SFMP funds). The contact information for Dr. Ampofo-Yeboah is located in Appendix C.

Day 3: The Upper West Region

The Wa Central Market is open every day but has only one main market day that alternates days. The primary type of inland fish found at the time of the visit which was not the main market day was fried “one mouth thousand”

(*Sierrathrissa sp.*) and comes from the Volta Eastern Region. Salted tilapia is also sold at this market. The dominant types of marine species sold at this market are smoked herring and anchovies, and to a lesser extent smoked mackerel, and fermented fish. Marine species comes from Banda, Jemma, Techiman, Takoradi, and Accra. Traders either travel to these markets themselves to buy it, or have it transported to Wa by bus. Smaller-sized species such as herring and anchovies are sold either whole, or with the head and skin from the body removed which is unique to this region. The price of whole smoked herring ranges between 2-40 Cedis depending on size of the pan. Whole, smoked anchovies sell between 2-20 Cedis/pan. Whole herring and anchovies sell cheaper than without the head and skin. A crumb-like mixture made from the head and skin of smoked herring and anchovies sells for 5 Cedis/bowl. Traders claim there is not as much fish as five

years ago which according to them could be the reason why the cost of fish is higher now. One trader had heard about the marine closed season but was not in support of it. We also gathered prices for the cost of beef. For 1 Cedi one can buy a piece of beef or 10 Cedis/lb for beef.



Fish bundles and crumb mixture

The Volta Catch Fresh Tilapia Station is located along the main road in Wa opposite the Stanbic Bank. This station is owned and managed by a former Volta Catch employee. Every week, the owner orders fresh tilapia from the distribution center in Tema and has it shipped to Wa. This station sells 250 kg per week of tilapia weighing ~500 grams each. Clients include households, restaurants, police officers (mainly) and sometimes students who prefer the smaller sizes. He stores the fish in his personal freezer. Tilapia sells between 2-25 Cedis/kg depending on the size of fish (i.e. smaller sizes are cheaper than larger-sized fish). According to the owner, about 90 percent of people in Wa consume meat over fish because of price. The owner says he competes with larger-sized Chinese tilapia that comes to Ghana from Burkina Faso because it is cheaper than local, fresh tilapia, however, people prefer the taste of local over the imported tilapia.



Fresh tilapia in Wa

The Weziena Cold Storage is located along the main road in Wa, with an outlet (a smaller cold storage facility) at the Wa Central Market. The larger facility can hold up to ~160 tons of fish and meat. The owners also have another cold storage facility in Bolgatanga. The owners send their own truck to Tema every 3 weeks to purchase fish and other types of meat they retail and wholesale directly from their cold storage facility. The type of fish they get depends on the availability from the cold storage facility they buy from in Tema, but they usually get horse mackerel, cassava fish, hake (according to the label) and sometimes redfish (Sea breams).



Cold storage facility

According to the owner, sales are higher between January to June which is the non-farming season which means there are more people in Wa. Between July-October, business slows down because farmers migrate to their farmland. According to the owner, people eat fish because it's healthier and because it is cheaper than meat. There is a shortage of fish, even in Tema, according to the owner. Another challenge they face is the cost of electricity which is very high (we heard from a fish processor that this cold storage turns off their freezer periodically to save electricity which impacts the quality of the fish). There are about four other cold storages like this one in Wa.

The National Fish Traders and Processors Association (NAFPTA) Secretary in Wa buys smoked fish—either inland or marine—from Navrongo, Buipe, Yeji, Techiman, and Kalba (along the Black Volta) and sells it to surrounding communities such as Nadowli, Jirapa, Lawra, and Hamele. A large basket of smoked fish that costs 500 Cedis will immediately sell at the market according to the secretary. The NAFPTA secretary also buys fresh fish from Wechiau, Bole, Tono Dam, and Kalba (Black Volta) and smokes it immediately using a round, metal barrel stove. Overall, the availability of fish has declined over the last five years according to the NAFPTA secretary (whereas before it was moderately available, now there is not much available). Transportation (of fish) is a major problem because trucks break down frequently

causing delays in delivery. People prefer fish over meat in her opinion because of the price of fish. Pork is also considered affordable; a leg of pork sells for 250 Cedis.

