EUROPEAN UNION

POWER TO THE FISHERS PROJECT

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BASELINE STUDY REPORT

Developed by:

CERATH Development Organization:

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CERATH DEVELOPMENT ORGANISATION

Disclaimer

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ACRONYMS

CA	Conservation Alliance
CCM	Centre for Coastal Management
CDO	CERATH Development Organization
CR	Central Region
CSO	Civil Society Organization
CSO-RISE	Civil Society Organization in Research and Innovation for Sustainable Development
DA	District Assembly
EJF	Environmental Justice Foundation
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FC	Fisheries Commission
FoN	Friends of Nation
GNCFC	Ghana National Canoe Fishermen's Council
GoG	Government of Ghana
HM	Hen Mpoano
IUU	Illegal Unreported Unregulated
JHS	Junior High School
MA	Municipal Assembly
MCE	Municipal Chief Executive
MoFAD	Ministry of Fisheries and Aquaculture Development
MOU	Memorandum of Understanding
M&E	Monitoring and Evaluation
NGO	Non-Governmental Organization
NHIA	National Health Insurance Authority
NHIS	National Health Insurance Scheme
PTF	Power to the Fishers
SFMP	Sustainable Fisheries Management Project
SMEs	Small and Medium Enterprises
SNV	Netherlands Development Organization
SPS	Social Protection Service
UCC	University of Cape Coast
USAID	United States Agency for International Development
WR	Western Region

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENT

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A special thank you goes to each member of the Power to the Fishers project team.

And finally, we thank God for his guidance.

EXECUTIVE SUMMARY

Fishing is an important economic activity in Ghana operated by artisanal, small and large-scale fishers in marine and inland waters. The fishing sector plays a major role in nutrition, livelihoods support and poverty reduction in Ghana. However, due to significant overfishing, fish biomass has reached the lowest level since 1996. This decline in fish stocks has significant impacts on the fishing businesses and livelihoods of fisherfolks. Fish processors, who are mainly women have also had their livelihoods immensely affected. The European Union under the Civil Society Organization in Research and Innovation for Sustainable Development (CSO-RISE) Program, has committed funds for the implementation of Power to the Fishers Project; a project that aims at enhancing the socio-economic livelihoods of fishing communities within selected districts of the coastal savannah zones of Ghana. The Project contributes to the overall vision of the CSO-RISE through youth and women empowerment and community-based capacity building towards sustainable fishing and fish processing practices. CERATH Development Organization (CDO) has been selected to implement the 4-year Power to the Fishers Project in Ghana. CDO is a non-governmental organization that aims at empowering rural and urban poor communities in Ghana and West Africa. As part of the project's primary activities, CDO conducted a comprehensive baseline analysis of the fisheries sector of Ghana with specific attention on five main project districts – Shama, Gomoa West, Effutu, Ekumfi and Awutu Senya. The baseline study sought to collate, analyze and document the current state of fishing and fish processing activities in the project districts as a bench mark for the Power to Fishers Project. Using questionnaires and interview guides, a total of 1,888 respondents were interviewed for the study. The findings from the baseline study confirmed that, fishing is a male dominated business whereas females dominate the fish processing business. Other findings from the study revealed that, *sardinella aurita* was the dominant fish species harvested across the project areas. Data on fish pricing, subsidies on fishing inputs, general challenges in fishing, fish processing methods and techniques among others were also analyzed in this study. Further analysis went into income distribution in the fisheries business with the finding that, majority of beneficiaries earned between GHS100 to GHS250 (EUR 15.9 to EUR 39.76) weekly. From the baseline study, 42% of respondents believed that the recent closed season increased fish catch, 40% believed there were no impacts and 16% observed a reduction in fish catch. However, 2% were of the view that the closed season resulted in the landing of rare fish species. Health insurance, access to credit, and savings were the most preferred social protection packages to beneficiaries according to the baseline survey. Capacity building should be provided on business management and diversification so as to increase income levels and standard of living of beneficiaries. Advocacy programs should be organized to address issues related to knowledge gaps identified during the survey.

1.0 BACKGROUND

1.1 The Fisheries Sector in Context

Fishing is an important economic activity in Ghana, operated by artisanal, small and large-scale fishers in the marine and inland waters (FAO, 2016). The fishing sector plays a major role in nutrition, livelihoods support and poverty reduction in Ghana (SFMP, 2018). According to FAO (2016), fishing employs directly and indirectly an estimated 2.6 million men and women. It is noted that, men are more dominant in the fishing activity whiles women play more roles in fish processing and preservation activities (Torell *et al*., 2015). However, due to significant overfishing, fish biomass has reached the lowest level since the 1990s (Nunoo *et al*., 2015). The problem of fish stock decline therefore is critical for fishing communities in both coastal and lake zone areas, considering how dependent people's economic livelihoods are on fish availability. Factors contributing to fish decline include overcapacity, open access nature of the fisheries and illegal, unregulated and unreported (IUU), low compliance to fisheries regulations and weak governance mechanisms (Hen Mpoano, 2017).

Declining fish stocks may also have negative impacts on nutrition outcomes, given that fish are the single largest contributor to animal-source protein among Ghanaians. Fish is also a rich source of bioavailable micronutrients that are often lacking in the diets of low-income households (Bogard *et al*., 2017). Fish processors, who are mainly women, also have their livelihood deeply affected. These women's activities are very critical in the fisheries value chain as their role ensures fish preservation through processing methods such as fish smoking, frying, salting, freezing, among others (Sakyi *et al*., 2019).

Currently, fish smoking is the predominant means of processing fish in Ghana. Practically all species of fish available in the country can be smoked and it is estimated that 75% of the domestic marine and freshwater catch is processed by smoking. The fish smoking sector in Ghana is largely unregulated with various oven types and hygienic issues. The predominant ovens are highly energy inefficient with high volumes of smoke emissions (SNV, 2018). This is unsafe for both the environment and the health of the oven users, mostly women and children.

1.2 Power to the Fishers Project

The European Union under the Civil Society Organization in Research and Innovation for Sustainable Development (CSO-RISE) Program has committed funds for the implementation of "Power to the Fishers Project"; a four-year project that focuses on four main intervention areas; namely stakeholder

engagements for advocacy, promotion of efficient fish smoking technologies and fuels, capacity building on climate change mitigation and adaptation, and enhancing access to social protection services. The main goal of the project is to enhance the socio-economic livelihoods of fishing communities within selected districts of the coastal savannah zones of Ghana.

The project contributes to the overall vision of the Civil Society Organizations in Research and Innovation for Sustainable Development (CSO-RISE) through youth and women empowerment and community-based capacity building towards sustainable fishing and fish processing practices. More specifically and among others, the project will work to promote the adoption and use of modern fish smoking technologies in selected fishing communities, create awareness and facilitate the adoption of social protection services and contribute to knowledge by collaborating with research institutions to roll out several research programs in the fisheries sector.

CERATH Development Organization (CDO) has been selected to implement the 4-year Power to the Fishers Project in Ghana. CDO is a non-governmental organization that aims at empowering rural and urban poor communities in Ghana and West Africa. Its goals are executed through partnerships with relevant stakeholders. CDO also develops interventions aimed at enhancing agricultural productivity, providing support to the fishing industry, increasing access to renewable energy services to the rural communities, enhancing food security, and facilitating access to credit to the rural poor.

As part of the project's primary activities, CDO conducted a comprehensive baseline analysis of the fisheries sector in Ghana with specific attention on the five main project districts. The baseline has provided an overview of the current situation in the fisheries sector prior to CDO's intervention. The report below details the baseline study and findings.

1.3 Study Objectives

The primary objective of the baseline study was to collate, analyse and document the current state of fishing and fish processing activities in the project districts as a benchmark for the Power to Fishers Project.

Specifically, the study sought to:

- establish a baseline for the project to work with
- provide the basis for measuring changes in target districts
- obtain a better understanding of the current state of fisheries related activities in the target districts; and

- document the socioeconomic livelihood situation in the target districts.

2.0 METHODOLOGY

2.1 Overview of Project Districts

The project team in consultation with stakeholders, and also with reference to the coastal savannah areas delineated by the CSO-RISE program, selected five districts as project areas (Figure 1). The districts are Awutu Senya, Effutu, Ekumfi, Gomoa West and Shama. The first four districts are in the Central region, and the latter in the Western Region. Generally, fishers in these districts are involved in artisanal fishing and fish post-harvest activities.

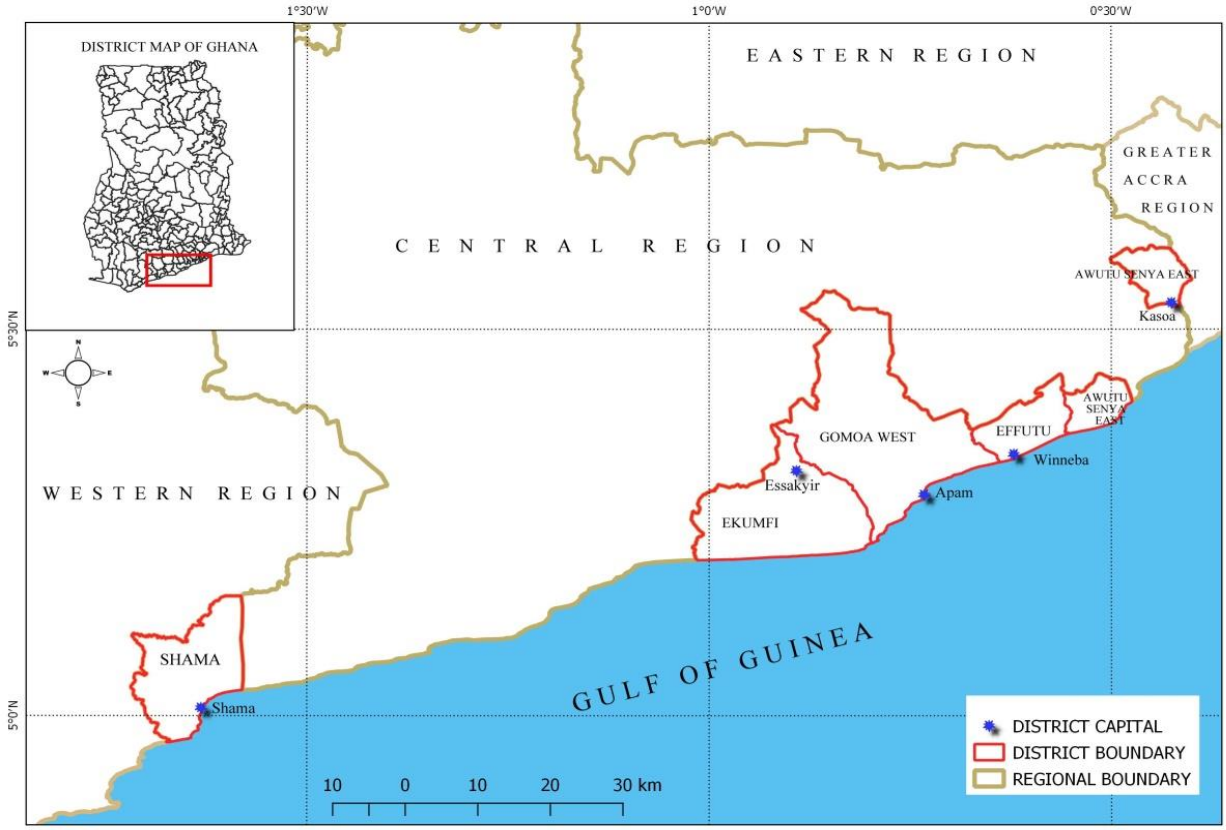

Figure 1: **Map showing the project districts**

2.1.1 Awutu Senya District

Awutu Senya District has only one coastal community – Senya Beraku. This district is noted for fishing because of the vibrancy and intensity of fishing activities in Senya Beraku. The artisanal fisheries sector accounts for a greater proportion of the working population in Senya Beraku rendering fishing activities as a colossal opportunity for the district. Inland fishing is yet to receive the needed attention despite the growing demand for fresh water fish especially Tilapia (MOFA, 2010).

2.1.2 Effutu Municipal

Marine fishing activity is carried out along the coast of Winneba, Esuakyir, Sankor, Woarabeba and Akosua Village within the Effutu Municipal area but very prominent in the coastal communities of Winneba, Akosua Village and Woarabeba (GSS, 2014). Winneba is noted to be the major coastal community as well as serve as its administrative capital. Primarily, the men in these coastal communities are vibrant in fishing whiles women play front role in fish processing predominantly, smoking and salting (Akutse and Samey, 2015). Some equipment used in fishing are outboard and non-outboard canoes, paddles, drift gill net, ring net, seine nets, *ali-poli-watsa,* hook and line, anchors, among others. The frequently harvested species are sardinella, mackerels, red fish, anchovy and tuna (Akutse and Samey, 2015).

2.1.3 Gomoa West District

The fisheries sector in Gomoa-West offers employment to over 10,000 people comprising fishermen, fish traders, fish processors and other support services (MoF, 2016). The five main fishing communities are Apam, Mumford, Dago, Mankoadze and Aberakum. The fisheries sector for this district has three (3) main areas of interest namely; marine fisheries, aquaculture and fish processing. Beach seining is a popular method used by fishers at Aberakum. A diversity of gears used in fishing expeditions include; trawl net, purse seine, ring nets, set nets, hook and line, drift gill nets, beach seines among others (MoF, 2016). Trading of fresh fish, fish processing and retailing are undertaken by most of the women. Notwithstanding, a few men also engage in processing activities which are smoking, salting, drying and frying (Akutse and Samey, 2015).

2.1.4 Shama District

Fishing is the driver of the local economy in Shama District (CRC and FON, 2010). The artisanal fishing industry of the district encompasses eight main coastal zones: Shama Apo, Shama Bentsir, Shama Amena

Ano, Anlo Beach, Aboadze, Abuesi, Kesewo Kan and Broni-Bema landing beach. However, Aboadze, Abuesi and Shama are the main landing beaches (GSS, 2014). Fishermen and fishmongers adopt several methods in harvesting, trading and processing fish. Estuarine fishing is also practiced with species such as tilapia, crabs, ponga fish and mudfish frequently captured (CRC and FON, 2010). Fishing inputs involved in expeditions are motorized and non-motorized canoes, paddles, premix fuel, ice blocks, anchors and anchor ropes, long line, hook and line, drift gill net, set net, cast net, beach seine and ali-poli-watsa nets (CRC and FON, 2010). Fishmongers, engage in trading and processing of fish in Shama District. Smoking, drying, salting and frying are the common fish processing methods practiced across the coastal zones of Shama District. A variety of fish processed by these methods include, burrito, cassava fish, lobsters, silver fish, sail fish, sardinellas, tuna, skipjack, jack mackerel, Atlantic bumper, shark and dolphin (CRC and FON, 2010).

2.1.5 Ekumfi District

In the Ekumfi District, fishing and its related activities are counted as one of the dominant livelihood activities carried out, especially in the coastal areas (GSS, 2014). Marine fishing is notably the predominant occupation of the inhabitants of the district. Sardinella is the dominant species landed in this district, especially during the peak fishing season (Akyempong *et al*., 2013).

2.2 Study approach

The study adopted two main approaches; interviews and survey. The interviews were carried out with relevant stakeholders and experts in the fisheries sector. The field survey was conducted using a structured questionnaire to acquire data on fishing activities in the project districts. The study was structured to cover the following:

i. Design of data collection forms – questionnaires and interview guides
ii. Reconnaissance and pre-testing of questionnaires and interview guides
iii. Finalizing questionnaires and interview guides for survey data collection
iv. Training of field staff on the questionnaire and data collection techniques
v. Sampling of respondents for interviewing
vi. Data collection: Interview of fish processors, fishermen, stakeholders and experts
vii. General observations and photo capture
viii. Data analysis and report preparation

2.3 Sampling Size & Technique

The sample size for the survey was computed at the community level. Using data on fisherfolk size obtained from Fisheries Commission (Dovlo *et al*., 2016), a sample size was calculated for each fishing community in the target districts. Total respondents from each category (fishermen and fish processors) were determined using the statistical sample size formula below;

$$n = \frac{c^2 N \rho_{(1-\rho)}}{(A^2 N) + (c^2 \rho_{(1-\rho)})}$$

Where:

n is the sample size required
N is the whole target population in question
p is the average proportion of records expected to meet the various criteria
(1-p) is the average proportion of records not expected to meet the criteria
A is the margin of error deemed to be acceptable (calculated as a proportion) e.g. for 5% error either way A = 0.05
c is a mathematical constant defined by the Confidence Interval

The sample size for the baseline study was determined to be a total of 1,888 respondents across the five districts. Convenience and purposive sampling technique were adopted for this research. Convenience sampling was used in selecting respondents in the target districts (fish processors and fishermen) whereas stakeholders and experts were purposively sampled for interview.

2.4 Study areas and respondents

The study was conducted in all five project districts: Awutu Senya, Effutu, Ekumfi, Gomoa West and Shama. The total survey respondents selected from these fishing communities were 387, 373, 377, 365 and 386 respectively disaggregated into fishermen and fishmongers as shown in Fig. 2. for the various districts.

