

A RETURN TO THE GHANAIAN CULTURAL VALUES OF CLOSED FISHING SEASON IN GHANA'S ARTISANAL MARINE FISHING: AN ESSENTIAL MEANS OF RESTORING SMALL PELAGIC FISH STOCKS

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ABSTRACT

Closed fishing season for artisanal and inshore fishing is an effective management measure for restoring the fish stock. The study aimed at assessing the impacts of the closed fishing season observed in the Sekondi harbour in Ghana. The findings revealed that the one month closure period was too short and/or lack of strict supervision to realize any significant change in fish population and sizes. A more transparent discussion on the period for the closure, longer closure period up to three months as well as provision of alternative sources of livelihood were suggested to ensure more cooperation from the fisher folks.

RÉSUMÉ: Un retour sur les valeurs culturelles Ghanéennes de la saison de pêche fermée dans la pêche marine artisanal du Ghana: Un but essentiel pour la restauration des petits bancs de poisson pélagique.

Les saisons de pêche fermée pour la pêche côtière artisanal est une mesure efficace pour la restauration des bancs de poissons. L'étude avait pour but d'évaluer l'impact de la saison de pêche fermée dans le port de Sekondi au Ghana. Les résultats ont démontrés qu'un mois de fermeture de la pêche était trop court et/ou manquait d'une supervision stricte pour réaliser un changement important dans la taille et la population des poissons. Une discussion plus transparente sur la période de fermeture de la pêche, une période de fermeture plus longue de trois mois comme la disposition d'alternatives pour des moyens de subsistances ont été suggérés pour assurer une meilleure coopération avec les pêcheurs locaux.

REZUMAT: O reîntoarcere la valorile culturale ghaneeze ale sezonului închis de pescuit în sezonul de pescuit ghaneez artizanal: un mijloc esențial pentru restaurarea stocurilor de pești pelagici.

Sezonul de pescuit închis pentru pescuit artizanal costier este o măsură de management efectiv pentru refacerea stocurilor de pești. Studiul a urmărit evaluarea impactului sezonului de pescuit închis observat în portul Sekondi din Ghana. Rezultatele au relevat că perioada de închidere de o lună a fost prea scurtă și/sau lipsa unei supravegheri stricte pentru a realiza orice schimbare semnificativă a populației și dimensiunilor peștilor. O discuție transparentă privind o perioadă de închidere mai lungă de până la trei luni, precum și la furnizarea de surse de trai alternative au fost sugerate pentru a se asigura mai multă cooperare din partea pescarilor.

INTRODUCTION

The fisheries resources of Ghana have long been a pillar of the national economy, contributing significantly to socio-economic development (Adom, 2018a). The fisheries sector generates over US\$1 billion in revenue each year and accounts for at least 4.5% of Ghana's Gross Domestic Product (Dogbevi, 2015). With a marine coastline of five hundred and fifty (550) kilometres stretching from Aflao in the East to Half Assini in the West, the fishing industry plays a major role in sustainable livelihoods and poverty reduction in several households and communities (Mensah, 2009).

The sector also provides livelihood for an estimated 10% of the population representing about 2.5 million people who are employed directly or indirectly including their dependents. Significantly, fish constitutes 60% of the animal protein consumed in Ghana (Fisheries Management Plan of Ghana Marine Fisheries Sector 2015-2019). In the area of food security, fish is recognised as the most important source of animal protein in Ghana and is consumed by most people in all regions of the country from the rural poor to the urban rich. The role of the sector in terms of poverty reduction is very important. Many people rely on the fisheries sector either directly or indirectly for their livelihoods. Post-harvest fisheries activities clearly provide a wide range of full-time and seasonal livelihood opportunities to many vulnerable people. Employment in fishing and aquaculture has grown rapidly over the past few decades, increasing more than threefold from 13 million people in 1970 to over 41 million in 2004. Employment in the fisheries sector has grown more rapidly than both world population and employment in agriculture (Fig. 1). Most of this growth is in Asia, where over 85 percent of the world's fisher folk live, and is largely due to the expansion of aquaculture in this period (FAO, 2006; FAO, 1999).