The Fisheries Commission Regional Director in the Upper West Region stated the majority of fish in this region are inland species that come from the Black Volta which borders Burkina Faso, and tributaries from the White Volta in the Eastern part of Wa. The flow of the tributaries from White Volta have changed due to the construction of a dam in Burkina Faso which affects the flow and availability of water, impacting fishing activities. For example, pools form in some parts within the basin of the White Volta during the dry season, whereas, the Black Volta flows year-round. There are about 200 reservoirs in the Upper West region where men fish. The fishermen are mainly Dagaares, Moshies, Ewes, and Hausas (Muslims and Waalas do not usually fish). Whatever marine fish is sold is sourced from the Central and Western Region (Takoradi, Shama, Cape Coast). According to the Regional Director, herrings is the cheapest type of fish, it even retails cheaper in Wa than down South because if one does not reduce the price, it will not be able to sell in Wa because many cannot afford it. Traders and processors also send fish from the Kalba market down south (i.e. fish flows the other way). According to the Regional Director, there are about 15 cold storage facilities in the Upper West region.

Day 4: Techiman in the Brong Ahafo Region

The Techiman Market is a large, well-organized market. Its main market days are Wednesday-Friday. This market is reported to be a “depot” for smoked fish because a lot of people come here to buy fish (retail and wholesale) from nearby communities, Kumasi, and the Northern Region. The reason they come to Techiman is because the prices of fish are cheaper. Fish retailers are grouped together in one area of the market while wholesalers are based in another area of the market. There is a variety of smoked, marine fish species sold here such as herring, sardines, tuna, and large head hairtail. Marine species come from Cape Coast, Takoradi, Mankessim, Agona Nkwanta, and PramPram. There is also redfish and mackerel which could’ve been smoked in Techiman. Inland species, all of which come from Yeji, include smoked catfish, salted tilapia and fermented fish. According to traders and processors, there is a decline in availability of fish compared to five years ago making fish more expensive to buy. Another factor that affects the price of fish is the cost of transport from the coast to Techiman. With a minimum of 1 Cedi a consumer can still buy some smoked fish (the type of fish was not specified). With 2 Cedis, one can buy salted tilapia. For comparison’s sake, a fatty piece of meat costs 1 Cedi.



Market day in Techiman

The Nyame Na Aye Cold Storage is a smaller cold storage located in the market that sells marine fish like cassava fish, redfish, horse and chub mackerel and chicken. All the fish comes from Tema. It is owned by the same person that has another, larger cold storage facility in the center of Techiman.

Appendix B

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF NATURAL RESOURCES AND ENVIRONMENT

DEPARTMENT OF FISHERIES AND AQUATIC RESOURCES MANAGEMENT

PROPOSALS TO USAID FOR CONSIDERATION –DECEMBER 2018

BY

DR. AKWASI AMPOFO-YEBOAH

(I) FISH CONSUMPTION PREFERENCE AND FACTORS INFLUENCING THE CONSUMPTION IN NORTHERN GHANA

(a) Problem Statement and Justification

In recent times the rising risk of disease contraction associated with meat consumption has led to the increase demand for fish and fish products, as a result people have different fish preference and reasons for their preference. Fish consumption preference is attributed to a number of factors including individual, environmental, socio-cultural, sensory (taste, smell, colour, texture) and non-sensory factors like behaviour, beliefs, personal characteristics, risk perception (Honkanen et al., 2005). There is paucity of information on studies or work done in the Northern Ghana on the fish consumption, preferences and factors influencing the choice of fish species. Outside the study of Alhassan et.al. (2012), conducted in Tamale metropolis, much has not been done in the whole area of Northern Ghana and the factors influencing the consumption. There is, therefore the need to undertake a comprehensive study to assess the fish consumption preference occurring in Northern Ghana, where there is a perception that people from this part of Ghana do not like eating fish. If inhabitants are eating fish, what are the factors influencing the consumption in the area. The study will further help assess and create the people's awareness on the important benefits associated with fish consumption in order to effect a positive change.