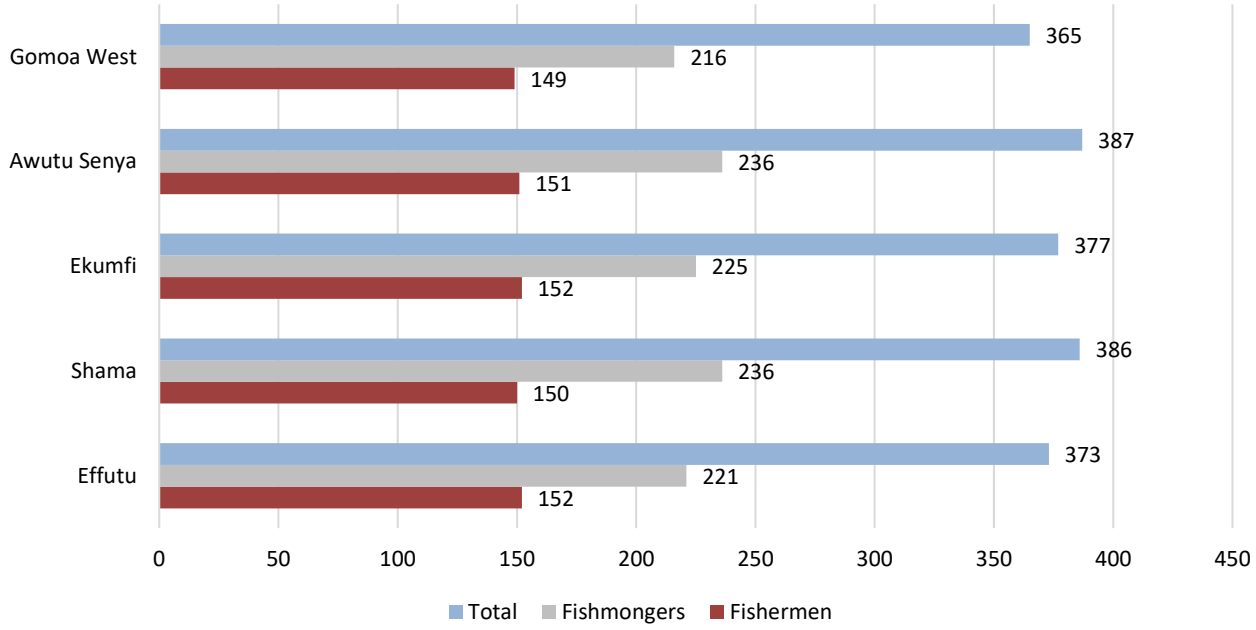

Figure 2: Respondent categories by district

2.4 Data Collection

Data collection exercise was carried out over three months from July to September, 2019. Both primary and secondary data were gathered for the study. Secondary data used included fisherfolk population data from Fisheries Commission (Dovlo *et al.*, 2016), and stove technology data from SNV Netherlands Development Organization (Kwarteng, 2014). The study also made use of both quantitative and qualitative data obtained using structured questionnaires. The questions were structured into the following nine segments:

1. Demography
2. Fishing Practices
3. Fish Processing
4. Fish Smoking Fuels
5. Income distribution
6. Perspectives on Closed Season
7. Knowledge on Climate Change
8. NGOs interventions
9. Social Protection Services in Fisheries

The total number and proportion of respondents in each category, the data type collected and from which project district is presented in the Table 1. The Table shows that, 59.7 % of the respondents were selected from the fish processors category, whereas 39.6% of the respondents were fishermen. Stakeholders and experts constituted only 0.7% of the respondents.

Table 1: Data type collected from the categories of respondents

Category of Respondent	Number of respondents	Percentage (%)	Data Type	District/Organization
Fish Processors	1134	59.7%	Socio-demographic profile, fish processing, fuel source and use, fish smoking associations, closed season, climate change, social protection services, business constraints, etc.	**Gomoa West:** Apam, Mumford, Abrekum, Mankoadze **Awutu Senya:** Senya Beraku **Ekumfi:** Otuam, Saafa, Immuna, Kontankore, Arkra, Ekumpoano, Narkwa, Asaafa, Odumaafa **Shama:** Anlo Beach, Shama Apo, Amenano, Bentsir, Kesewokan, Abuesi, Aboadze **Effutu:** Winneba, Akosua Village, Worabeba
Fishermen	754	39.6%	Socio-demographic profile, fishing inputs and equipment, fishing associations, closed season, climate change, social protection services, business constraints, etc	**Gomoa West:** Apam, Mumford, Abrekum, Mankoadze **Awutu Senya:** Senya Beraku **Ekumfi:** Otuam, Saafa, Immuna, Kontankore, Arkra, Ekumpoano, Narkwa, Asaafa, Odumaafa **Shama:** Anlo Beach, Shama Apo, Amenano, Bentsir, Kesewokan, Abuesi, Aboadze **Effutu:** Winneba, Akosua Village, Worabeba
Stakeholders/Experts	13	0.7%	Past and current interventions, state of the fishery sector, perspectives and challenges of the fishery sector, state of fisheries	Conservation Alliance, Friends of the Nation, SNV Netherlands Development Organization, Hen Mpoano, SFMP, Oxfam, Care, Friends of the Earth, Environmental Justice Foundation, Centre for Coastal

			regulations, closed season, social protection services	Management, Fisheries Commission/MOFAD Experts: Mr. Kofi Agbogah, Hen Mpoano Mr. Socrates Segbor, EJF Mr. Samuel Manu, Fisheries Commission

2.5 Data analysis

Data were analyzed descriptively and quantitatively using the Statistical Package for Social Sciences Version 20 (SPSS 20) and Microsoft Excel 2016 spread sheets. The data were cleaned and analyzed to derive the perspectives of fishermen and fish processors to estimate the state of fishing activities in the communities. District level analysis was also done to provide detailed information in line with project indicators. The analysis involved simple descriptive statistics such as averages and percentages. Graphs, tables or charts were used to visually present the results, where appropriate.

3.0 RESULTS AND DISCUSSION

This section presents findings from the survey presented in graphs, charts and tables with discussions provided.

3.1 Demography

A total of 1,888 respondents were interviewed in the survey with a composition of approximately 60% females and 40% males. All the 60% female respondents were fish processors, whereas all the 40% male respondents were fishermen. This gives a clear indication of the sharp gender disaggregation when it comes to fishing and fish processing activities. It was also identified that, over half of the respondents (55%) had no formal education whiles about 38.6% had some level of basic education. About 6.4% respondents had secondary education and above (Fig. 3).

The results also showed that, 52% of the respondents were between the age range of 31-50 years, indicating that the dominant workforce is within this range of age (Fig. 3). On marital status, 78.8% were married, 6.5%were divorced, and 8.6% were widows implying that the majority of the fisherfolk in the 5 districts are married. Figures 3-5 confirm the demographic characteristics of the respondents.

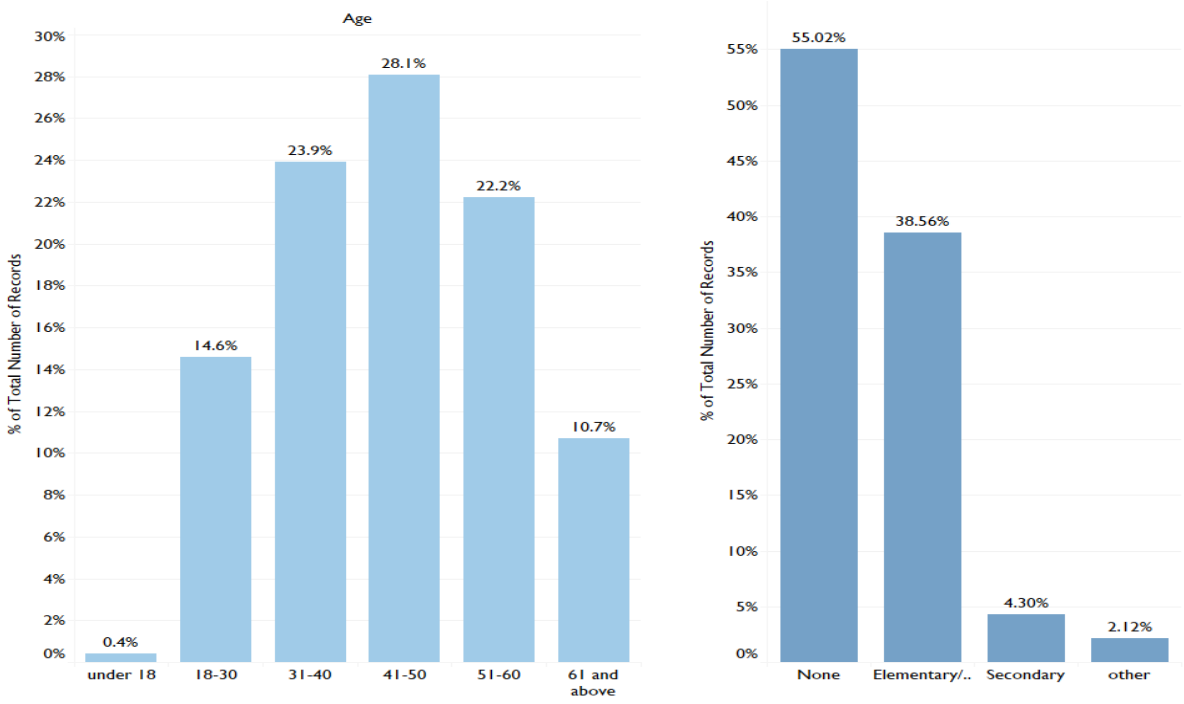

Figure 3: Age structure and educational level of the respondents

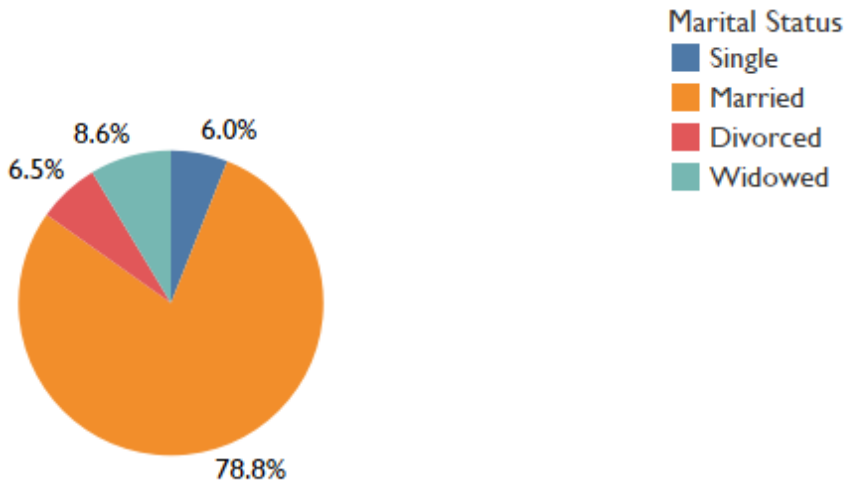

Figure 4: Marital status of fisherfolk

3.1.1 Demographic Characteristics of Project Districts

The research revealed that, respondents from Shama District were the most educated fisherfolk followed by respondents from the Effutu Municipal area. Respondents from Awutu Senya District were found to be the least educated. It was also realized that, the dominant workforce within the Effutu, Ekumfi, and Awutu Senya Districts was within the age range of 41-50 years whereas in Gomoa and Shama Districts, the dominant workforce was within the age range 31-40 years (Fig. 5). This implies that, the youth are more employed and dominate the working force of Gomoa and Shama Districts.

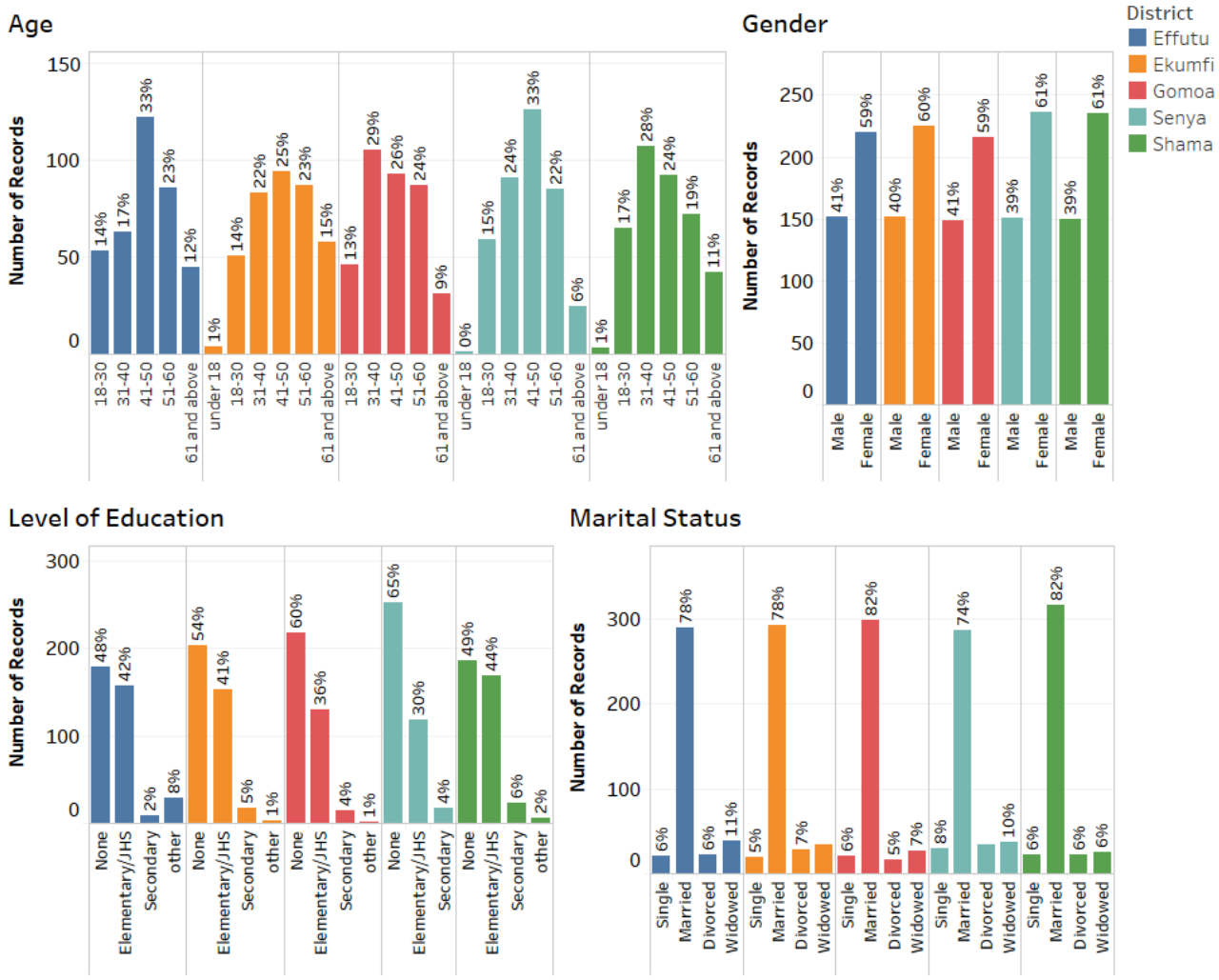

Figure 5: Demography of fisherfolk

3.1.2 Supplementary Livelihoods in the Fisheries Sector

To fully understand the livelihood options for respondents (fisherfolk), a question was set to verify if respondents had any additional or supplementary livelihoods that provided them with additional income. The result showed that, majority of the respondents (65.8%) depended solely on fishing activities for their livelihood. The remaining 34.2% had additional livelihood options to depend on (Fig. 6). These supplementary livelihoods included petty trading (17.4%), services (6.5%), artisanship (5.2%), and farming (5.0%). 'Services' included occupations such as: driving, teaching, boat repairing and mobile money vending.

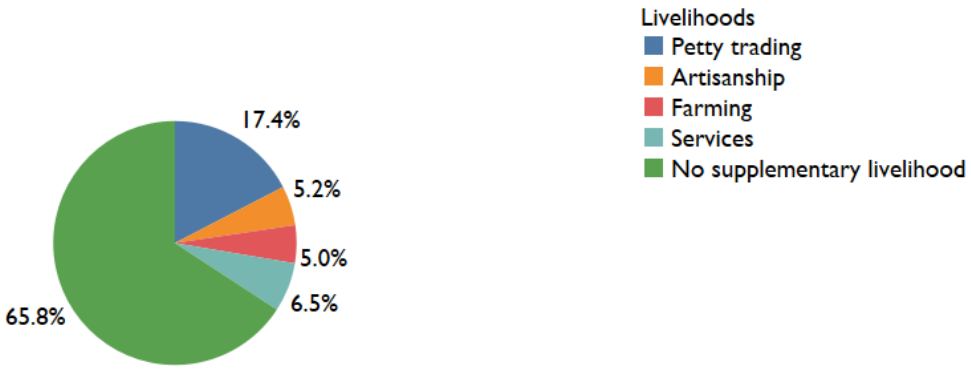

Figure 6: Supplementary livelihood of fisherfolk

3.2 Fishing Practices

This section looks at the current fishing activities and practices in the project districts. Respondents for this component were mainly fishermen with fishing being their main occupation. Artisanal fishing is mostly carried out with a crew comprising captains, secretary, jumper, engineer among others, all operating in one canoe. Findings from this research indicated that, 52% of the fishermen interviewed owned a canoe. Also, 85% of the fishermen used canoes equipped with outboard motors, whereas 11% had canoes without outboard motors. The remaining fishermen (4%) used industrial boats for fishing. The popular fishing nets identified were Ali-Poli-Watsa (40%), Set-Net (40%), Beach Seine (10%), Purse Seine-Net (5%), Hook & Line (4%), Drift gillnet (1%).

Respondents' knowledge on subsidies were explored and their opinions on the impacts of these subsidies on the fisheries sector were also sought. The findings indicated that, respondents (59%) were aware of the existence of government of Ghana's (GoG) subsidies on fishing inputs while 41% were not aware of these subsidies. The district analysis showed that, fishermen in Effutu municipal area were more aware of the government of Ghana (GoG) subsidies than the other districts. Awutu Senya District had very little awareness on the GoG's provisions on subsidies (Fig. 7). Overall, fishermen were more aware of subsidies on premix fuel than any other fishing inputs.