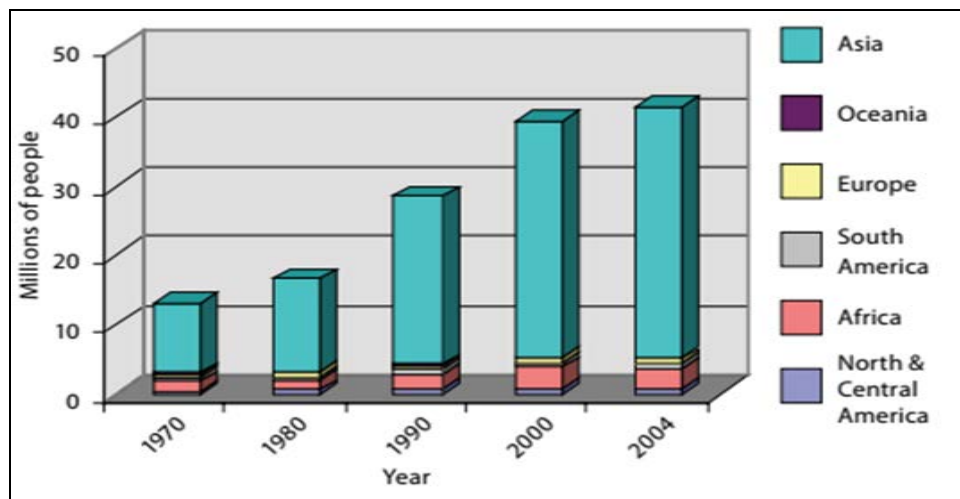


Figure 1: Employment in fisheries and aquaculture
Source: FAO (2006).

Millions of women in developing countries are employed in fisheries and aquaculture, participating at all stages in both commercial and artisanal fisheries, though most heavily in fish processing and marketing. In capture fisheries, women are commonly involved in making and repairing nets, baskets and pots, baiting hooks, setting traps and nets, fishing from small boats and canoes (Cambria, 2016). Greater percentage

of fish production is for export, around 40% of the global production being traded internationally, and exports from developing countries accounting for some 60% of this (Delgado et al., 2003). Human exploitation of fish and other aquatic animals such as crustaceans and mammals is virtually ubiquitous on Earth and since ancient times has provided humanity with food, income and other social goods such as recreation (Arlinghaus and Cooke, 2009). The fisheries sector provides a wide range of employment opportunities for many in the community. These are the fish harvesters, processors, traders, post-stick cutters, pot makers, boat builders, net makers, and ice suppliers. People also earn money by scaling and gutting fish.

Unfortunately, trawl surveys in Ghanaian fishing communities closer to the shores of the Gulf of Guinea show great decline in fish stock close to at least 50% (Afrolnews, 2004). USAID (2016) reports indicate that over a decade, the total marine fish landings declined while fishing effort continues to increase, and thus catch per unit of effort is getting lower, and sizes of landed fish are diminishing – a clear case of growth overfishing (Abreu et al., 2016). Scientific evidence has consistently shown that Ghana's marine fisheries are in crisis, with a decline in fish landings over the last decade. The European Union in 2013 warned Ghana by given her a yellow card for lack of legislative effort to fight unregulated fishing (Thiago and Mensah, 2014). There has also been weak enforcement and noncompliance with the fishery management measures. Reversing the trend of stock depletion to ensure food security for the present and future generations require bold and immediate policy and management actions (Fisheries Management Plan of Ghana Marine Fisheries Sector, 2015-2019). It is therefore, imperative to develop a strategic framework to terminate a further decline and rebuild the fish stocks through closed season fishing. There is little theoretical justification for seasonal closures in most instances. Temporal or seasonal closures may have both direct and indirect effect (Jim and Mark, 2007).