The research will seek to find answers to the following questions:

- i. What are the fish consumption preference occurring in Northern Ghana
- ii. What is the frequency of fish consumption in Northern Ghana at the household level
- iii. What are the factors affecting the fish consumption preference in Northern Ghana

(b) References

- a. Alhassan, E. H., Boateng, V. F. and Ndaigo, C. (2012). Smoked and frozen fish consumption and marketing channels in the Tamale Metropolis. *Ghana Journal of Development Studies*. 9(1): 20 – 29.
- b. Honkanen, P., Verplanken. B. and Olsen, S.O. (2006) Ethical values and motives driving organic food choice. *Journal of Consumers Behaviour*. 5: 420-430

II. FISH FARMING-AN ALTERNATIVE LIVELIHOOD ACTIVITY FOR RURAL WOMEN IN NORTHERN GHANA

(a) Problem Statement and Justification

Poverty levels in the rural north are the worst in the country. The principal source of livelihood is subsistence farming and the bulk of the household income is generated from the sale of surplus farm produce. Women in rural Northern Ghana actively participate in farm activities, perform household chores and care for the children as mothers, but invariably they are not given their due share of the income that is generated. In addition, they are expected to contribute to the cost of education and health care of the children. This scenario tends to impoverish the women and marginalize them, compelling them to find time to engage in some income-generating activity to be able to support the family budget and improve their own livelihood. The most popular and readily available income generating activity for women in the rural north is fuel wood harvesting, wander long distances in the Guinea savannah woodland to harvest scarce wood, including reserved economic trees, such as shea butter and dawadawa. The harvested wood is usually processed into charcoal for sale. Without doubt, this type of economic activity is time and energy demanding, and hence very stressful to the women. It is also environmentally unfriendly because it aggravates the problem of desertification, which has become a national concern in recent years.

This project seeks to mobilize and sensitize rural women in the north to undertake integrated fish farming as an alternative livelihood activity. Integrated fish farming is ecologically efficient, environmentally friendly and cost-effective, because it ensures recycling of farm wastes and promotes optimal utilization of land and water resources. Fish production is suggested because fish is a nutritious source of animal protein. It has balanced amino acids, low in cholesterol and saturated fatty acids, but high in poly-unsaturated fats and essential fatty acids. The traditional source of fish protein in the country is wild fish caught from our marine and freshwater resources. However, recent population increase and overfishing in our waters have led to chronic shortages of fish supplies in the nation as a whole, and in the north the situation is alarming. Consequently, the price of fish has shot up beyond the reach of the poor, resulting in widespread protein malnutrition among vulnerable groups such as pregnant women, nursing mothers, infants and children.

It is common knowledge that the poor in the north subsist predominantly on cereal-based diets deficient in protein. The need to supplement household protein levels to improve the nutritional and health status of the poor cannot be overemphasized. Fish farming has the potential to augment decreasing supplies of wild fish and bring about a reduction in the price of fish to benefit the poor.

III. DEVELOPMENT AND PROMOTION OF SUSTAINABLE AQUACULTURE TO SUPPORT POVERTY REDUCTION AND FOOD SECURITY PROGRAMME IN NORTHERN GHANA