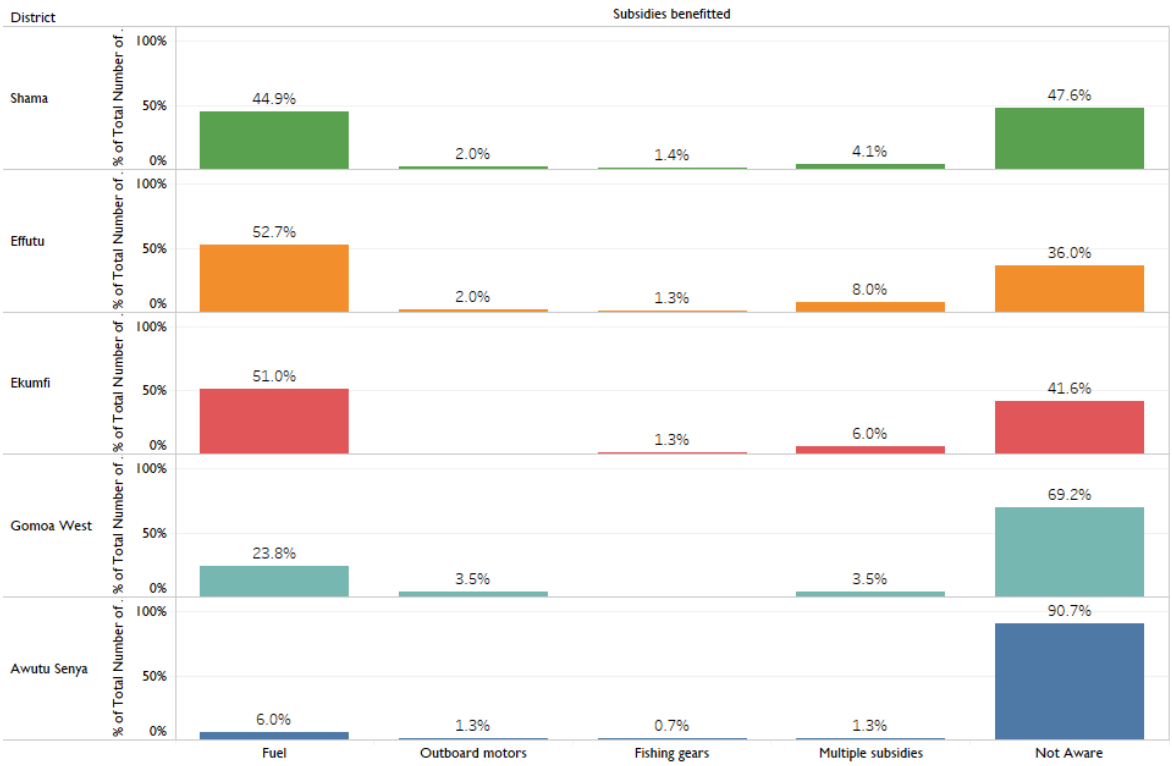

Figure 7: Subsidies benefitted by fishermen in the selected Districts

3.2.1 Beneficiaries Perception on GoG subsidies

The government of Ghana provides subsidies on fuel, outboard motors and some fishing gears. As much as some beneficiaries are aware and understand that, the subsidies are intended to support the growth of the fisheries industry, the findings indicated that, accessibility to these provisions were a major challenge. Respondents attributed this challenge to corruption and political influence (32.2%), demand and supply disparities (23.4%) and lack of information on the provisions (44.4%) as shown in Figure 8.

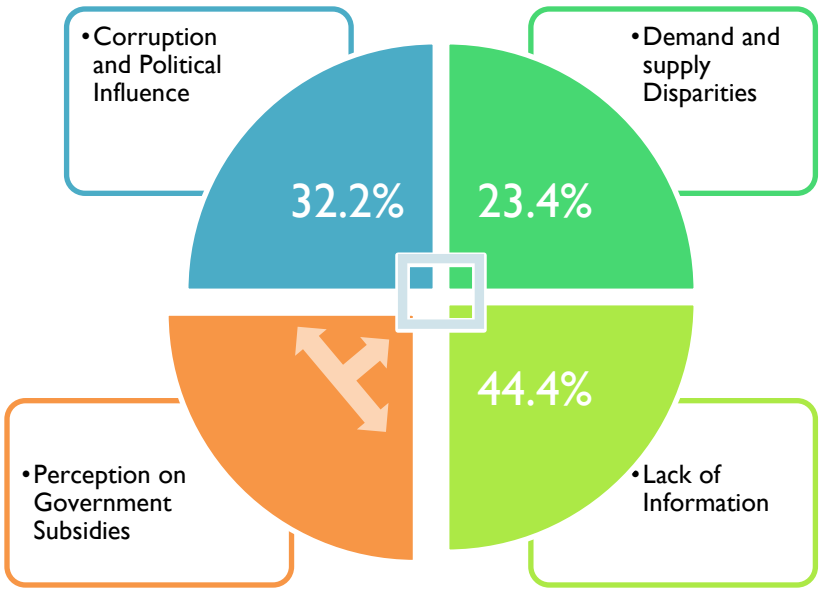

Figure 8: Fishermens' perception of government subsidies

In spite of the outlined challenges, 82% of the respondents wanted the GoG to maintain the subsidies on fishing inputs. However, 12% of respondents were of the opinion that, the subsidies on fishing inputs should be scrapped. They were of the opinion that, if the subsidies were scraped, the associated corruption would decrease and fishing inputs availability might increase. The remaining 6% of the respondents were indifferent.

The general challenges associated with fishing businesses were also assessed. This chart (Figure 9) shows the common challenges fishermen face in their line of work. These challenges included: Access to equipment, finance, affordable fuel, information on Illegal, Unreported and Unregulated (IUU) fishing practices. These challenges affect the sustainability and productivity of the fishing business. From Fig. 9, poor access to affordable fuel was the major concern of most fishermen (29%). A fisherman said, "we always run at a loss due to the intercepted price of fuel". This is often referred to as "Kalabule" in the local parlance. Some fishermen also asserted that some of their fishing methods such as light fishing pose a serious threat to sustainable fisheries management.

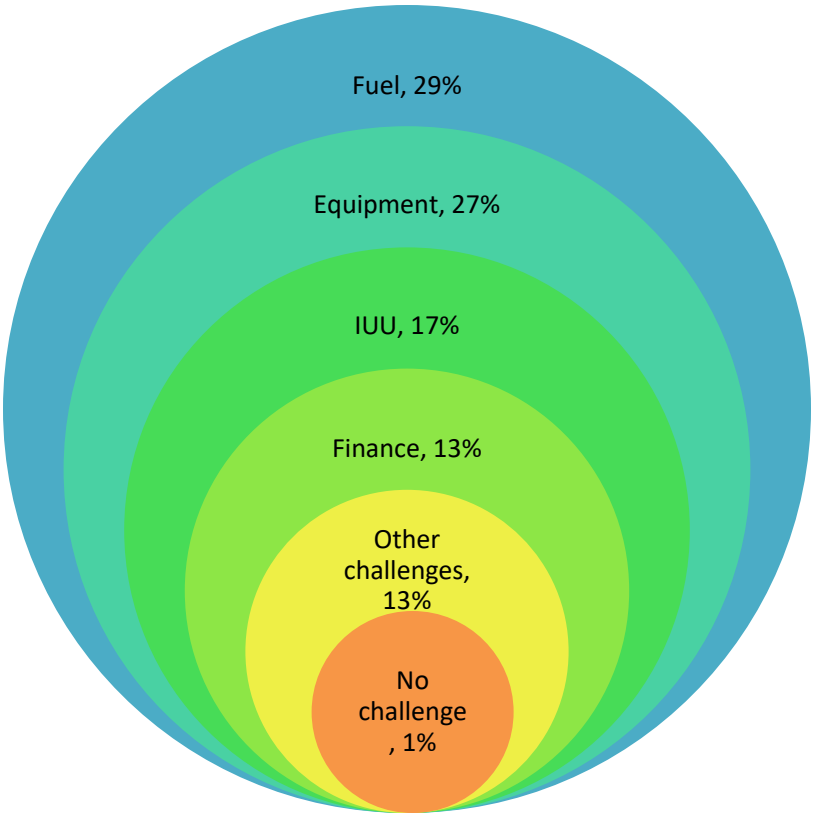

Figure 9: Common challenges faced by fishermen

3.2.2 Financing Fishing Expedition

Every fishing expedition requires quite a significant amount of financial investment. The money is mostly used to purchase fuel for the canoe and food for fishing crew. The study also confirmed that, 61% of fishing expedition is self-financed. About 19.4% of fishermen who do not own canoe depend on canoe owners to finance their fishing expeditions (Fig. 10). It was also recorded that, about 16.4% of fishing expeditions are financed by "fish mothers"/ fresh fish traders who are mostly women. A minority (4.1%) of respondents said they operate a more organized system where the group sets aside fund for these purposes. They refer to this sort of arrangement as "company financing".

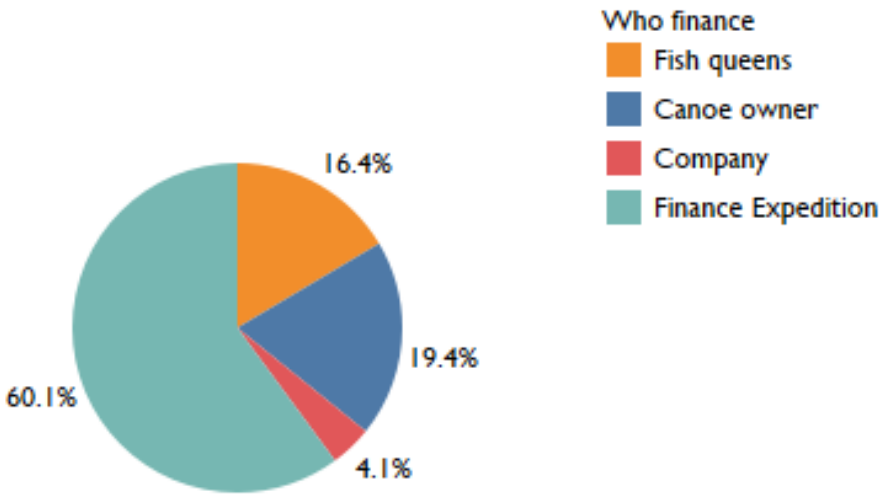

Figure 10: Financing of fishing expeditions

3.2.3 Price Setting for Fresh Fish

Pricing of fresh fish is a critical profit/loss determinant for both the fishing and fish processing businesses and therefore requires a very good price management system. Low pricing affects the income of the fisherman as much as high pricing has significant negative impacts on the fish processing business. The baseline researched into factors that influence price setting in the various landing beaches. It was learnt that; a number of factors are considered by both parties (fisherman & fish processor) before the price of fish is decided. Fish prices at the landing beach are greatly dependent on species type and fish size, fish quality, cost incurred during expedition, prevailing market price and fish availability.

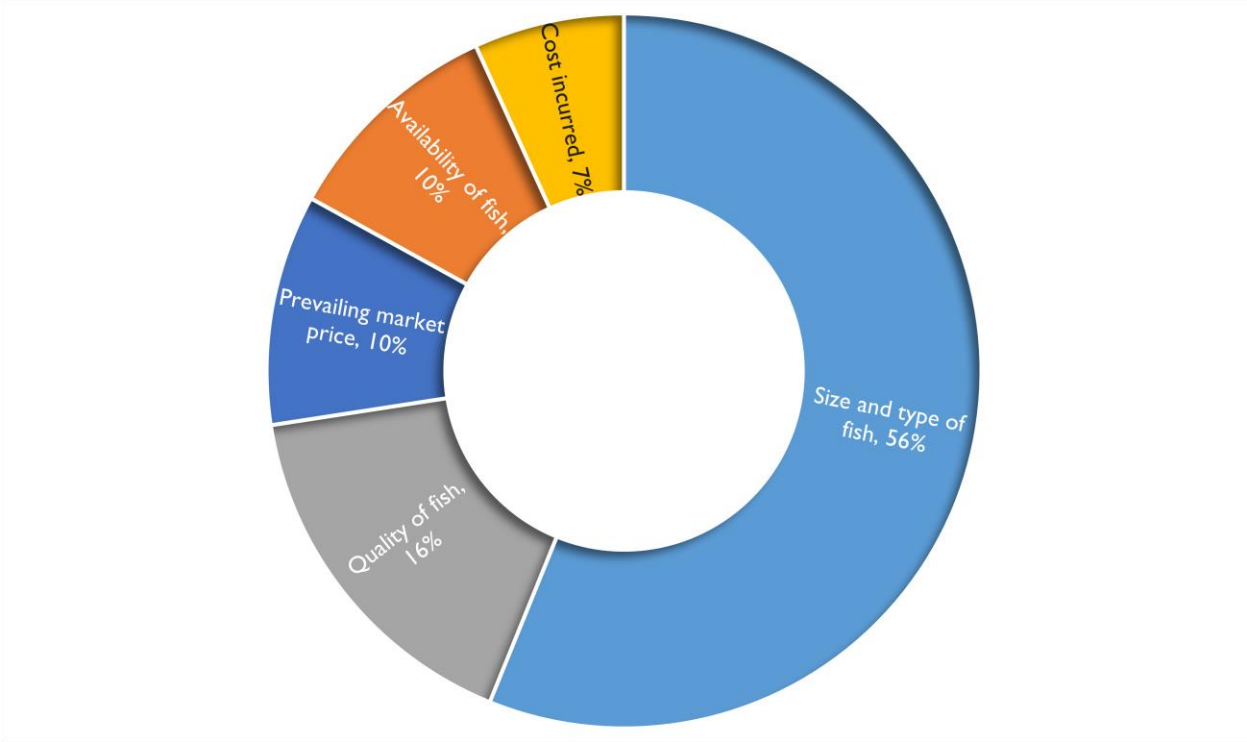

Figure 11: Factors informing price setting of fish landed

From Fig. 11, 56% of the fisherfolk consider the size and species type of fish as the most important determinants of prices of fish. Quality of fish is another important factor constituting 16%. Surprisingly, despite identifying financing as a challenge in the coastal areas, cost incurred is the least factor (7%) considered in the setting of price of fish landed.

Analyzing the perspectives of the fishermen and fish processors, it was realized that, although these two groups have approximately the same level of consideration for all the factors that influence fresh fish price, fish processors pay more attention to the fish quality than the fishermen (see Figure12). This is because fish processors make more profit from fish of higher quality. On the other hand, fishermen take advantage of fish availability to influence fish pricing.

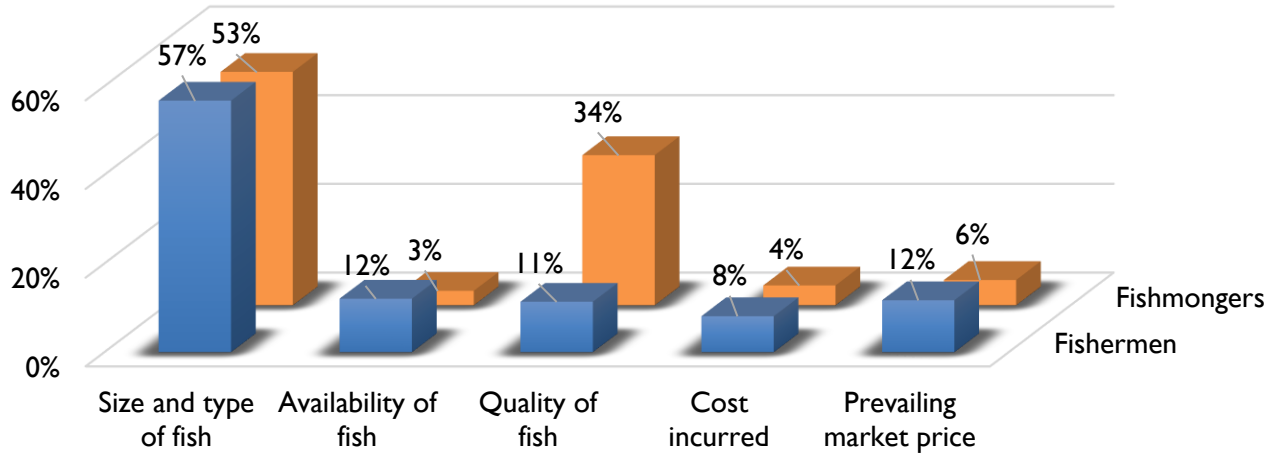

Figure 12: Factors informing price setting of fish landed (Fisherfolks)

3.3 Common Fish Species Landed in Project Districts

The study sought to understand the common fish species landed in the project districts. It was realized that quite a number of different fish species were landed at different times. Various species have different seasons of harvest. The dominant fish species across the project districts were identified to be *Sardinella* spp. (35%), *Thunnini* spp. (18%), *Scomber* spp. (16%), *Engraulis encrasicolus* (6%) among other species (Figure 13). Additional information on the percentage composition by weight of fish species commonly landed in each district is provided in Table 2.