Overly depleted species have avoided apparent extinction due to seasonal closures is among the direct effects. Indirect effects resulting from proper application of closed seasonal fishing is that it protects resources that are vulnerable, causing improvement in economic returns when the market or resource conditions are poor, and restrict harvest during seasonal toxicity or unpalatability of some species (Casey and Myers, 1998). Seasonal fishery closures are commonly used in fisheries management for various purposes, including limitation of effort, protection of spawners, and maximization of the yield or value that can be obtained from a cohort (Watson et al., 1993). More specifically, closed seasons are often imposed during the breeding period of the targeted species in the belief that this will increase reproductive success (Arendse et al., 2007). Its purpose is to reduce catching power and fishing mortality by limiting the amount of fishing to a desired level, which would then supposedly increase stock size (Anderson, 2004).

The principle is based on biological returns, potential, allowing fish to reproduce during the breeding season before they are harvested (USAID, 2016).

Biologists have supported spawning area closures only to the extent that they have contributed to reduction of exploitation rate (Halliday, 1988).

There are many instances around the world where the implementation of a closed season has resulted in an increase of yield and higher economic returns to the fishing sector. In the U.S.A., almost all current fisheries management plans include a form of closed fishing season for commercial or recreational fisheries or both. For example, a closed season for *Tautogaonitis*, a slow growing demersal species, in 2001 in Narragansett Bay in Rhode Island, USA for two months during spawning season. The stock recovered in 2012, with the full rebuilding of the stock projected to be realized by 2016 (Rhode Island Division of Fish and Wildlife, 2015). In Senegal, a two-month seasonal closure in 2010 for octopus, has provided an approximately 35% increase in yield, and allowed the rebuilding of the stock to sustainable levels. Arendse et al., 2007 has reported that the frequent application of closed seasons to species that are not disturbed by harvesting and do not aggregate to breed is therefore generally invalid, despite wide belief that it improves reproductive successes. Seasonal closures have numerous documented failures, particularly when used as the only management strategy in a fishery (Jim and Mark, 2007). The most notable failures have been in large temperate fisheries, such as in the Pacific Halibut fishery and in the ground fish fishery off the New England coast (Sinclair and Valdimarsson, 2003). Seasonal closures are not deemed very effective and therefore alternative strategies are being implemented in which alternatives were more beneficial in the protection of threatened and endangered species (Federal Register, 2004). Culturally, Ghana has a culture for closed seasons for fishing shrouded in traditional beliefs (Adom, 2018b). These closure seasons are termed as nnabone, believed by societal members to be days when the ancestors are purported to perform some events in and around the shores of seas and rivers over some timelines (Adom, 2016) from 1st August to 1st December every year (Adom, 2018b). Interestingly, the fishing closure period coincided with the times when the fishes laid their eggs and/or nursed their young ones (Boateng, 1998). The period allowed considerable time for the fishes to regain their population through breeding and feeding. Watson et al. (1993) concurs that the duration for the fishing closure also affects the yield. He argued that a six-month closure starting from December or January could increase the value of the fishery by 5-10%, compared with a fishery with the same fishing pattern and no closure. However, there seems to be a cessation of the traditional cultural seasonal closure for fishing which was stipulated for longer periods of time in Ghana. Recently, the Ghana Ministry of Fisheries and Aquaculture announced a seasonal ban on fishing activities for a period of one month between the 15th of May to the 15th of June 2019. The ban has raised mixed feelings among the stakeholders in the fishing industry in Ghana. The preliminary research conducted by the researchers at in some fishing communities revealed that some fisher folks think the cessation of fishing for some period was not necessary as it stifled their economic gains during the fallow period. Others felt it was important as it would raise their yield eventually during the open season. Still, others felt that the period was too short to realize any significant increase in fish yield. Some of the workers at the Ministry of Fisheries and Aquaculture strongly felt that a revitalisation of the traditional culture of fishing closures for two to three months would increase field yield and restore the constant dwindling in the population of fishes in Ghana. The traditional authorities felt same but insisted that alternative sources of livelihood to support their poor fisherfolks. Therefore, this study was undertaken to assess the impacts of the closed fishing season of small pelagic fish stock observed within the period of 15th May 2019 to 15th June 2019 in the Albert Bosumtwi fishing harbour in Sekondi, Western Region of Ghana. The study was worth undertaking to help increase the fish stock for the small pelagic fish which is now in low population due to overfishing activities in Ghana. It would also help regulate the fishing closure seasons in Ghana so that the Ministry of Fisheries and Aquaculture Development could formulate resilient policies on fishing closures in the country.