(a) Problem Statement and Justification

The effort of government and non-governmental organisation (NGOs) to reduce poverty and food insecurity in the three Northern Regions (i.e. Northern, Upper West and Upper East Regions), has so far centred on micro-credit facilities to boost up crop production, livestock husbandry and other small businesses. Fish promotion through fish farming has not been given

the required attention, even though the northern regions have huge potential for fish culture. The northern regions are endowed with some of the biggest rivers in Ghana, namely, Black Volta, White Volta, Red Volta, Oti and Daka Rivers. These rivers have large flood plains that could be put to fish culture. The major river sub-basins have been augmented by construction of storage reservoirs (dams and dugouts) that supply water for domestic use, livestock watering and dry season gardening during the long dry season characteristic of the region. As of 2002, Northern region alone had over 202 storage reservoirs with a total surface area of 1,200 ha. Put to fish culture, these storage reservoirs can produce 7,200 metric tonnes of fish and a revenue of approximately ₵22 billion cedis annually. Assuming 2 unemployed youths were trained to manage 1 ha surface area of water for fish cultivation, 2,400 youth could be gainfully employed in one year thus optimum exploitation of the abundant water resources for fish culture can make the Northern region self-sufficient in fish supply, improve house hold food security, create employment and reduce poverty in a sustainable manner.

(b) Goal

The goal will be to promote fish culture in Northern region to reduce food insecurity and poverty by integration of fish farming into existing food production and animal husbandry systems.

(c) Objectives:

- 1) To develop and promote integrated fish farming in northern region
- 2) To train rural communities in northern Ghana to acquire integrated fish farming skills.

IV. UTILIZATION OF THE NUMEROUS SMALL WATER BODIES IN NORTHERN GHANA

(a) Problem Statement and Justification

The major occupation of the people in the north is agriculture. To encourage farming activities in the long dry season, the government and other development agencies including non-governmental organizations have provided many communities with storage reservoirs. In addition to dry season farming, the reservoirs are used for livestock watering and domestic purposes. These reservoirs offer a great potential for fish culture. In the Upper East region there are 220 functional storage reservoirs with total surface area of 3,145 ha, while in the Northern region there are 202 functional reservoirs with total surface area of 1,200 ha and the Upper West has 230 reservoirs. Optimal utilization of the enormous water resources for fish culture can make the north self-sufficient in fish supplies, improve food security, and can also create employment opportunities and reduce poverty.

Culture-based fisheries (CBF) are stock enhancement practices in water bodies that are generally incapable of supporting sustainable fisheries through self-recruiting fish populations, and where the stock is managed and owned, either individually and or collectively. Most developing countries in Asia, as well as some in South America (e.g. Cuba, Brazil), have recognised culture-based fisheries (CBF) as an effective way of increasing the supply of fish as food in rural areas, at an affordable price. Culture-based fisheries also provide additional income to rural farmers, thereby contributing to poverty alleviation. Culture-based fisheries have added advantages in that, unlike the more conventional aquaculture practices, they are less resource intensive and need less technical skills at the farmer level. As such, culture-based fisheries are an attractive

strategy for investment and development for most governments. These fisheries are also an effective secondary user of water resources in small impoundments in rural areas.

(b) Goal

The goal will be to promote fish culture in small- water bodies in Northern region to reduce food insecurity and poverty by utilizing all existing reservoirs by integrating fish farming into existing food production and animal husbandry systems

Appendix C

Table 2 contains a list of some of the key informants interviewed during this visit. The list does not include traders and processors that were our primary key informants at the various markets we visited.

Table 2. Key informants in the Northern Region

Contact name	Job description-location	Telephone number
	NAFPTA Executive Director- Tamale	
	NAFPTA Rep-Tumu (Upper West)	
	NAFPTA Secretary-Wa (Upper West)	
	NAFPTA Executive Director-Upper East	
	FC Regional Director-Upper West	
	Head of Department at UDS, Aquaculture, Fisheries Science and Aquatic Biology-Tamale	
	Tilapia Fish Farmer-Tono Dam	
	Volta Catch Tilapia Representative-Wa	
	Weizena Cold Storage in Wa	

Appendix D

Table 3 contains the names of fish species seen on this scoping visit.