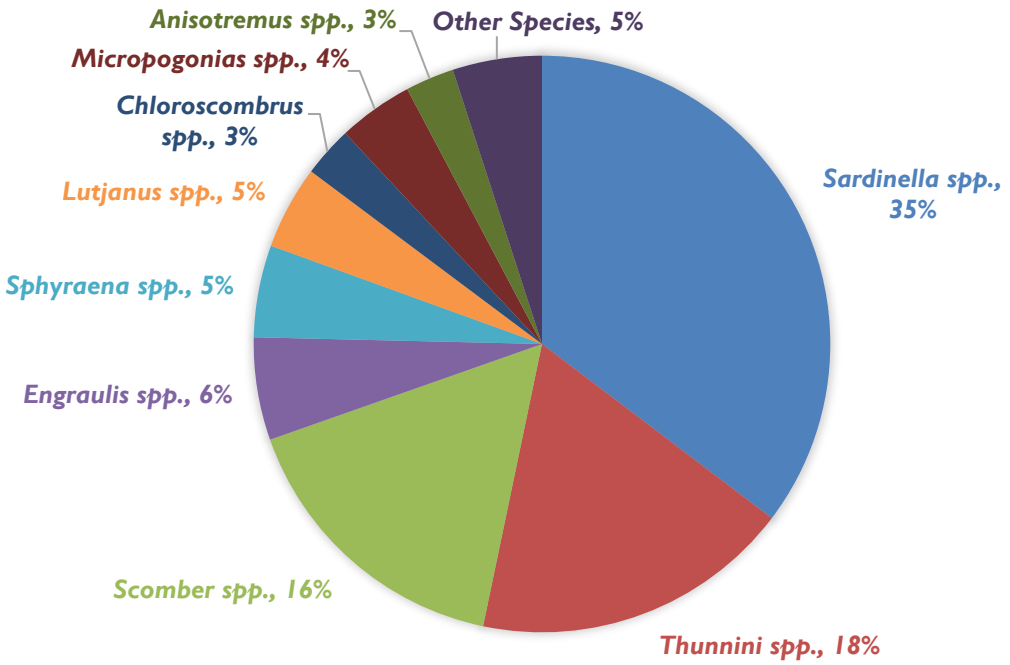

Figure 13: Common fish species landed

Table 2: Common fish species landed across the districts

Awutu Senya	Effutu	Ekumfi	Gomoa West	Shama
Sardinella spp. (33%)	*Sardinella spp* (32%)	*Sardinella spp.* (33%)	*Sardinella spp.* (41%)	*Sardinella spp.* (39%)
Scomber spp. (32%)	*Thunnini spp.* (20%)	*Sphyraena spp.* (13%)	*Thunnini spp.* (14%)	*Thunnini spp.* (19%)
Thunnini spp. (26%)	*Scomber spp.* (19%)	*Scomber spp.* (9%)	*Scomber spp.* (14%)	*Engraulis spp.* (9%)
Engraulis spp (7%)	*Lutjanus spp.* (7%)	*Thunnini spp.* (8%)	*Micropogonias spp.* (7%)	*Scomber spp.* (6%)
Other Species (2%)	*Engraulis spp.* (6%)	*Lutjanus spp.* (8%)	*Lutjanus spp.* (6%)	*Chloroscombrus spp.* (6%)
	Sphyraena spp. (4%)	*Anisotremus spp.* (7%)	*Engraulis spp.* (5%)	*Micropogonias spp.* (5%)
	Micropogonias spp. (3%)	*Micropogonias spp.* (6%)	*Sphyraena spp.* (4%)	*Sphyraena spp.* (4%)
	Pandalidae spp. (3%)	*Chloroscombrus spp.* (4%)	Other Species (9%)	*Anisotremus spp.* (4%)
	Chloroscombrus spp. (3%)	*Anguilliformes spp.* (4%)		Other Species (8%)
	Other Species (3%)	Other Species (8%)		

3.4 Post-Harvest Fish Processing

Fish post-harvest processing includes every activity carried out beginning from the moment fish is caught or harvested through to when the fish is ready to be consumed (net to plate). This part of the value chain comprises actors dominated by women playing different key roles. The major actors include; fish mothers, fish processors, smoked fish traders and smoked fish retailers.

3.4.1 The role of the Fish Mother – Fresh Fish Traders

The fish mother plays a pivotal role in the fisheries value chain. They are very influential as they tend to control the fishing transition from the fishermen to the fish processor. Some of them own canoes or have the necessary resources to finance fishing expeditions. Those who own canoes employ fisher crew and controls the whole fishing expedition. Fish mothers serve as an intermediary between the fishermen and fish processor and therefore play a key role in price determination at the landing beach. They sometimes double as fish processors. Out of the total 1,134 fishmongers interviewed, 68 of them were "fish mothers" representing 6% of the total fishmongers and 43% of these "fish mothers" had been financing fishing expeditions. Also, it was realized that, 92% of fish mothers finance fishing expeditions from their own pockets.

The study also showed that a number "fish mothers" encountered challenges in their line of work. The challenges were found to be linked to sourcing of fish from fishermen (Figure 14). Twenty-seven (27%) of "fish mothers" viewed the prices of fish as a major challenge while other challenges included credit issues, fish quality and surprisingly cheating and dishonesty on the side of some fishermen.

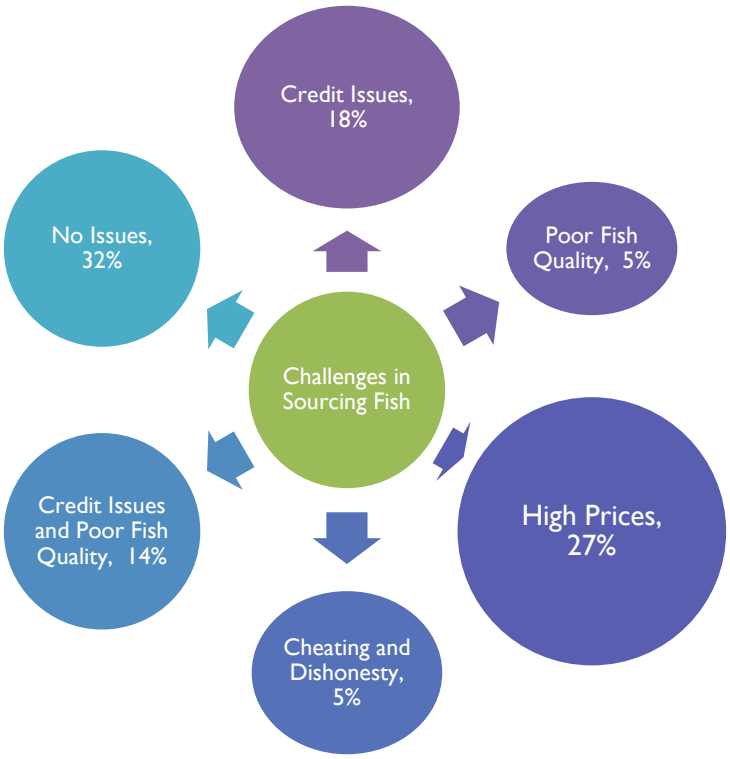

Figure 14: Challenges in sourcing fish by "fish mothers"

3.4.2 Fish Processing

Fish processors are the actors in the value chain responsible for converting the fresh fish into different forms of fish food for consumption. They preserve fresh fish using different processing techniques which include salting, frying, drying and smoking being the dominant method (Fig. 15). This category of the fisheries value chain provides the largest employment for women. The chart (Fig. 15) shows the distribution of fish processing methods used by the fish processors in the study districts. The study shows that 83% of fish processors adopt the fish smoking method only. Other processing methods included salting (3%), sun drying (3%), and frying (1%). It was also revealed that some fish processors practice more than one method such as smoking and salting, smoking and frying, and smoking and sun drying.

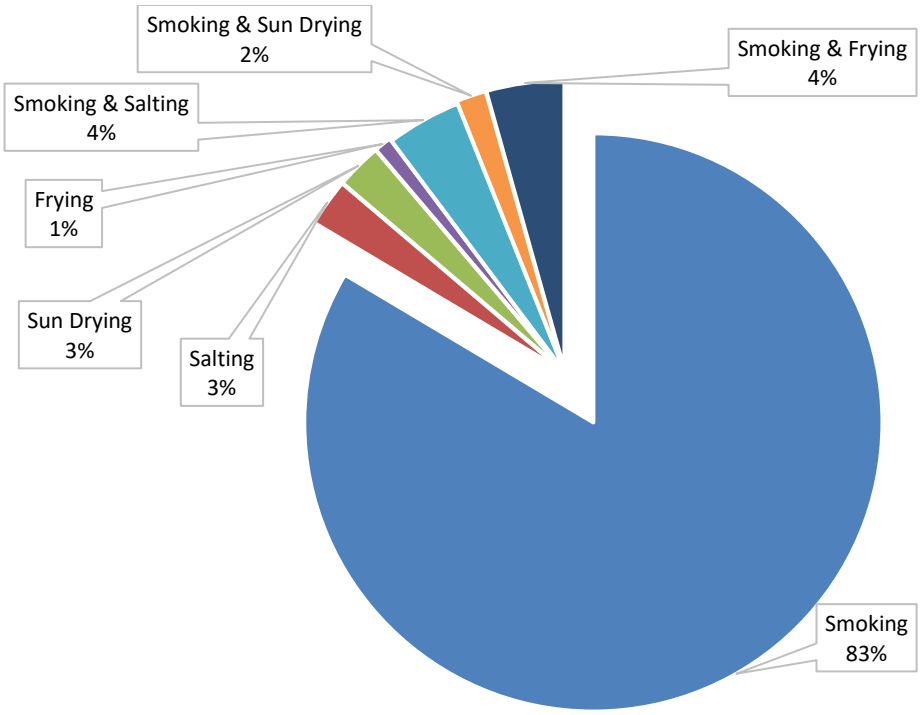

Figure 15: Methods of processing fish by fish processors

3.4.3 Fish Smoking

With the project's distinct focus on fish smoking, the baseline researched deeper into the activities, inputs and challenges associated with this business. The study sought to verify the average number of fish smoking ovens owned by fish processors and the quantities of fish processed across the study districts. Also, the quantity of fish smoked was analyzed to give an indication of the fish smoking capacity per district (Table 3).

Table 3: Quantity of fish processed

Districts	Average Pans of Fish during	
	Bumper Season	**Lean Season**
Effutu	12	4
Ekumfi	16	4
Gomoa West	11	3
Awutu Senya	22	8
Shama	15	5

Table 3 shows the average number of pans processed by a fish processor during the bumper and lean seasons. Awutu Senya recorded higher average number of pans of about 22 pans in a bumper season with 8 pans during the lean season. The least number of pans processed is recorded by Gomoa West with 11 pans during the bumper season and 3 pans during the lean season.

Table 4 provides details on the number of fish smoking ovens in the district. Shama district recorded the highest number of ovens with Awutu Senya recording the least estimated number of ovens (Table 4).

Table 4: Number of ovens across the study districts

District	Recorded ovens	Average number of ovens
Shama	1156	4.9
Effutu	625	2.8
Ekumfi	774	3.4
Gomoa West	759	3.5
Awutu Senya	792	3.4

3.5 Fish Smoking Technologies & Fuels

Four different types of fish smoking technologies were identified and counted under this research. These technologies included; *Chorkor* oven, *Ahotor* oven, Cylindrical/rectangular mud oven and the Cylindrical/rectangular metal oven. The data analysis revealed that, the most widely built oven is the *Chorkor* oven recording 79.4% of ovens use in the target districts. The *Cylindrical/Rectangular mud* oven comes second with 10.1%. The *Ahotor* oven which is the newly introduced fish smoking technology had 5.4% counts in the target district. Figure 16 shows the frequency count of the types of ovens used in the districts

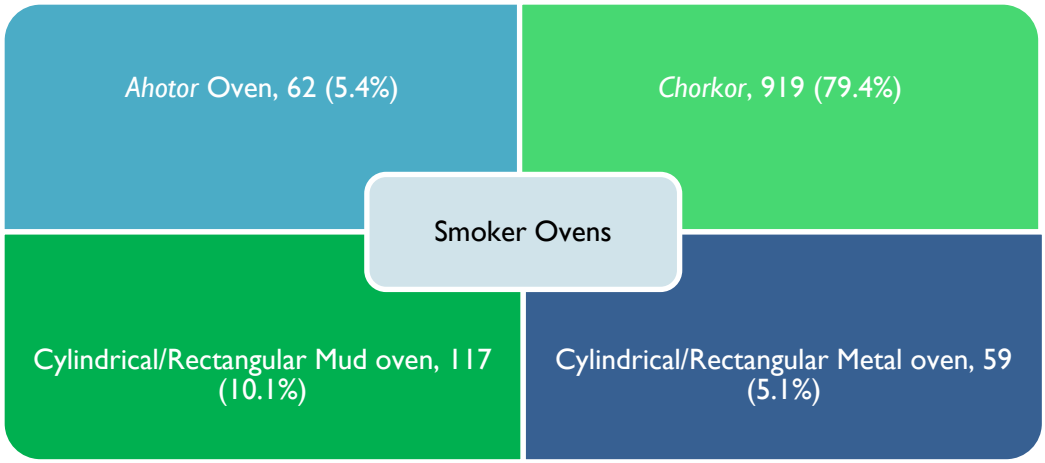

Figure 16: Number/Percentage of oven types used by fish processors

A minority (7%) of fish processors did not own fish smoking ovens and therefore depended on external sources for their fish smoking activities. The research further verified how they access stoves for their business. It was realized that, 56% of them utilized the "pay as you go" ovens, 29% use open access ovens without any payment and 15% use family-owned ovens. (Figure 17).

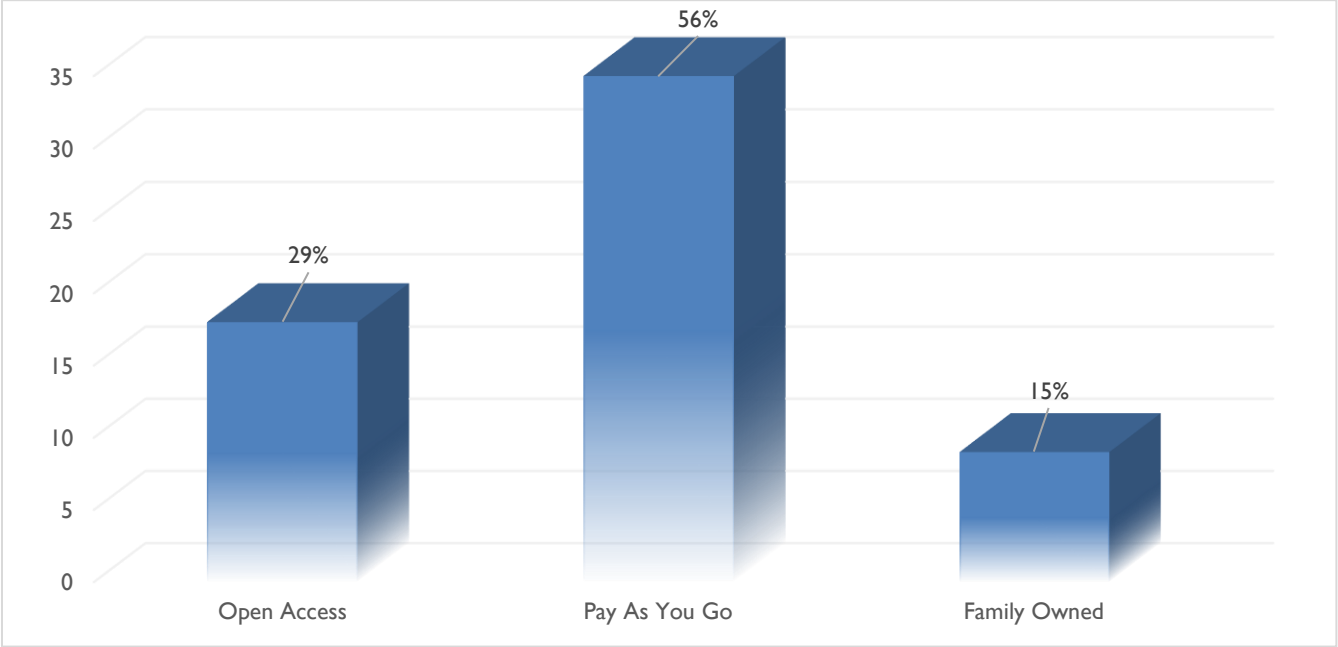

Figure 17: Utilization of ovens by processors who do not own an oven

3.5.1 Fuel for Fish Smoking

Another important input for fish smoking business is the source of energy or fuel for processing. The fuel type used mostly depend on the stove technology design. The dominant fish smoking technologies available in Ghana utilize fuelwood as the primary source of energy. To ascertain this fact, the baseline explored the fuels utilized by fish processors for fish smoking. It was realized that, fish processors mostly prefer using mainly fuelwood (62% utilize only fuelwood) for fish smoking, 4% use only coconut husk for processing fish. Meanwhile, 25% of fish processors utilize both fuelwood and coconut husk as fuel. Some processors estimated at 8% utilize a combination of fuelwood, coconut husk and sugarcane bagasse. Figure 18 provides details of the findings.

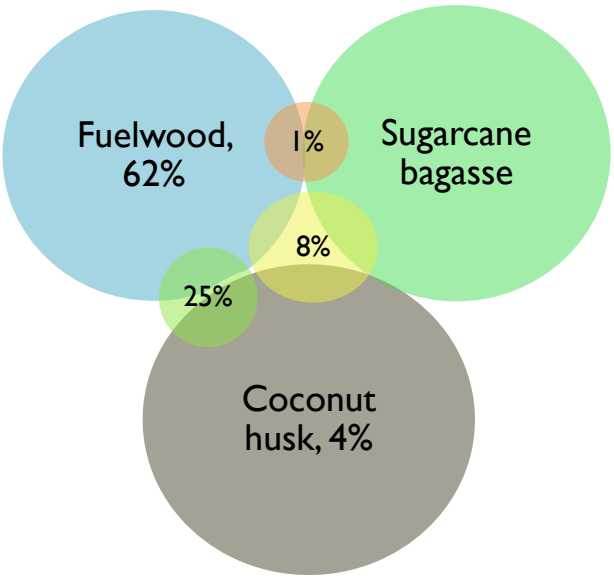

Figure 18: Fuel types used by fish processors

3.5.2 Sources of Fuels

Energy/fuel is a critical input for fishing smoking. Good preservation culture of fuel source is very important for sustainability. The baseline study therefore sought to verify where the fuels were sourced and the findings are provided (Fig. 18). The chart shows the source of fuel used by fish processors at the district level. Clearly most of the fish processors purchase their fuel from dealers while a few self-harvest their fuel. Self-harvesting of fuel is done from nearby vegetation (69.3%), forest resource/woodlot (28.3%) and mangrove (2.4%).