MATERIAL AND METHODS

The study was a phenomenological study rooted in the field of cultural anthropology at Sekondi-Takoradi in the Western Region, Southern Ghana. The study was carried out over a five month period before and after the seasonal fishing closure from April 2019 to August 2019. The study was hinged in the qualitative research approach owing to the socio-cultural context (Denzin and Lincoln, 1994; Fraenkel et al., 2012) within which it was situated as well as its interactive nature. Private interviews, focus group discussions and participant-observant method of observation were used for the gathering of the data for the study. These data collection instruments have been proven to be efficient in Cultural Anthropology studies in soliciting for rich data on varying topics of investigation (Leedy and Ormrod, 2010). To prevent social desirability response set, the informants were told of the purpose of the study (Leedy and Ormrod 2010). Names of the participants were not inquired. However, pseudo-identification that allows anonymity of participants was used. The responses of the participants were coded and used in describing their views expressed in this paper.

The main objective of the researchers was to seek for more enlightenment on how the seemingly short closed season affected fishing stock and the fishing activity as a whole to suggest proactive ways of using this cultural closed season arrangement to boost the fishing population of small pelagic fish, the phenomenology research method was used (Pietkiewicz and Smith, 2014). Long participant engagement through lengthy interviews conducted by the researchers aided in capturing the thoughts of the participants comprehensively (Creswell, 2009). Purposive sampling was used in deliberately selecting the various categories of participants who were seen as key stakeholders in the fishing industry in Sekondi (Fraenkel et al., 2012) as well as those who knew the cultural values associated with the practice of closed fishing season amongst the people. They included fisher folks, fish mongers and traders, traditional authorities, workers at the Ministry of Fisheries and Aquaculture Development (MOFAD), as well as elderly residents from the age of 50 in Sekondi totalling a sample size of 51 out of the estimated 130 participants. Apart from the fishing leader of Sekondi, leading members of the fishing groups as well as the priests and chiefs of the sea, the other members interviewed were selected randomly. The Interpretative Phenomenological Analysis (IPA) was used for analyzing the final rich data on the phenomena studied from the respondents. Thick quotations from the responses of informants were used in constructing the meanings of the data generated (Fade, 2004; Smith and Osborn, 2008; Pietkiewicz and Smith, 2014).



Figure 2: Map of Sekondi-Takoradi (study area).

Table 1: Breakdown of interviewees; researchers' construct from field survey, 2019.

No.	Category of interviewees	Total number selected	Details
1.	Leaders of fishing groups	5	They were selected purposively and interviewed privately.
2.	Fish mongers and traders	18	They were selected randomly and interviewed in three focus group discussions.
3.	Traditional chiefs	2	They were selected purposively and interviewed privately.
4.	Traditional priest	1	He was selected purposively and interviewed privately.
5.	Elderly residents (50 years and above)	9	They were selected randomly and interviewed in six different focus group discussions.
	Young residents (below 25 years)	8	They were selected randomly and interviewed in two focus group discussions.
6.	Workers at the MOFAD	8	They were selected randomly and interviewed in two focus group discussions.
TOTAL SAMPLE		51	

DESCRIPTION OF THE PROJECT AREA

Sekondi-Takoradi is the fourth most populated metropolitan area in Ghana, the largest city and capital of the Western Region of Ghana and the hub for industrial and commercial activities with a population of close to six hundred thousand (Sekondi-Takoradi Metropolitan Assembly, 2017). The Dutch and the British built ports in Sekondi in the 17th Century that were destroyed by the Ahanta people in the Western Region (Ghana Web, 2019). Sekondi covers a land area of 219 km² and its the administrative headquarters of the Sekondi-Takoradi Metropolitan Assembly (STMA, 2017). It is located just 280 kilometres away from La Cote d'voire border to the West. The coastlines of Sekondi-Takoradi are fringed with coconut trees along the sandy beaches. The vegetation is both evergreen and moist semi-deciduous forest types rich in timber species.