Table 3. Fish species seen in the Northern Region

English name	Local name	Scientific name
Elephant -snout fish	Ablor	<i>Mormyrus spp</i>
Frankfish	Odo	<i>Gymnarchus niloticus</i>
Tigerfish	Akao	<i>Hydrocynus spp.</i>
Moonfish	Takra	<i>Citharinus spp.</i>
Bagrid catfish	Gblolovi	<i>Chrysichthys spp.</i>
African butter fish		<i>Schilbe spp.</i>
Catfish	Adwene	<i>Clarias sp. Heterobranchus sp.</i>
Nile perch	Akwaabi	<i>Lates Niloticus</i>
African boney tongue	SuperKu	<i>Heterotis Niloticus.</i>
Atlantic mackerel	Saaman	<i>Scomber japonicus</i>
Horse mackerel	Kpanla	<i>Trachurus sp.</i>
Upside-down catfishes		<i>Synodontis spp.</i>
Characin	Asenti, Tewe	<i>Alestes spp.</i>
Silver catfish	Yalefo	<i>Bagrus spp.</i>
Herring	Amani	<i>Clupea harengus</i>
Tilapia	Apatre	<i>Oreochromis spp, Tilapine spp</i>
West African pygmy herring	One mouth thousand	<i>Sierathrissia spp.</i>
Anchovy	Nsesaawa	<i>Engraulis, encrasicolus</i>
Large head hairtail	onwanwa	<i>Trichiurus spp.</i>
Tuna	Tuna	<i>Katsuwonus pelamis</i>
Sardine	Amane sardine	<i>Sardinella spp.</i>
Sea Bream	Redfish	<i>Sparids spp.</i>
Cassava fish	Cassava fish	<i>Pseudotolithus senegalensis</i>
Barracuda	Odue	<i>Sphraeyna spp.</i>
European or Herring Hake		<i>Merluccius merluccius</i>

Appendix E

Table 4-6 displays selling prices for fish and meat gathered primarily from cold storage operators and owners from as many regions as possible.

Table 4. Prices of fish (in Cedis)

Market	Mackerel ⁴		Herring		Tilapia		Odue fish		Hake		cassava		redfish	
	Kg	Ctn	Kg	Ctn	Kg	Ctn	Kg	Ctn	Kg	Ctn	Kg	Ctn	Kg	Ctn
Bolgatanga	10	260 (30 kg)	8	220 (30 kg)	10	240 (20 kg)								
Tamale ⁵	10, 12 ⁶		8											
Tamale-Sakasaka/Wardk		260 (30 kg) 150 (20 kg)						450 (25 kg)						
Wa-Weziena cold store	9-13 ⁷ 10 ⁸	245-285 (30 kg), 180 (20 kg), 240- 280 (30 kg)	8	200 (30 kg), 180 ⁹ (30 kg)					14-15	145 (10 kg)				
Techiman-cold storage	10 ¹⁰ , 14 ¹¹	165-250/225									12	100	15	

⁴ Chub and horse mackerel, commonly referred to as “salmon.”

⁵ Lamashegu market

⁶ Horse mackerel

⁷ Horse mackerel

⁸ Chub mackerel

⁹ Sardines when they last sold it

¹⁰ Horse mackerel

¹¹ Chub/Atlantic mackerel

Table 5. Prices of Chicken

Market	Chicken back		Whole chicken		Chicken wings		Chicken thighs		Chicken gizzard	Chicken parts ¹²
	Lb	Ctn	Lb	Ctn	Lb	Ctn	Lb	Ctn	Lb	Lb
Bolgatanga	8	75 (10 kg)	15	115	11	100	12	115		
Tamale-Lamashegu							12-13			
Wa-Wezeina									8-15	8-12
Techiman-cold storage							11	102		

Table 6. Other meats/eggs prices

Market	Turkey wings		Beef		Goat		Eggs	Assorted intestines
	Lb	Ctn	Lb	Ctn	Lb	Ctn	Crate (30 pieces)	
Bolgatanga	15	160	8		9			
Tamale-Lamashegu			7-8					
Tamale ¹³			7-8		7		16-18	
Techiman-market			8-10		12			10

¹² Mix of parts¹³ Aboabo market