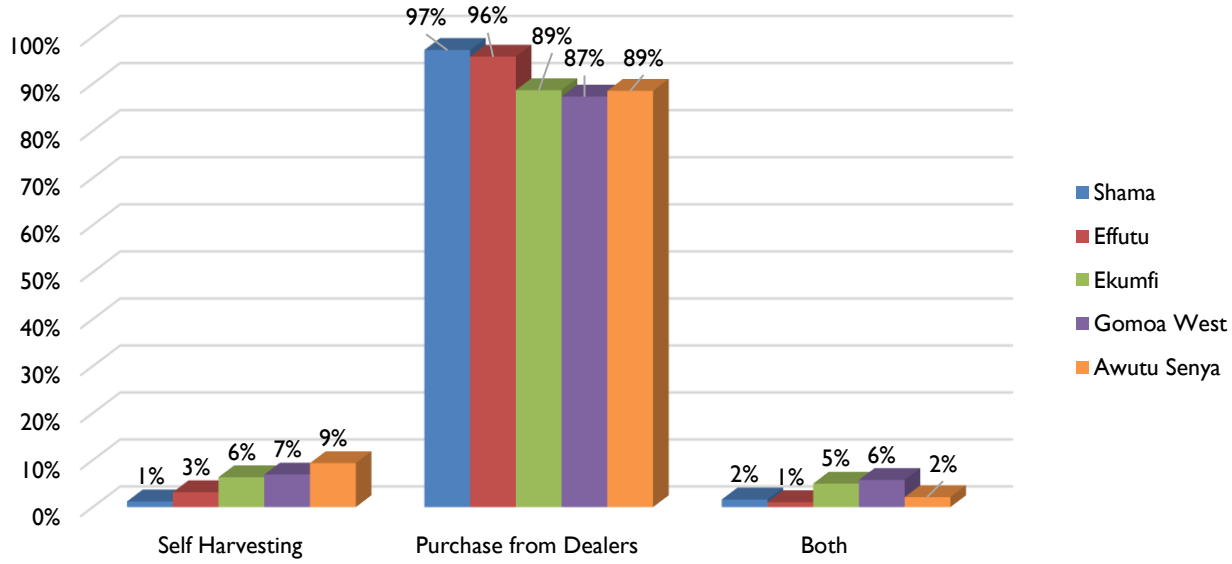

Figure 19: Sources of fuel for processing fish

3.5.3 Segmentation of Fisherfolks by Income

As part of the socio-economic livelihood's enhancement strategy, the project will provide capacity building on small enterprise management as a way to increase beneficiaries knowledge on business management. This is to ensure sustainability and increased income. Therefore, the current income status of beneficiaries was investigated to give an indication of how segmented the fishing businesses were.

According to the analysis, data on income for fish processors is quite close to normality (symmetrical), which is steeper at both ends and more distributed in between the lowest income and highest income. From the Chart (see Figure 19) it can be interpreted that, 11.6% of fish processors earn an income of GHS 50 and below and 10.1% earning above GHS 500. However, more fish processors earn income between GHS 50 and GHS 500. The National Daily Minimum Wage (NDMW) is currently GHS 11.82, which is approximately GHS 82.74 per week. From the distribution, 17% of fish processors earn income below the minimum wage.

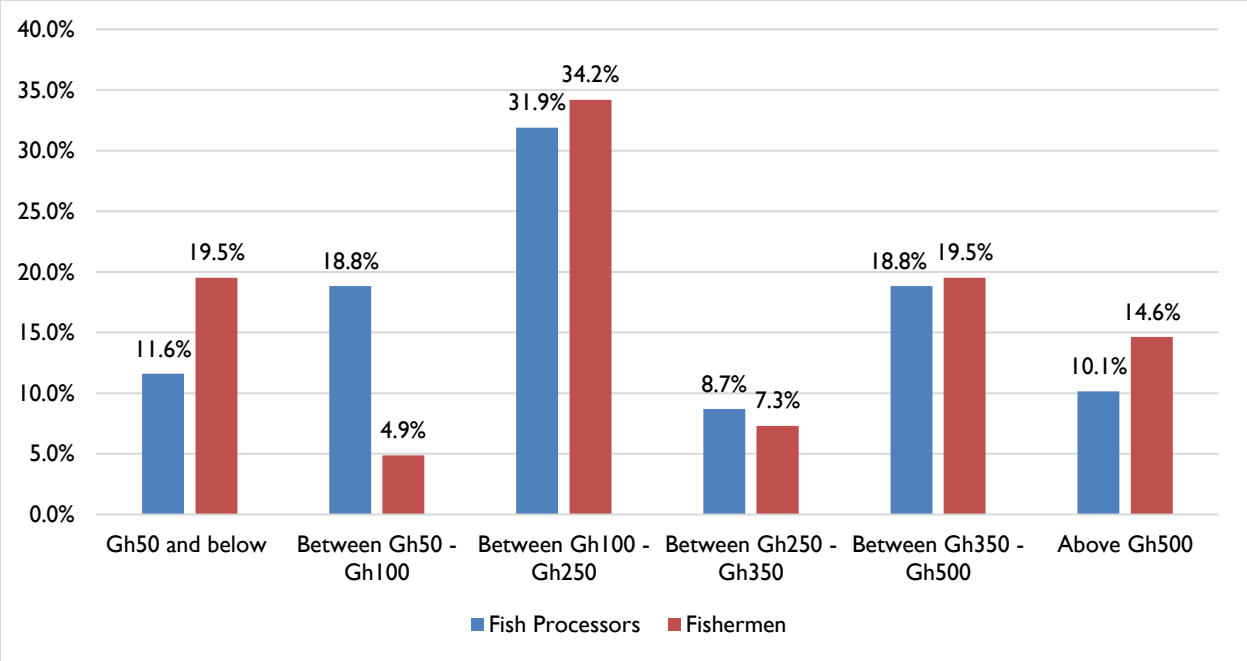

Figure 20: Segmentation of fisherfolk by income

Analysis also indicated that, majority (34.2%) of them earn between GHS100 to GHS250 in a week. 19.5% of fishermen have an average income of GHS50 or below whiles 14.6% earn an average income of GHS500 and above. Also 20% earn below the minimum wage of about GHS82.74 a week.

3.6 Perspectives on Closed Season in Artisanal Fisheries

As part of the initiatives to rebuild the marine fisheries stock and enhance fisheries sustainability management, the government of Ghana through the Ministry of Fisheries and Aquaculture Development is implementing a closed season policy in the marine fisheries sector. The policy implementation for the artisanal sector begun for the first time from May 15 to June 15, 2019. During this closed season period, all fishing activities on the ocean were restricted. Through this baseline study, the project investigated into fisherfolks' viewpoint on the closed season and its impact on their businesses and livelihoods. Specifically, the study assessed fisherfolks independent views on the closed season as whether beneficial or not and also evaluated their observations on fish catch levels after the closed season. Correspondingly, the study researched into other economic livelihood activities fisherfolks engaged in during the closed season.

The research revealed that, every fisherfolk interviewed observed fully the closed season. However, 3% of fishermen migrated to neighboring countries to engage in fishing. Also, 0.3% of fish processors migrated during the closed season.

3.6.1 Assessment of Closed Season Benefits to Fisherfolks

Figure 21 is the assessment of fisherfolks' perception on whether the closed season was beneficial or not. The views of the fisher folks were recorded as whether they agree or disagree to the closed season being beneficial. From the study we found out that, 43% of fisher folks agreed that the closed season was beneficial and 45% of them disagreed to the closed season being beneficial. However, 12% of the respondent were indifferent, they had no opinion as to closed season was beneficial or not.

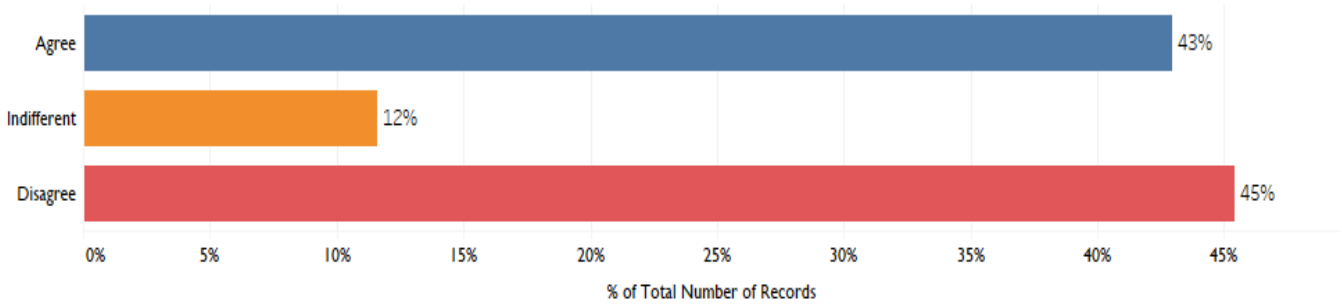

Figure 21: Perception of importance of the closed season

3.6.2 Impact of Closed Season on Fish Catch

The baseline sought to find out if the closed season had any observed impact on fish catch after the resumption. Generally, the impact of the closed season had approximately an average opinion from the fisherfolks. The Figure 22 show the fisherfolk's assessment of the impact of the closed season on fish catch. 42% of respondents believed that the closed season increased fish catch whiles 40% believed there were no impact from the closed season on fish catch. However, 16% of respondent reported that, the closed season has rather caused a reduction in fish catch.

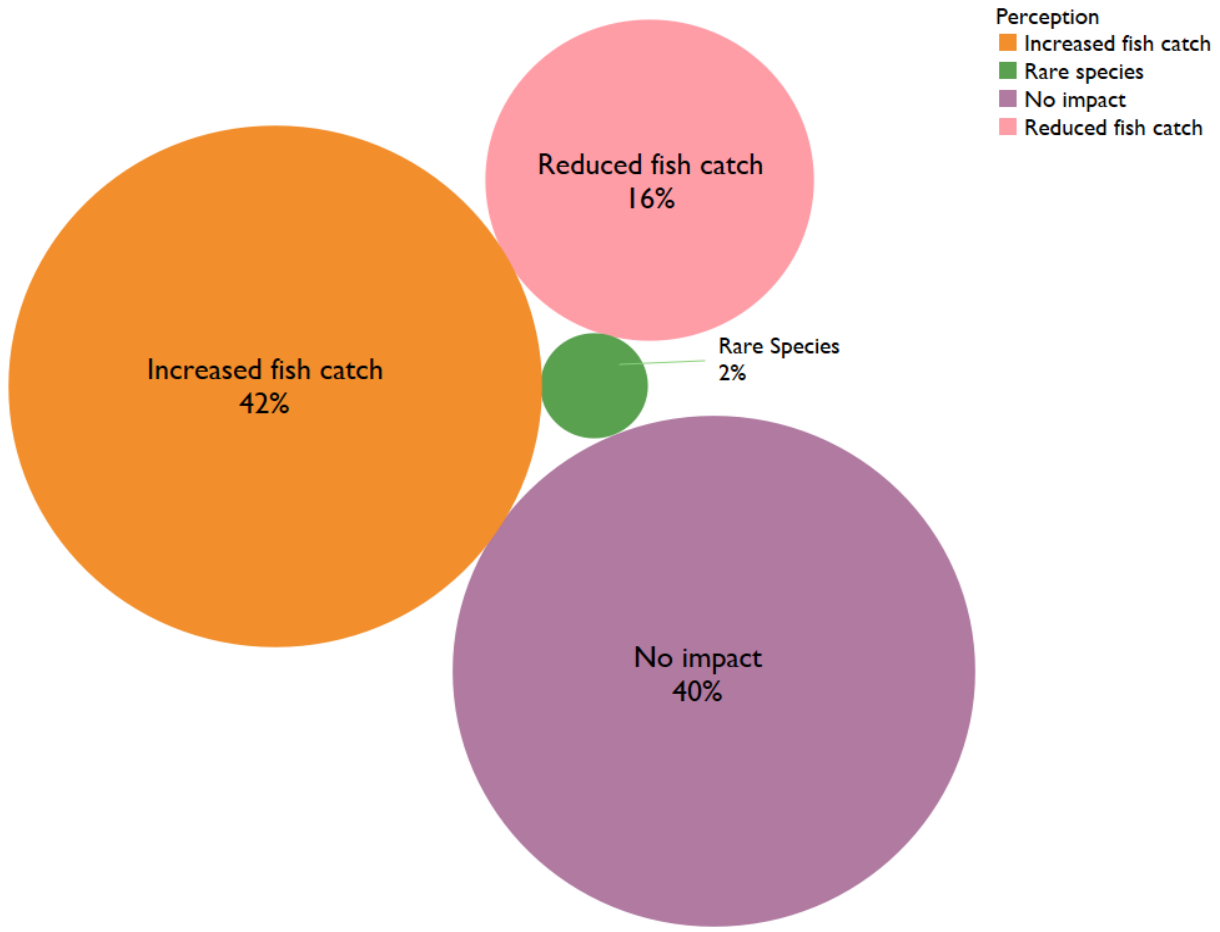

Figure 22: Impact of the closed season

The data were further analyzed to understand each district standpoint of the closed seasons and their level of interest in sustaining the policy. Forty-eight (48%) of fisherfolks in Effutu Municipal reported that, fish harvest increased with resumption of the closed season. Thirty-six (36%) of the fisherfolks reported of not observing any difference in fish catch after the close season. However, 12% of fisherfolks reported the there has even been reduction in fish catch after the closed season in the Effutu municipality. In Awutu Senya district, 58% of fisherfolks reported of observing an increase in fish catch post the closed season whereas 17% reported a decrease in fish catch with re-commencement of the closed season. Twenty-four (24%) of fisherfolks in the Awutu Senya district reported of not observing any difference in fish catch in the district. Gomoa district on the other hand, presented a 58% indifference in fish catch post the closed season and suggested 25% observation in fish catch increase. Fourteen (14%) of the fisherfolks in the district reported an observation of a decrease in fish catch. Shama and Ekumfi districts reported 39% and 41% fisherfolks observing in no increase in fish catch respectively. Also, 37% of fisherfolks in both Shama

and Ekumfi districts reported an observed increased in fish catch after the closed season. Apart from the Awutu Senya districts, all the other districts reported of harvest of some alien fish species with the resumption of the closed season. Figure 23 shows the districts perspective analysis of closed season impact on their fishing activities.

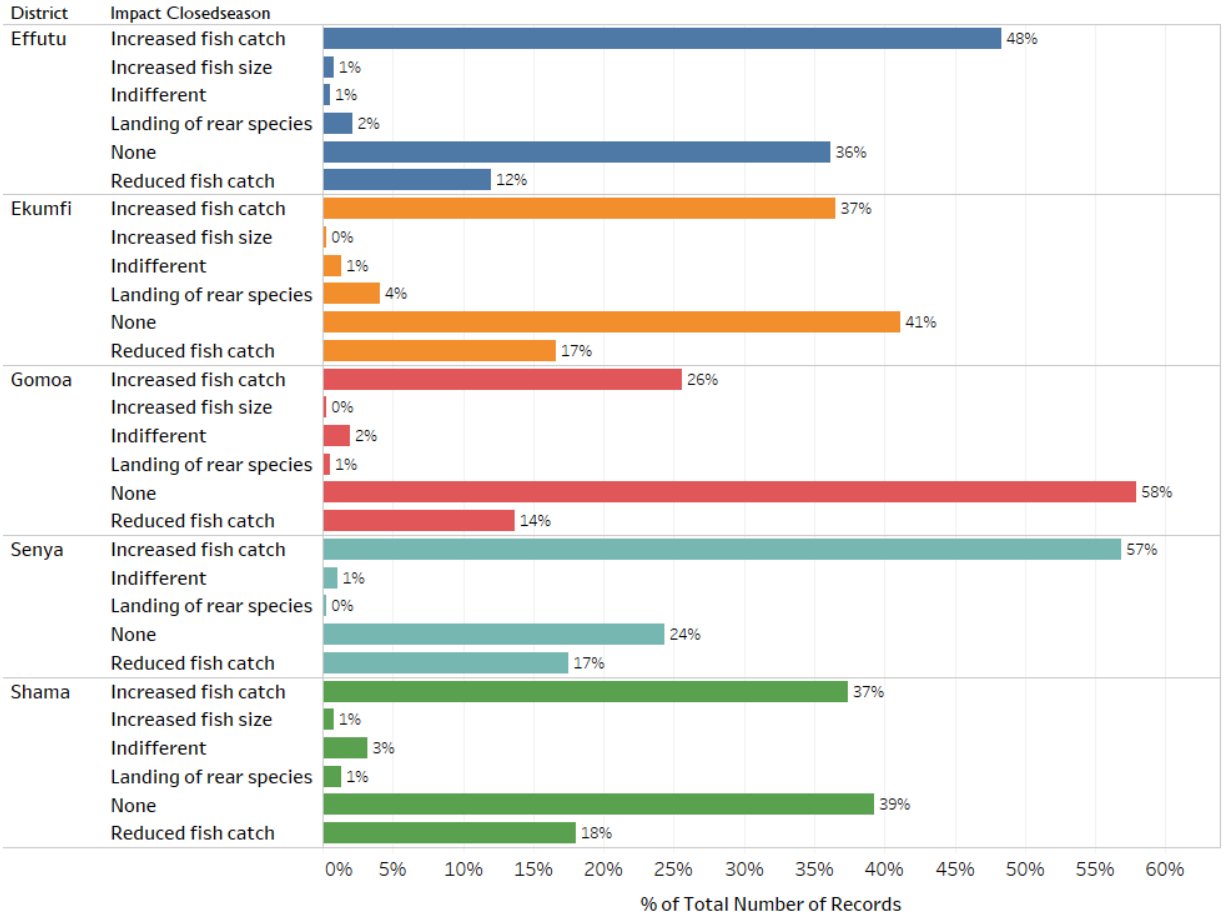

Figure 23: Impact of the closed season at district levels

3.6.3 Alternative Livelihoods During Closed Season

Analysis on livelihoods fisherfolks engaged in during the closed season revealed that, majority of respondents (72%) did not have any other or alternative livelihoods to support them during the closed season. Twenty-two (22%) of respondents were engaged in various alternate livelihoods to support them during this closed season. This indicates that, over two third of fisherfolks do not have any alternative livelihood and depend solely on fishing activities for their daily livelihood.