The Albert Bosomtwi Sam Fishing Harbour was commissioned on the 2nd of June 1999 by the former president of Ghana Rawlings J. J. The harbour has a 200 m long breakwater and a 76 m long jetty with two wharfs for inshore vessels, an ice-making plant, ice storage unit, a shed for fish handling, water supply system and a fire fighting system (GhanaWeb, 1999).

As a fishing community, the main occupation in Sekondi is fishing with a larger section of the women engaged in staple crop production mainly for subsistence consumption. Though majority of the women do not engage directly in the fishing activity, they rather trade in the smoking and selling of the fish at the shores as fish mongers to market women to be sold in the markets.

RESULTS AND DISCUSSION

The findings presented and discussed under this section focuses on the main objectives of the study that aimed at assessing the benefits, challenges and suggestions for improving the seasonal closure for fishing among artisanal fisher-folks observed from May 15 to June 15 2019 at the fishing communities in the Sekondi Fishing Harbour in the Western Region of Ghana.

Wider publicity and proper consultation versus short notice and poor consultation on seasonal closure for fishing

Interviews with the older fisher-folks (all twelve of them, including the traditional chiefs and traditional priest) revealed that in the olden days when seasonal closures for fishing were cultural prohibitions, every member of the society knew of it due to their wider publicity and consultation. One of the traditional chief interviewed mentioned that it was a communal consultation. He told the researchers: A general community meeting was convened after prior information had been given. The traditional priest and his cabinet of elders discuss the closure period with the members of the society as well as the sanctions for breacking it. This included spiritual and physical punishments. These sanctions assisted the fisherfolks in making prior arrangements for alternative sources of livelihood before the closure period. (TC1, Personal Communication, 20th May, 2019).

The elderly fisherfolks, twenty out of the total twenty three, told the researchers in a focus group discussion that many of them engaged in farming activities during the closure period to cater for their families. They added that others also followed building contractors to work on their building projects to earn money to cater for themselves and their families. However, many of the fisherfolks interviewed admitted that they were not well informed of the May 15 to June 15 closure on fishing activities. In separate focus group discussions with the researchers, some of them admitted: We were given a short notice of the closure. Many of us did not make any plans on how to engage in other businesses to cater for our families. We had gone for loan facilities to engage in business during the closure period only to be told just two weeks to the closure period that there will be a ban on fishing. This specific situation has left many of us impoverished and in great debt (FF-1-FGD, Personal Communication, 18th May, 2019).

A section of the elderly fisherfolks (nine out of the 23) told the researchers that they had to ask their wards to stop schooling for the closure period because they couldn't fend for their schooling expenses due to the short notice of the fishing closure period. Eight young people interviewed expressed that they were at the receiving end of the economic hardship that came as a result of the unpreparedness of their fathers who are fisher-folks toward the seasonal closure for fishing. Three out of the eight said that they had to stop schooling for the half of the remaining semester because of failure on the

part of their fathers to pay for their school fees. Six out of the eight said that they had to engage in short term trading (selling items) and engaging in constructional activities and/or farming activities to support their families financially. These comments show that when wider publicity of seasonal closures are not given before their implementation, fisher-folks fail to make prior arrangements toward seasonal closures resulting in dire consequences.

Focus group discussions with eight workers at the Ministry of Fisheries and Aquaculture Development revealed that a year-long notice of the seasonal closure was given the fisher-folks before the implementation. They told the researchers of the then intention of the Ministry to observe the seasonal closure in 2018 but was resisted by the fishing communities and unions, claiming they were not reliably informed. The Ministry then called off the August 7th 2018 seasonal closure on fishing. The ministry then asked the fisher folks in several consultations to come out with new dates for the closure in 2019, of which they proposed the May 15 to June 15. They added that: The fisher-folks don't want to observe any seasonal closure for their fishing activities and thus came out with this date with the expectation that the ministry would ignore it. But, to their dismay, the ministry accepted it. Now, they are coming out with a false allegation that they were given a short notice and were not consulted' (MOFAD-FGD-1, Personal Communication, 20th May, 2019).

The views of the workers of MOFAD are justified in a news report by Joy FM in Ghana on the 10th of April, 2019 titled "Was the Fisheries Ministry coerced into accepting May 15 closed season?" Abubakar Ibrahim, one of their news reporters interviewed the sector minister, Hon. Elizabeth Afoley Quaye who shared similar views that the dates were given by the fisher-folks after extensive consultations with them. Thus, it would not be fair for the fisher-folks in the Sekondi Fishing Harbour to blame the ministry for not giving them more time to plan for the seasonal closure. The two traditional chiefs interviewed confirmed the position of the workers at MOFAD, concurring that the fisher-folks were well informed ahead of the time for the seasonal closure they proposed. Their lack of preparedness, according to the workers at MOFAD and the traditional chiefs was as a result of their expectation that the ministry would call off the seasonal closure since the timing was not within the dates the ministry endorsed. Judging from the larger section of the fisher-folks at the grassroot sharing the view of the short notice of the closure may suggest that the leaders of their fishing groups probably did not inform them earlier at the local level. There is still the need for greater education on the seasonal closure for fishing among the fisher-folks as many of them expressed negative views about it, having no knowledge about the benefits of the seasonal closures to fishing. The discretion of those who are relied upon to implement policy in the field is a key factor in its successful implementation (Burke et al., 2012).

The bottom-up theorists believe that centralized decision-making adapted to local conditions and flexibility is important to reach goals. This approach enhances democratic accountability and the ability of policy leaders to structure local behaviors (Landry, 2017). Therefore, the fisheries ministry must put up measures in ensuring that policy information reaches the grassroot, probably adapting the bottom-up approach in policy dissemination.

A step towards mutual understanding between the Fisheries Ministry and the other stakeholders in the fishing industry on appropriate periods for the seasonal closures

The workers at MOFAD disclosed to the researchers that they initially came out with dates for the seasonal closure on fishing which was from August 7th to September end in 2018. The August month was appropriate because it is scientifically proven that the popular fish stock *Sardinella maderensis* in Ghana's marine waters referred to as the "people's fish" breeds most during the month of August (Apetorgbor, 2018). The eggs produced by the older female fishes are bigger in size and hold greater potential of getting fertilized. Thus, it would be best to observe the seasonal closure within this period to allow the fishes to rest and spawn. Unfortunately, the fisher-folks revolted against the decision, blaming the Fisheries Ministry as being autocratic. To be a listening ministry, the sector minister asked the leaders of the fisher-folks nationwide to propose their dates for the seasonal closure. After deliberations with their members, they came out with the May 15th to June 15th. The post effects of the seasonal closure did not register very significant benefits in terms of fish stock and yield as the fisher-folks admitted to the researchers. Even before the observance of the seasonal closure date given by the fisher-folks, their leaders came back to suggest the initial date expertly given by the Fisheries Ministry. However, their plea was nullified because the closed season had to be observed this year (2019). Thus, the date given by the fisher-folks which was May 15th to June 15th was observed. After the seasonal closure in June end 2019 when the fisher-folks were interviewed, they suggested that the 2020 seasonal closure should be observed in the months of August and September. Some of the views they expressed in one focus group discussion were: "The May 15th to June 15th seasonal closure did not help us (artisanal fishers). We want it to be observed between August and September as we have heard that the fishes spawn and increase in their sizes and numbers. We want to get bumper harvest after the long fallow period during the seasonal closure" (FF-2-FGD, Personal Communication, 22nd June, 2019).