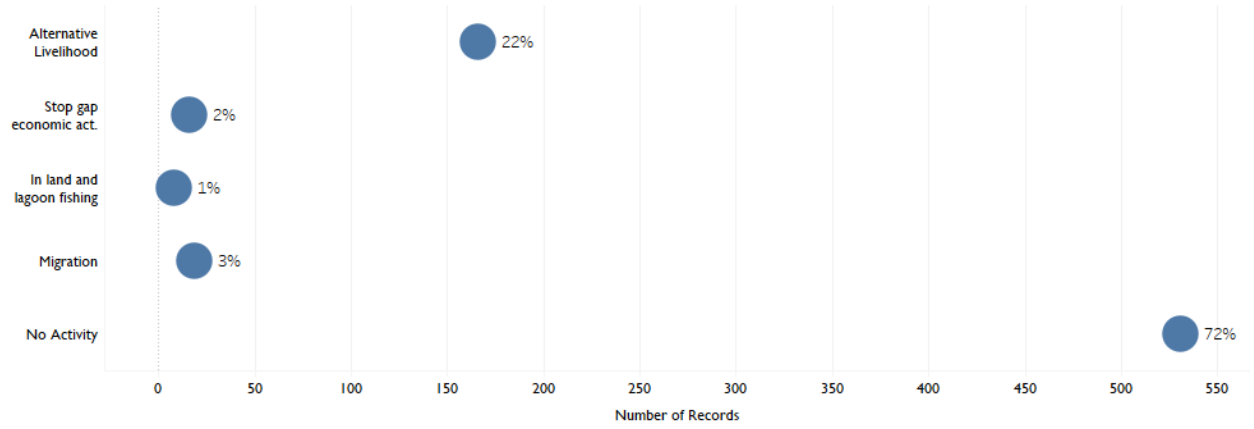

Figure 24: Economic activity during closed season

The research further looked into how fisherfolks with alternative livelihood perceived the closed as being beneficial or not. This was to verify fisherfolks reaction to the closed season in the presence or availability of alternative livelihood. It was realized that, availability of alternative livelihood did not matter as far as their perception on closed season is concerned. Fisherfolks, whether with alternative livelihoods or not carry similar opinions on the closed season.

The perception on whether there should be subsequent closed season was analyzed for both fishermen and the fish processors. The chart below (Figure 25) explains their independent perceptions with reasons for why there should or shouldn't be a subsequent closed season. Also, In the chart, it can be observed that, 35.2% of fishermen and 27.3% of fishmongers think there should be a subsequent closed season since it is a resting period for the sea to replenish fish stock (Figure 25).

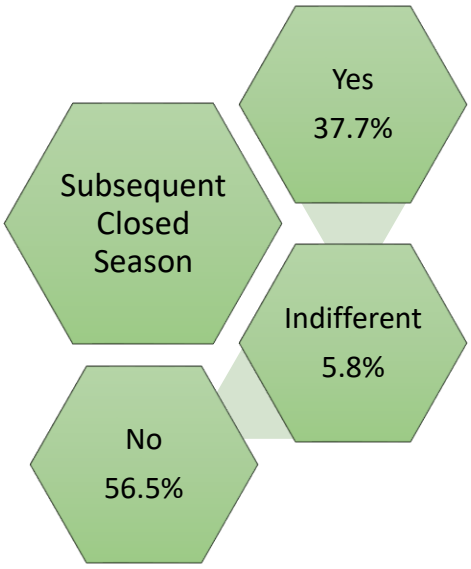

Figure 25: Subsequent closed season

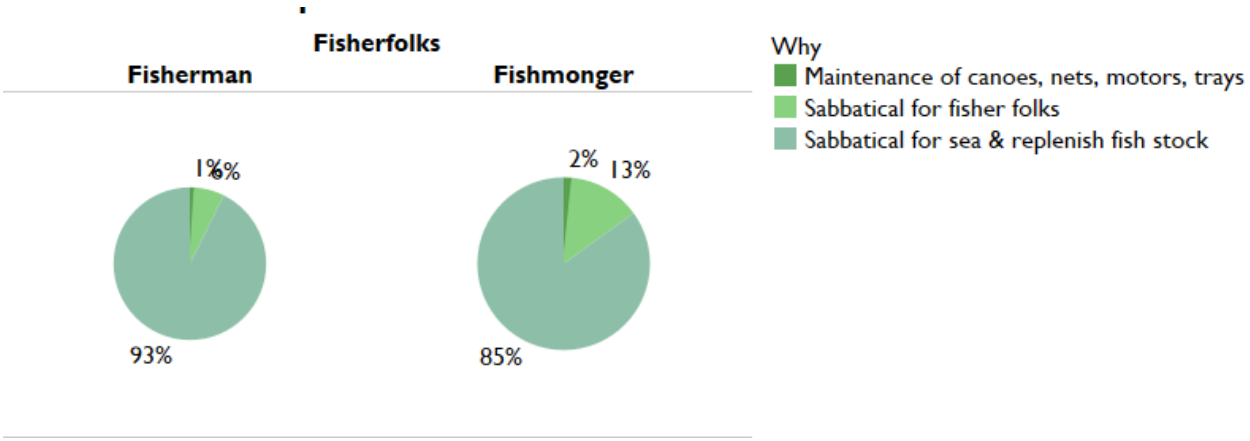

Figure 26: Reason for a subsequent closed season among fish folks

The remaining 56.5% who suggested there should not be any subsequent closed seasons outlined reasons for their suggestion. The indicated the reasons to be; no benefits were derived from the closed season; livelihoods were affected and the timing for the closed season was wrong. Figure 26 illustrates the different perspectives of the fishermen and fish processors.

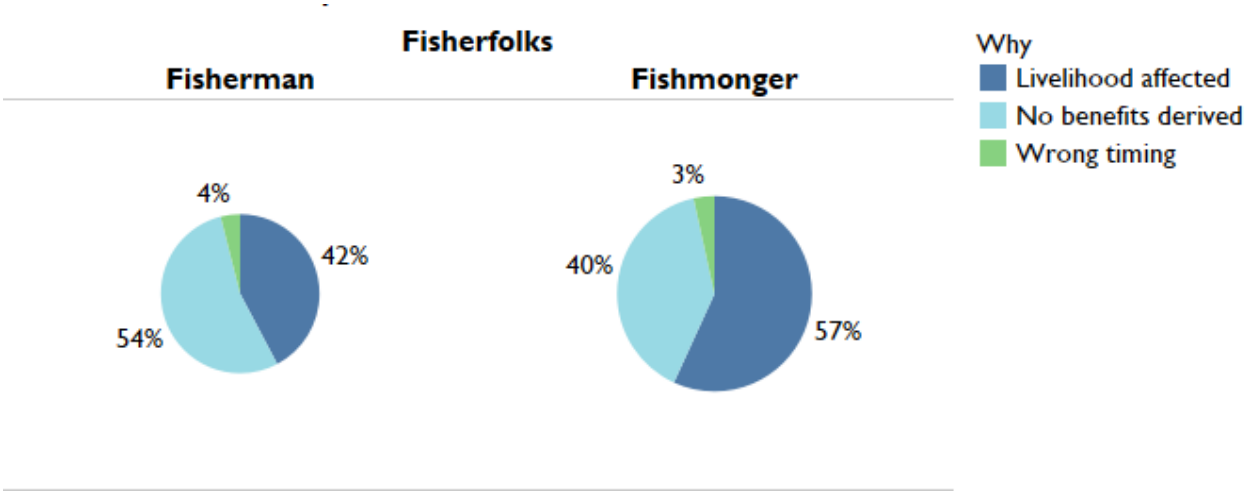

Figure 27: Reason for no subsequent close season among fish folks

3.7 Knowledge on Climate Change

The study investigated the respondents' level of understanding and experience on climate change issues and its impacts on fisheries activities. From the study, more than 70% of the respondents in the Effutu, Ekumfi, Gomoa and Shama Districts were not aware of the climate effects indicating that majority of the fisherfolk in these districts are not aware of the climate change. Respondents with knowledge on climate change indicated that they acquired such knowledge through NGO trainings and interventions. Family, friends and literature were other medium of learning about climate change. Figure 28 shows the percentage respondent aware of climate change awareness and coastal landscape changes by district statistics.

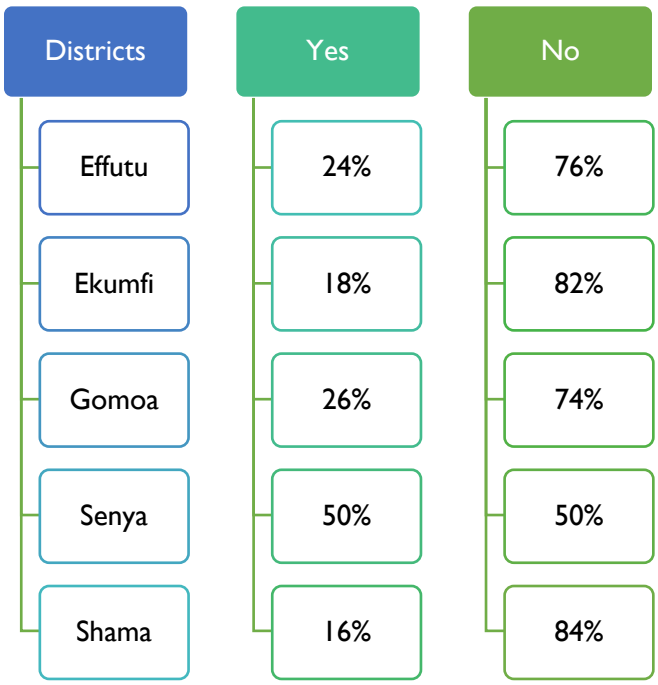

Figure 28: Coastal observations of climate change across the study districts

The result also showed that 40.3% of the respondents had been observing or experiencing rising sea levels and 16.2% cited increased intensity of storms as a consequence of climate change (Fig. 29). However, 34.4% of the respondents indicated that they did not experience any changes on the coastal landscape.

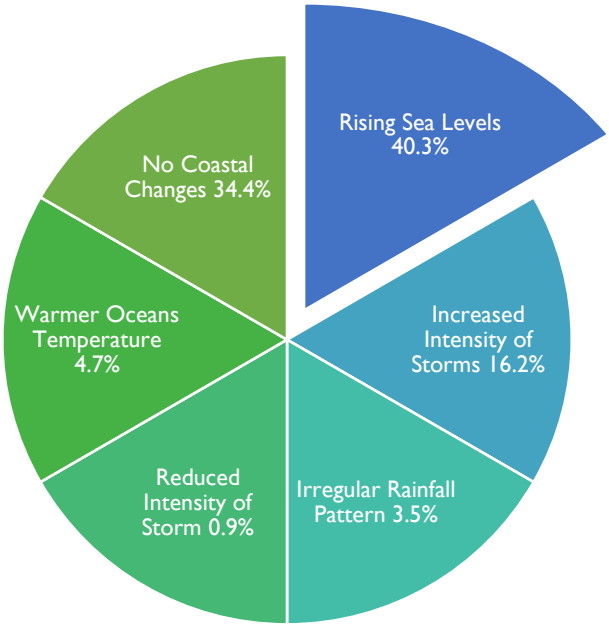

Figure 29: Perceptions of fisher folk on the consequences of climate changes

Some of the climate change consequences observed by the respondents over the past ten years include increase in

storm intensity, rising sea levels, irregular rainfall pattern and increase sea temperature. Only 0.9% of the respondents observed a decrease in storm intensity.

3.8 NGOs interventions

The project team found it necessary and interesting to know and understand past and existing NGO interventions in the districts with respect to fisheries activities. Also, the extent of knowledge and trainings received by target beneficiaries was also examined. Occupational Safety and Health training and best practices have become paramount in many fields. From the study, 92% of fishermen did not have any training on OSH and 83% of them did not have any training on best fishing practices. Similarly, 87% of the fishmongers did not have any training on OSH and 81% of them had no training on best fishing practices (Figure 30 & 31).

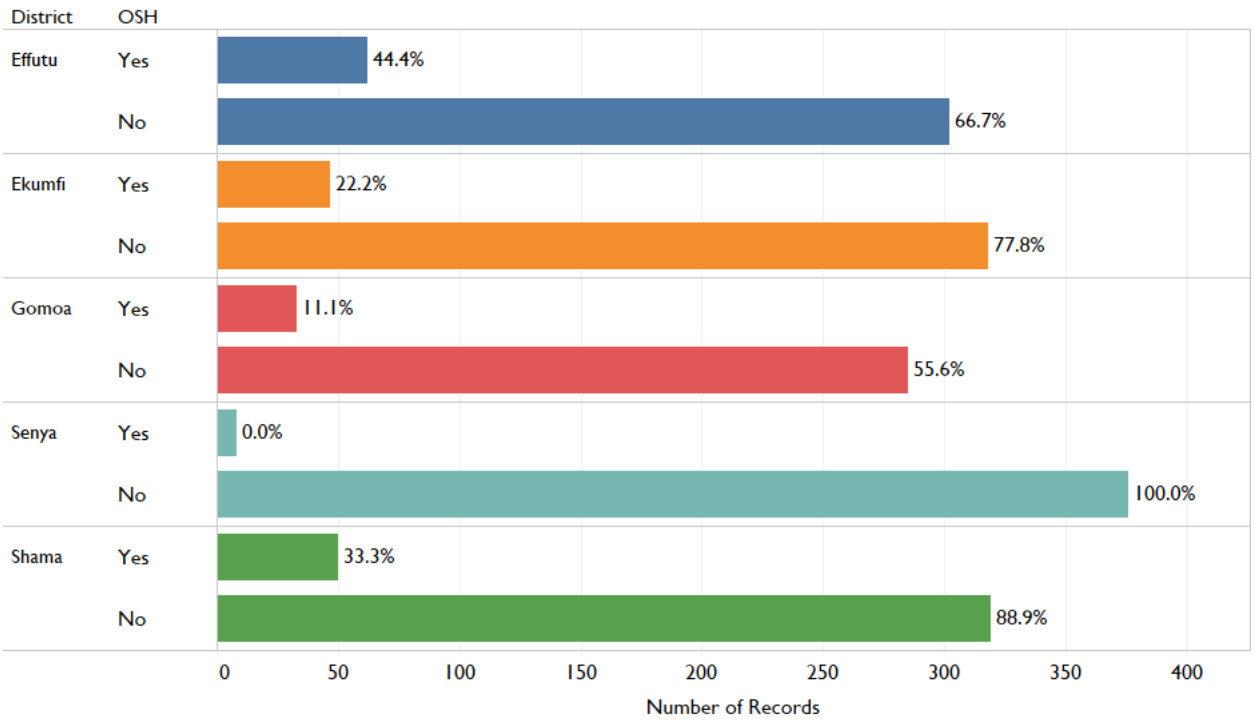

Figure 30: Training on occupational safety and health

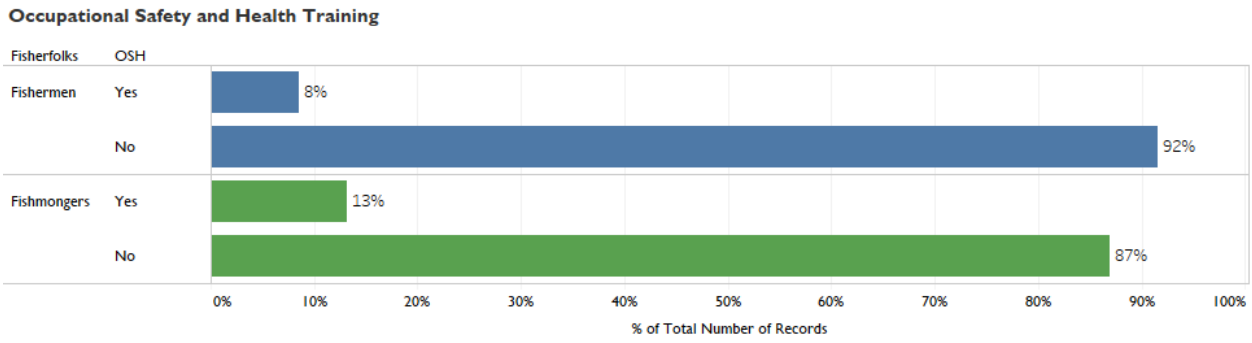

Figure 31: Percentage composition of the level of training of fisherfolk on Occupational Safety and Health

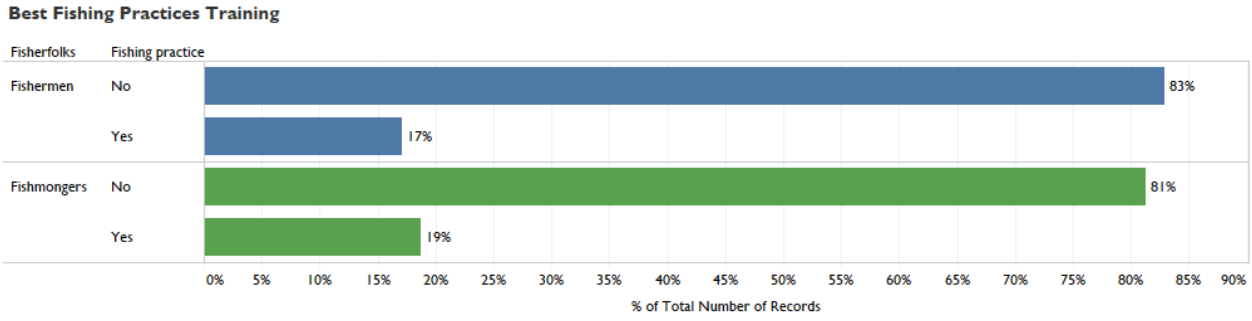

Figure 32: Percentage composition of the level of training of fisherfolk on best fishing practices

The study also examined the existing groups in the communities, their state and level of functionality. It was realized that, the past NGO interventions created some groups and association that are currently inactive (Table 5).