The Fisheries Ministry must immediately hold a consultative forum with all the stakeholders in the fishing industry to deliberate on the appropriate timespan for the observance of the seasonal closure. The Fisheries Ministry, being the sector ministry with the right expertise and mandated by law to manage the sector must well educate the fisher-folks on the need to stick to the months that they will get greater yield of fishes. Though they must not impose their views on the fisher-folks, they must reason with them on the need to accept the August-September closure period. This consultative forum must be done prior to the seasonal closure period in the following year. The proceedings of the meeting must be well disseminated especially at the grassroots level to the ordinary fisher-folk. This can be achieved if the Fisheries Ministry task the leaders of the local agencies and fishing groups in the various fishing communities as well as the traditional authorities and the local media houses to broadcast and discuss the seasonal closure periods and its benefits to the people. This would ensure that every stakeholder is well informed and educated so as to avert any last minute surprises and unpreparedness.

Benefits or no benefits of the one month seasonal closure for fishing

Admittedly, a considerable number of them (46 out of the total 51 participants) told the researchers that the one month closure was a vacation for fisher-folks to rest and for them to mend their nets and repair their canoes. In a focus group discussion, they told the researchers: “Many of us do not get adequate time to rest, drastically affecting our health. As such, the one month closer gave us ample time to go on vacation from our work to have considerable rest and relaxation” (FF-2-FGD, personal communication, 22nd June, 2019).

“Some of our colleagues are greedy and hardly spend time mending their nets and repairing their damaged canoes because of their constant use for fishing activities. The one month closure gave them the time to mend their torn nets that even reduced their catch at sea as well as in repairing their canoes” (FF-3-FGD, personal communication, 23rd June, 2019).

The main benefits of closed fishing season which are to control fishing, to increase the spawning potentials of fishes by protecting adults during the closure period and/or protect juveniles from extinction (Beets and Manuel, 2007) were not fully realized because of poor timing and lack of proper enforcement as noted in the responses of participants.



Figure 3: A fisher-folk at the Sekondi Harbour mending his fishing net during the closed season source: photographed by the researchers.

Duration of seasonal fishing closure versus strict compliance of the ban on fishing

All the fisher-folks interviewed said after the post seasonal closure that the sizes of fishes and their population remained the same. 18 out of 23, attributed it to the short closure period. The leaders of the fishing groups and the traditional authorities indicated that if the period will be longer, they will benefit by a greater fish yield and an increase in the sizes of the pelagic fishes. The traditional authorities mentioned that, their ancestors assigned two to three months for the seasonal closures, and suggested that collaboration between the Fisheries Ministry and other stakeholders in the fishing industry would lead to better decisions regarding the increase of the seasonal closure period from one month to two-three months. Examples can be gleaned from Phillipines that observe two months seasonal closure as well as Senegal that observes four months closure on the fishing of octopus and small pelagics with increase in fish yield (Zaney, 2019). Guinea, Mauritania, Morrocco, U.S.A. observe closures for over a month.

Other participants held contrary view. They said that the problem was not with the duration for the seasonal closure but ensuring strict compliance of all the stakeholders in the fishing industry. The leaders of the fishing groups registered their displeasure for the weak supervision of the closed fishing season. One of them told the researchers: "Some foreign nationals (Chinese) engage in fishing despite the ban. It seems they have support of some of the workers at the Fisheries Ministry. If this discrimination attitude is not halted, nothing good will come out of the seasonal closure" (FL-PI-3, personal communication, 10th June, 2019).

Therefore, though longer time for seasonal closure observance is key to replenishing the low stock of fishes, strict compliance to the ban must also be ensured to enjoy the full benefits (Scheer and Moss, 2017).