Table 5: Lists of fisher groups across the district

Effutu	Gomoa West	Ekumfi	Awutu Senya	Shama
Buafo yena	NAFPTA	Nambono yento	Nyira	SFMP Group
Enam progress	Mankoadze Konkofo association	NAFPTA	Medo Christ	Adam group ass.
DAA	Gyaaseahe	United	Gye Nyame	Daasgift
Anomansa	Baasonfo	Nyame ne ye boafo	Obiaa se ye	GNFC
Osimpam	Apam fish processors association	Nyame ye odo	Yen ti gyae	Apofohene ku
Osakam	Afari ankoa	Boa wo nua	Nyame ye kese	Wonsom
Obrapa	DAA	Nyame N' abana		Afarefo kuo
Obideaba	Nyame bekyre Konko kuo			Meyork
NAFPTA	Dago fish processors association			Anafo Association
GNFC	Adan Nsah fish processing group			

Kori Mbam	Dwenho			
Woarabeba				

3.9 Social Protection Services (SPS) in Fisheries

Power to the Fishers project seeks to forge a strategic partnership between social protection entities and target beneficiaries. The project limits its social protection interventions to health insurance, pensions and access to credit. Health insurance is a critical need for beneficiaries especially fish processors because of the occupational health hazards associated with fish smoking (exposure to smoke and heat). Life pension on the other hand, is necessary to provide financial support to fisherfolk in their old and inactive age. Access to credit has been a critical determinants of business growth in the fisheries sector. Credit is required by fishermen to finance their fishing expeditions. Fish processors also require credit to either finance fishing expeditions, purchase fish and/or other inputs. The baseline study assessed the current state of social protection services in the districts. The research started with assessing respondents' knowledge on social protection services. It was identified that, most respondents (74%) had good knowledge of social protection services particularly on health insurance, savings and credit facilities.

3.9.1 Social Protection Services of Interest to Respondents

Respondents were asked to select social protection services they find to be interesting and useful. This was an open-ended question. The results showed that 52% of the respondents chose multiple answers for this question whiles 48% chose single responses. The most common social protection packages of interest among the fisherfolk included credit, health insurance and savings. Health insurance is the most preferred option representing 48% (Fig. 33). Also, credit which is one of the most preferred packages had 18.5% of the respondents signed up.

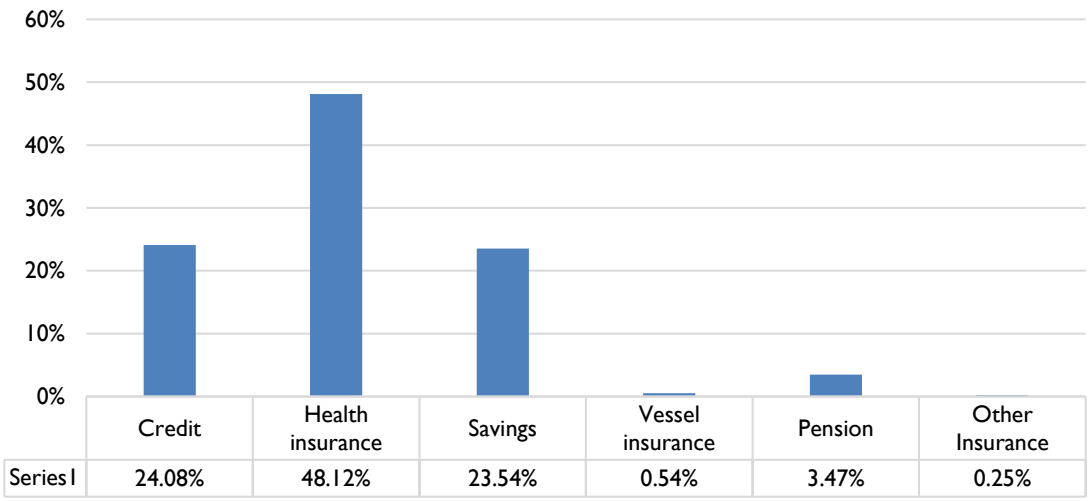

Figure 33: Social protection services of interest

To understand the social protection history among respondents, the study inquired into what services respondents had ever or currently signed on to and who or what influenced their decision of choice. The study revealed that, 62.9% of respondents had ever signed on to a social protection service in the past with health insurance being the most subscribed social protection service (41.4%) as shown in Fig. 34). About 49% of the respondents are currently signed on to a social protection service (Table 6).

Table 6: Number of people currently signed up for at least one social protection service

Are you currently signed up for a social protection service?	Frequency	Percent
Yes	909	49.03%
No	945	50.97%
Total	1854	100%

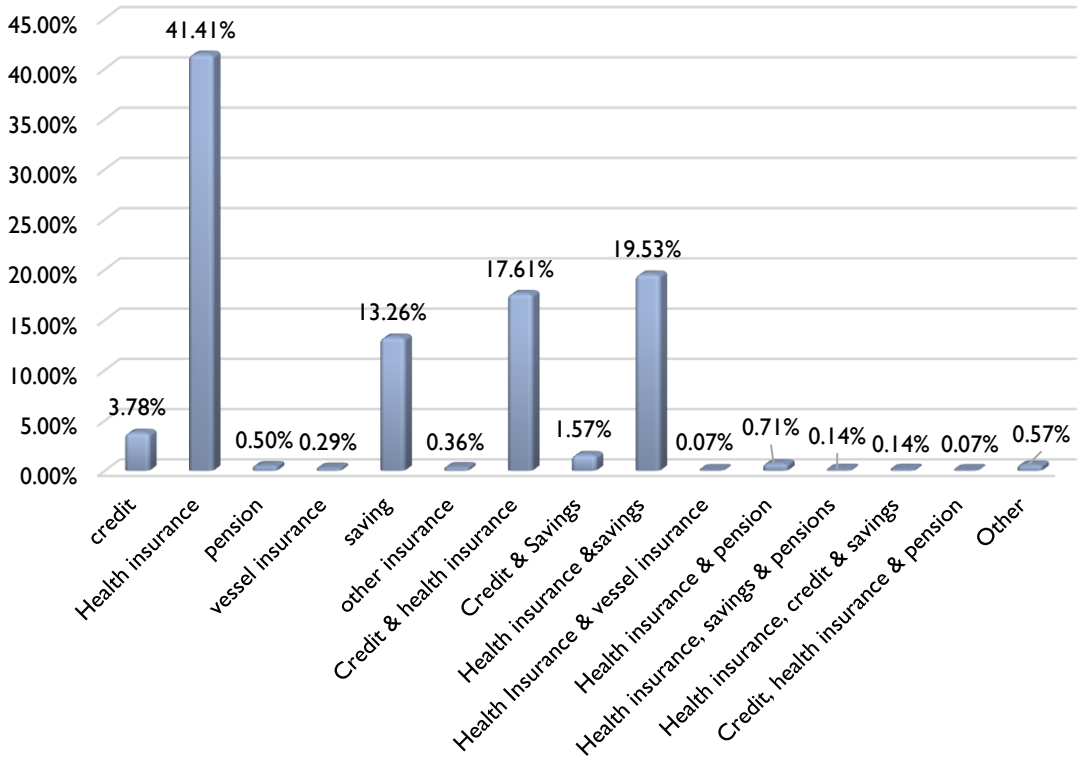

Figure 34: Different social protection services signed up by fisherfolk

A follow-up question to investigate who influences respondent's choice to signed on to a particular social protection service revealed that, service providers by themselves create awareness and sensitization which contributes to about 55.9% of the signed-on (Table 7). Family and friends contribute to 29.6% of the people who influence decision to sign on to a social protection package.

Table 7: Elements that influence the fisherfolks to sign on to SPS

What influences your decision to sign on to SPS?	Frequency	Percent
Family, Friends, colleagues	302	29.55%
Donor-funded initiative	32	3.13%
Sensitization by service provider	571	55.87%
Personal decision	45	4.40%
Family, friends, colleagues & Donor funded initiative	72	7.05%
Total	1022	100%

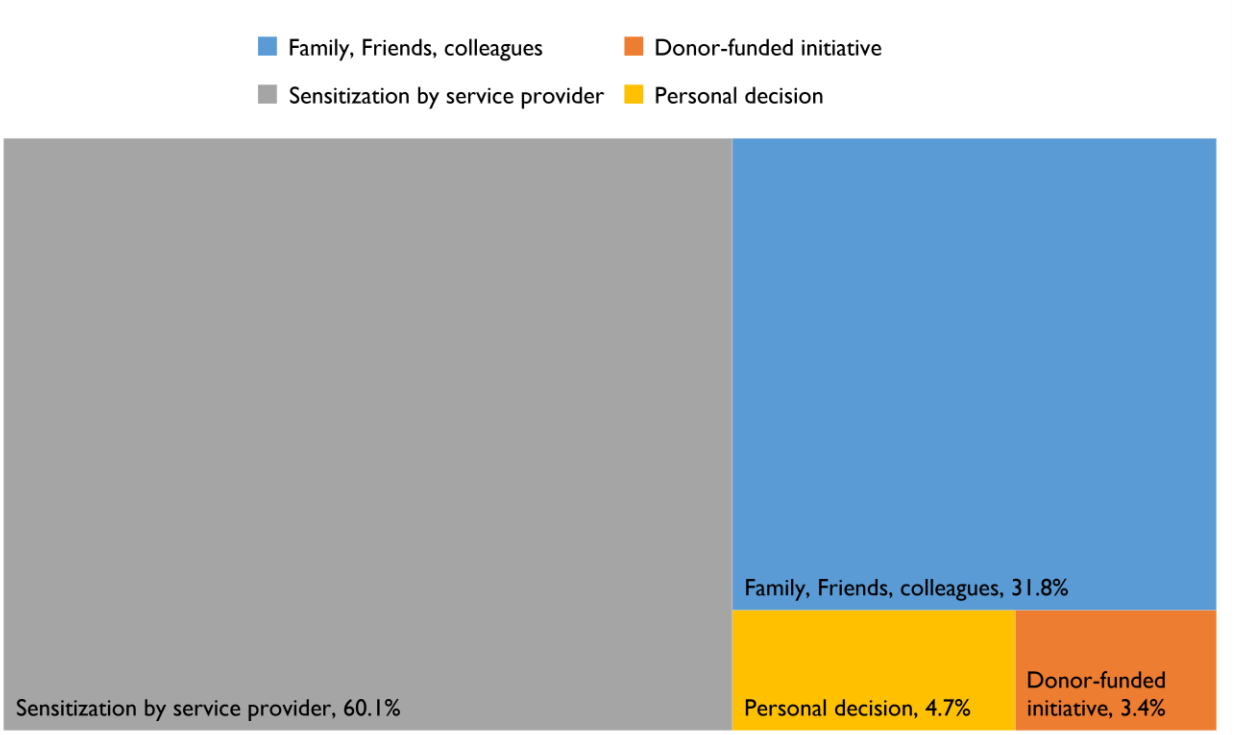

Figure 35: Who influenced your decision to sign up to SPS?

Some category of respondents stated their reluctance to sign up to social protection services for a number of reasons. About 12% of the respondents who had signed up for a social protection service at one point in the past are no longer using the service. From the study, the primary reasons given for not signing up for the services included low income (44.3%), no knowledge (19.4%), inadequate information (16.9%), past bad experiences (12.3%), minimal benefits (5%) and procedural difficulties (2%).

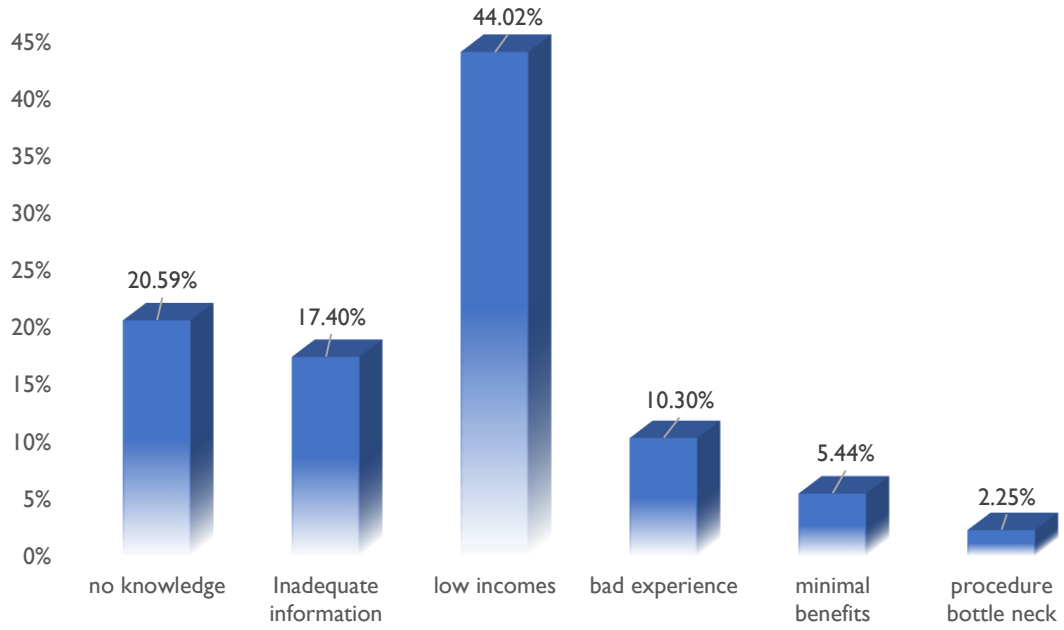

Figure 36: Primary reasons preventing fisherfolk from signing up for social protection services

4.0 SUMMARY OF RESULTS AND FINDINGS ON OUTCOME INDICATORS

Intervention Area	Expected Outcomes	Indicator	Baseline Findings
1 Engage relevant stakeholders and value chain actors in target areas for project implementation	Improved knowledge on the current fishery issues within the target areas	Improved knowledge of the key actors within the target districts	
	Enhanced efficiency in inter-stakeholder relations and interactions	A baseline report	
		Number of project community groups	
2 Knowledge transfer and adoption of improved and environmentally friendly smoking technologies and fuels.	20 smoking centres constructed. Increased productivity time for fishmongers by a minimum of 48 hours per week At least three private sector partnerships created to supply dried coconut husks to 30 communities	Perception of fishmongers using efficient smoking technologies and coconut husk as fuels Number of fish smoking facilities constructed Number of fishmongers using efficient smoking technologies and coconut husk fuels.	• Perception of fishmongers was not captured. In Shama, 8 fishmongers use Ahotor whiles 30 of them use coconut husks in one way or another as fuel. In Effutu, 16 people use Ahotor whiles 94 of them use coconut husks. In Ekumfi, 17 use Ahotor whiles 77 of them use coconut husks In Gomoa West, 4 use Ahotor whiles 38 use coconut husks. In Awutu Senya, 15 use Ahotor while 6 use coconut husks

	At least 200 jobs created through coconut waste aggregation, processing and bagging	Number of communities supplied with coconut husks to be used as energy source for ovens Number of people employed in the aggregation of coconut husks.	• There is no data on the number of fish smoking facilities constructed • Communities supplied with coconut husks to be taken from Shammah. Same as the number of people employed in its aggregation
3 Capacity building on appropriate fishing and business practices, environment protection, climate change, health and safety.	Increased knowledge on best practices by about 50% of the target audience Improved business practices adopted by about 30% of the target groups.	Knowledge and capacities of trainees before and after trainings. Names and location of trained individuals The topics and outcomes of dialogues	• For training on best fishing practices, Shama recorded 21% (79/386), Effutu 22% (82/373), Ekumfi 23% (88/377), Gomoa West 17% (62/365) and Awutu Senya 5%(18/387). 17% (329/1888) had received training in all • For training on occupational health & safety, Shama recorded 13% (51/386), Effutu 17% (64/373), Ekumfi 12% (47/377), Gomoa West 9% (33/365) and Awutu Senya 2% (8/387). In all 11% (203/1888) had received training on occupational health & safety.

4 Strategic partnerships between target groups and social protection service providers	Increased social protection for target groups particularly fishmonger. At least 10 social protection service providers engaged by the groups- facilitated by the project team. 1 social protection service adopted by about 20% of target groups	Perception of beneficiaries on the quality of social protection services they are accessing Number of social protection services entities engaged by the target groups The numbers within the target groups that have adopted the social protection service and the nature of service adopted	• Perceptions were not captured 10. • The target group are mainly interested in 5 social protection services. Ranked in descending order of interest, these are health insurance, credit facilities, savings facilities, pension and vessel insurance. There was also a section who were interested in fringe protection packages. 11. • Of the respondents who were interested in only one social protection services, health insurance was the highest with 392 (50%) of the respondents choosing that. The other packages have been captured as follows; credit facilities (218, 28%), savings (144, 19%), pension (13, 2%) and vessel insurance (5, 1%). Like before there was a case of fringe protection packages (6, 1%).

5.0 CONCLUSION

The conclusions of the study are derived from the baseline finding and are presented in line with the research thematic areas.

The project beneficiaries dominate within the age range 31 - 50 years; the Shama and Gomoa Districts had more youth engaged in fishing. Most of the target beneficiaries have extremely low level of education. About 55% had no formal education at all across the 5 districts. About 79% of beneficiaries were married and 8.6% were widows. Approximately 66% of beneficiaries derived their livelihoods solely from fishing and fish processing business. In addition to fishing related businesses, fisherfolks (about 34%) engaged in other businesses such as petty trading, service business, artisanship and farming for their livelihood.

The fish species usually landed across the five project districts included *Sardinella* spp*, Thunnini* spp*, Scomber* spp*, Engraulis encrasicolus, Sphyraena* spp*, Lutjanus campechanus, Chloroscombrus chrysurus, Micropogonias undulates*. Fish landed harvested are priced based on the following factors; size and specie type, fish quality, prevailing market price, availability and cost incurred during the fishing expedition.

Beneficiaries were aware of Government of Ghana's support to the fisheries sector through subsidies on fishing inputs but stated the key challenges such as lack of information, corruption and political influences and insufficient supply as factors affecting their ability to access these supports regularly. The general challenges associated with fishing business were; access to fuel and fishing equipment, the practices of IUU fishing, financing, among others.

Although fish is processed in numerous ways such as sun drying, frying, salting and smoking within the coastal communities of the districts, smoking is the most frequent method. A number of processors apply more than one method for processing their fish. Popular fish smoking stoves used by fish processors include the "Ahotor" oven, "Chorkor" oven, cylindrical/rectangular mud and metal oven. The 'Chorkor" oven is the most widely used among them. Most respondents estimated at about 96% utilize fuelwood for smoking.

Closed season was reported to have significant impacts on the livelihoods of fisherfolk although about 42% of the respondents indicated they observed increased fish catch after the fishing moratorium was lifted. At the district level, Awutu Senya district and Effutu Municipal areas reportedly observed high fish catch after the closed season. About 56.5% expressed disapproval for the institution of subsequent closed seasons.

Participants expressed their understanding of climate change by outlining their observation on the change of the coastal environment over the past 10 years. They mentioned that, rising sea levels, increased storm intensities, irregular rainfall patterns and warmer ocean temperatures are all part of their recent experiences that could be linked to changes in climatic conditions occurring within the districts.

The baseline identified health insurance, savings and credit as the social protection services of interest to fisherfolk and about 63% of respondents have already signed up for these social protection packages.

6.0 RECOMMENDATIONS

Training materials and meeting schedules should be planned to suit beneficiaries. Mindful of the educational background of most of the beneficiaries, information, education and communication materials should be designed with simple languages and pictures that can be full appreciated. Meeting times should be well planned so as not to distort family time since most beneficiaries are married.

Capacity building on business diversification should be provided to beneficiaries to equip them with knowledge and capacity to venture into other alternative businesses. This will contribute to the ultimate project goal of enhancing socio-economic livelihoods of fisherfolks.

Advocacy programs should be organized to address issues related to GoG subsidies and challenges thereof. Adequate information should be provided on subsidies and fair distribution should be encouraged. Since beneficiaries know and understand the impact of IUU fishing practices, trainings and sensitization should be intensified on the need to deviate from such practices.

Quite a number of beneficiaries use the traditional method of fish processing. More education should go into the need to adopt the improved technology accompanied with improved fish processing practices. The needed incentives should be provided to beneficiaries to enable them improve their methods.

Sensitization should be enhanced on climate change awareness in the project districts. Capacity building on climate adaptation measures should be provided to ensure beneficiaries are physically and psychologically prepared for the changing climatic environment.

It is recommended the project work closely with other ongoing projects in the fisheries sectors to take advantage of potential synergies thereof. In this light, the project should acquire existing groups and association in project areas and strengthen them to be used for their engagement activities.

Since beneficiaries clearly indicated health insurance, savings and credit as the main social protection service of interest, it is recommended the project limits its intervention to these services and intensify its facilitation to ensure increased in signed up rate and improvement in the standard of living of beneficiaries.

Capacity building programs on fisheries management, climate change adaptation and mitigation should be promoted within the districts to ameliorate the potential effects of climate change impacts on fisher livelihoods.

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APPENDIX 1

QUESTIONNAIRE FOR BASELINE STUDY (FISHERMEN)

CERATH Development Organisation (CDO) is implementing a sustainable fisheries project dubbed "Power to the Fishers". As part of the project, CDO will undertake a baseline study in the project districts. This is to gain insight on the current state and conditions prevalent in the fisheries sector. This study seeks to investigate fishermen's attitudes and opinions on fishing practices, climate change, impacts of the closed season, and social protection services. Information provided by the respondent will be kept confidential and respondent's identity will not be disclosed.

Name of Interviewer …… Date of Interview ……

Community …… District ……....

Demographics

1. Name of respondent ……..
2. Age
   i. under 18 ii. 18 – 30 iii. 31 – 40 iv. 41 - 50 v. 51 – 60 vi. 61 and above
3. Gender i. Male ii. Female
4. Number of dependents (persons under 18)
   i. None ii. 1-3 iii. 4-6 iv. 7-9 v. 10 and above
5. Occupation ……
6. Years of experience
   i. Up to 5 yrs ii. 6-15 yrs iii. 16-30 yrs iv. 31 yrs and above
7. Alternate livelihood(s)
   i. N/A ii. Artisanship iii. Petty trading iv. Other ……...
8. Average income per week (includes alternate livelihood)
   i. up to ₵500 ii. ₵501 – ₵1500 iii. ₵1501 – ₵2500 iv. ₵2501 – ₵3500
   v. ₵3501 and above
9. Years of education (preschooling not included) ……...
10. Level of Education
    i. None ii. Elementary/JHS iii. Secondary iv. Other ……
11. Marital Status
    i. Single ii. Married iii. Divorced iv. Widowed

Past and Present Activities in the Fishery Value Chain

12. Do you belong to any fisher group? i. Yes ii. No
13. If yes, state the name of the group(s) ……
14. Have there been any past donor-funded interventions in the community? i. Yes ii. No
15. Have you ever been a beneficiary of a donor-funded intervention? i. Yes ii. No

    b. Number of interventions benefitted from? ……

    c. Last intervention benefited from? (name of intervention, donor, & implementing partner) ……..

    ……

    ……

Fishing Practices

16. Do you own a canoe? i. Yes ii. No
17. If yes, how many? ……
18. Do you finance fishing expeditions i. Yes ii. No
19. If yes, how do you source funds to finance fishing?

    i. Self-financed ii. Financial institutions iii. Other …….....
20. If 'no' for '18', who finances your fishing expeditions?

    i. Fish queens ii. Other …….
21. What factors inform price setting of fish landed? ……
22. What is your role on the fishing vessel?

    i. Captain ii. Secretary iii. Other ……
23. What kind of vessel do you utilize?

    i. Outboard canoe ii. Non-outboard canoe iii. Other ……
24. What fishing gear(s) do you use?

    i. Ali-Poli-Watsa ii. Hook and line iii. Set net

    iv. Purse seine nets v. Drift gillnet vi. Beach seine
25. What is the average number of hours spent in a fishing expedition? ……
26. What is number of hours spent in a week fishing? …….
27. How many fishing expeditions do you carry out in a week?

    i.1 - 2 ii. 3 - 4 iii. 5 – 6 iv. 7 and over
28. What are the 3 fish species you land most frequently? …….
29. Have you received training on best fishing practices i. Yes ii. No

    b. Organizers (of last training) …… d. Date (of last training) ……....…….

    c. Topics covered …… e. Community/District ……...……

30. Have you received trainings on Occupational Safety and Health (OSH)? i. Yes ii. No

    b. Organizers (of last training) …… d. Date (of last training) ……..……

    c. Topics covered …… e. Community/District ……

31. Did you observe the recently ended 'closed season'? i. Yes ii. No
32. Was the closed season beneficial?

    i. Strongly agree ii. Agree iii. Indifferent iv. Disagree v. Strongly disagree

33. Were you engaged in any economic activity during the closed season? i. Yes ii. No
34. If yes, what were you engaged in?

    …….....

35. What has been the impact of the closed season on fish stock?

    i. None ii. Increased fish catch iii. Reduced fish catch

    iv. Other ……

36. Should there be subsequent closed seasons? i. Yes ii. No
37. Why? ……...
38. Are you a beneficiary of government subsidies? i. Yes ii. No
39. If yes, what subsidies do you receive? *(tick as many as may apply)*

    i. Fuel ii. Outboard motors iii. Fishing gears iv. Other.....

40. If 'no' for '38', why are you not a beneficiary? ……
41. Do you believe provision of government subsidies contributes to overfishing? i. Yes

    ii. No

42. Would you want government subsidies to be i. Sustained ii. Scrapped
43. Give reason(s) for your answer? .....
44. Do you perceive your fishing methods to pose a threat to sustainable management of fish stock?

    i. Yes ii. No

45. If yes, in what ways?

    …….....

46. What are the common 3 challenges you face in your line of work?

    .....……

Awareness and Impacts of Climate Change

47. Do you know about climate change? i. Yes ii. No
48. If yes, how did you get to know about climate change? *(tick as many as may apply)*

    i. Family, friends, colleagues ii. Donor-funded initiatives iii. Literature

iv. Other ……

49. Have you noticed any particular changes in the coastal & marine environment over the past 10 years?

    i. Yes ii. No

50. If yes, what threats have you observed arising out of climate change? *(tick as many as may apply)*

    i. Rising sea levels ii. Increased intensity of storms

    iii. Warmer ocean temperatures iv. Other …….

Social Protection Services

51. Do you know of any social protection packages? i. Yes ii. No
52. If yes, name 3 social protection services that are of most interest to you?

    ……

53. Have you ever signed up for any social protection service? i. Yes ii. No
54. If yes, name them (type of social protection package & service provider)

    ……

55. If 'yes' for '53', who influenced your decision to sign up?

    i. Family, friends, colleagues ii. Donor-funded initiatives

    iii. Sensitization by service providers iv. Other ……

56. Are you presently signed up for any of the social protection service? i. Yes ii. No
57. If yes, name them (type of social protection package & service provider)

    ……

    …

58. If 'no' for '56', what is the primary reason holding you back?

    i. No knowledge on issue ii. Inadequate information iii. Low incomes

    v. Other *(specify)* …….

APPENDIX 2

QUESTIONNAIRE FOR BASELINE STUDY (FISHMONGERS)

CERATH Development Organisation (CDO) is implementing a sustainable fisheries project dubbed "Power to the Fishers". As part of the project, CDO will undertake a baseline study in the project districts. This is to gain insight on the current state and conditions prevalent in the fisheries sector. This study seeks to investigate fishmongers' attitudes and opinions on fish processing, climate change, impacts of the closed season, and social protection services. Information provided by the respondent will be kept confidential and respondent's identity will not be disclosed.

Name of Interviewer …….. Date of Interview ……

Community …… District ……....

Demographics

---

1. Name of respondent ……..
2. Age
   i. under 18 ii. 18 – 30 iii. 31 – 40 iv. 41 - 50 v. 51 – 60 vi. 61 and above
3. Gender i. Male ii. Female
4. Number of dependent(persons under 18)
   i. None ii. 1-3 iii. 4-6 iv. 7-9 v. 10 and above
5. Occupation
   ……
6. Years of experience
   i. Up to 5 yrs ii. 6-15 yrs iii. 16-30 yrs iv. 31 yrs and above
7. Alternate livelihood(s)
   i. N/A ii. Artisanship iii. Petty trading iv. Other ……...
8. Average income per week (includes alternate livelihood)
   i. up to ₵500 ii. ₵501 – ₵1500 iii. ₵1501 – ₵2500 iv. ₵2501 – ₵3500 v. ₵3501 and above
9. Years of education (preschooling not included) ……...
10. Level of Education
    i. None ii. Elementary/JHS iii. Secondary iv. Other ……
11. Marital Status
    i. Single ii. Married iii. Divorced iv. Widowed

Past and Present Activities in the Fishery Value Chain

---

12. Do you belong to any fisher group? i. Yes ii. No
13. If yes, state the name of the group(s)
    ……
14. Have there been any past donor-funded interventions in the community? i. Yes ii. No
15. Have you ever been a beneficiary of a donor-funded intervention? i. Yes ii. No
    b. Number of interventions benefitted from? ……
    c. Last intervention benefited from? (name of intervention, donor, & implementing partner)
    ……

Methods of Fish Processing

---

16. What is your role along the value chain? *(tick as many as may apply)*
    i. Fish queen/ trader ii. Fish processor iii. Other …….

Fish Queen/ Trader (Applies for those who ticked 'fish queen/ trader' in '16')

17. What are the 3 common fish species you sell?
    ……..
18. Do you finance fishing expeditions? i. Yes ii. No
19. If yes, what factors inform price setting of fish landed?
    ……
20. If 'yes' for '18', how do you source funds to finance fishing?
    i. Self-financed ii. Financial institutions iii. Other ……..
21. Do you own a canoe? i. Yes ii. No
22. If yes, how many canoes? ……
23. What are the 3 main challenges you face in sourcing fish from fishermen?
    …….

Fish Processor (Applies for those who ticked 'fish processor' in '16')

24. What are the 3 common fish species you process?
    ……..
25. How is your fish processed? *(tick as many as may apply)*
    i. Smoking ii. Salting iii. Sun drying iv. Other ……

26. Are you engaged in multi-stage processing (any major processing activities done before getting the final processed product)?

i. Yes ii. No

27. If yes, what stages (in chronological order) are involved?

……..

Fish Smoking (Applies for those who ticked smoking in '25')

28. If you smoke fish, what smoker oven do you use?

i. Chorkor Smoker ii. Ahotor Stove iii. Cylindrical/rectangular mud oven
iv. Cylindrical/rectangular metal oven vi. Other ……..

29. Do you own a smoker oven? i. Yes ii. No

30. If yes, how many? ……

31. How did you acquire the smoker oven?

i. Self-financed ii. Donor-funded iii. Other ……

32. If 'no' for '29', what arrangement allows you to utilize a smoker oven?

i. Open access ovens ii. Pay-as-you-go ovens iii. Others ……

33. How were you introduced to your current oven?

i. Socialized into it ii. Peer-to-peer recommendation iii. Donor-funded initiative

iv. Other …….....

34. How many times do you smoke fish in a day during a bumper season?

i. 1 – 2 ii. 3 – 4 iii. 5 – 6 iv. 7 and above

35. How many days in a week do you smoke fish during a bumper season

i. 1 – 2 ii. 3 – 4 iii. 5 – 6 iv. 7

36. How many times do you smoke fish in a day during a lean season?

i. 1 – 2 ii. 3 – 4 iii. 5 – 6 iv. 7 and above

37. How many days in a week do you smoke fish during a lean season

i. 1 – 2 ii. 3 – 4 iii. 5 – 6 iv. 7

38. What do you utilize as fuel for fish smoking? *(tick as many as may apply)*

i. Fuel wood ii. Coconut husk iii. Sugarcane bagasse iv. Other ……

39. If you use fuel wood, how do you source the fuel wood? *(tick as many as may apply)*

i. Self-harvesting ii. Purchase from dealers iii. Other ……

40. If you self-harvest fuelwood, where do you source the fuel wood? *(tick as many as may apply)*

i. Nearby vegetation ii. Forest resource /Woodlot iii. Mangrove iv. Other …….

41. If you purchase fuelwood, what are the 3 main source locations?

……

42. Do you know of any individual/company engaged in the aggregation and sale of coconut husks?

i. Yes ii. No

43. If yes, name them

……

44. Have you received training on best fish processing practices i. Yes ii. No

b. Organizers (of last training) …… d. Date (of last training) ……...…….

c. Topics covered …… e. Community/District ……...……...

45. Have you received training on Occupational Safety and Health (OSH)? i. Yes ii. No

b. Organizers (of last training) …… d. Date (of last training) ……...…….

c. Topics covered …… e. Community/District ……...……

46. Are there any health problems (for processor) with the use of your smoking technology?
i. Yes ii. No

47. If yes, what are they?

……...

48. Do you perceive your smoking technology to be safe for consumers? i. Yes ii. No

49. If no, in what ways is it unsafe?

…….....

50. What are the 3 major challenges you face in your line of work?

……

General Questions (Applies to all)

51. Do you know about the closed season? i. Yes ii. No

52. Was the closed season beneficial?

i. Strongly agree ii. Agree iii. Indifferent iv. Disagree v. Strongly disagree

53. What has been the impact of the closed season on fish mongering?

i. None ii. Increased fish iii. Reduced fish iv. Other …….. 54.

Were you fish mongering during the closed season? i. Yes ii. No

55. If yes, how did you source fish?

i. Cold stores ii. Other ……

56. If 'no' for '54', what livelihood were you engaged in during the closed season?

i. None ii. Other …….....

57. Should there be subsequent closed seasons? i. Yes ii. No

58. Why?

……

Awareness and Impacts of Climate Change

---

59. Do you know about climate change? i. Yes ii. No

60. If yes, how did you get to know about climate change? *(tick as many as may apply)*

    i. Family, friends, colleagues ii. Donor-funded initiatives iii. Literature

    iv. Other ……

61. Have you noticed any particular changes in the coastal & marine environment over the past 10 years?

    i. Yes ii. No

62. If yes, what threats have you observed arising out of climate change? *(tick as many as may apply)*

    i. Rising sea levels ii. Increased intensity of storms iii. Warmer ocean temperatures iv. Other …….

Social Protection Services

---

63. Do you know of any social protection packages? i. Yes ii. No

64. If yes, name 3 social protection services that are of most interest to you?
    ……

65. Have you ever signed up for any social protection service? i. Yes ii. No

66. If yes, name them (type of social protection package & service provider)
    ……

67. If 'yes' for '65', who influenced your decision to sign up?

    i. Family, friends, colleagues ii. Donor-funded initiatives iii. Sensitization by service providers iv. Other ……

68. Are you presently signed up for any of the social protection service? i. Yes ii. No

69. If yes, name them (type of social protection package & service provider)
    ……

70. If 'no' for '68', what is the primary reason holding you back?

    i. No knowledge on issue ii. Inadequate information iii. Low incomes

    v. Other *(specify)* …….

APPENDIX 3

QUESTIONS FOR BASELINE STUDY (EXPERT INTERVIEWS)

1. General opinion on the fishery sector of Ghana
2. Potential and prospects of fish processing in Ghana
3. What are the dominant fish processing techniques in Ghana? (FC Only)
4. How much of fresh/processed fish is exported? (FC Only)
5. Personal assessment on regulators in the sector (FC, FDA, MOFAD..)
6. Perceptions on fisher associations and groups/ contributions to the sector
7. General perceptions on IUU/ Saiko practices (causes, effects, solutions, previous attempts and recommendations)
8. Socio-economic effects of the closed season
9. General perception on climate change and its impact on fisheries