Misinformation and lack of information on government fishing policies among the ordinary fisher-folk

Ninety-eight% (22) of all the fisher-folks interviewed in this study, including four of the leaders of the local fishing groups, were not aware of the full government policy on the seasonal closure on fishing. They knew of only the seasonal closure on artisanal fishing. As such, they felt that they were discriminated against because of their impoverished state. They disclosed to the researchers that they saw many times the industrial trawlers and tuna operators working on the sea while they were asked to observe the closed fishing season. Some of them said to the researchers: "We see the boat fisher-folks (industrial trawlers) and tuna operators working though all of us have been asked to observe the seasonal closure on fishing. The authorities look on and do not prosecute them. Some of us would also revolt against the seasonal closure and go for fishing" (FF-2-FGD, personal communication, 21st May, 2019).

Their comments clearly show that they were not reliably informed of the government's policy on seasonal closures for fishing. However, the industrial trawlers and tuna operators have different periods that they would observe their seasonal closures. Tuna operators' seasonal closure was from January 1st to February 30th while industrial trawlers seasonal closure starts from August 1st to September 30th. Their view shows clearly that education on government policies regarding fishing should be intensified especially at the grassroots level. This is very crucial for these fisher-folks in helping in the implementation of the policies because lack of information and/or misinformation can propel many of them in usurping the policy directive on seasonal closures for fishing.

Making alternative arrangements for fishermen during the seasonal closure

The government of Ghana has shown her commitment in helping fisher-folks in their traditional business. One of such specific assistance is with the provision of subsidies on premix fuel for artisanal fishers (Sackey-Mensah, 2012). Interview with the fisher-folks show that they can wholeheartedly support the seasonal closure even if it is extended to two or three months only in condition that the government would offer them alternative sources of livelihood during the seasonal closure period. When the researchers asked them the kind of support they would expect from the government, these were some of the responses: "The government can support us with the setting up of cold stores for selling fishes during the seasonal closure period to help us cater for ourselves

and our families” (FF-1-FGD, Personal Communication, 5th June, 2019). “The government can support us with chemicals and other farming equipment to assist us in our farming activities during the seasonal closure period” (FF-2-FGD, personal communication, 21st May, 2019). “The government through some of the financial agencies could offer us soft loans with low interest rates to aid us engage in small-scale enterprises and/or trading to support ourselves and our families. Otherwise, during the closed seasons, we will be impoverished” (FF-3-FGD, Personal Communication, 28th May, 2019). “The government should make arrangements to offer us some allowance packages to help us fend for ourselves and our families during the seasonal closure” (FF-2-FGD, Personal Communication, 21st May, 2019).

Similar sentiments were expressed by the chief fisherman of Kokrobite in the Ga South Municipal Assembly in the Greater Accra Region of Ghana who requested the government of Ghana to make appropriate arrangements for alternative sources of livelihood for the fisher-folks before the implementation of the seasonal closure period on fishing (Business News, 2018). The workers at MOFAD concurred that such specific incentives and continuous support offered to the fisher-folks during the seasonal closure period would help them in supporting the policy as they would not be tempted in any way to breach the directive because of financial hardships. The demands of the fisher-folks and the workers at MOFAD in Ghana is not misplaced because similar plea and arrangements for alternative sources of livelihood were made for the fisher-folks in Myanmar during their annual three months seasonal closure on fishing (Global New Light of Myanmar, 30th May, 2019).

In thinking of the kind of alternative sources of livelihood that can be provided for the fisher-folks, the government of Ghana can pick lessons from what other countries are doing. For instance, in Sri Lanka, the government decided to diversify the income generating activities of small-scale fisher households such as promoting sustainable home gardening activities (RFLP, 2011). In addition, vocational training program on coconut oil processing was introduced since there are large coconut plantations in Myanmar (Haritha et al., 2013).

General challenges expressed by fisher-folks on bad fishing practices that need immediate redress

The major concern of about 23 out of the 25 (97%) of the fisher-folks was with the bad fishing practices that are carried out in the Albert Bosumtwi fishing harbour. They mentioned the use of light for fishing as well as the use of deadly chemicals such as DDT, Sodium cyanide, carbide and dynamite for fishing. Many of the fisher-folks stated that they noticed these bad fishing practices among the foreign nationals especially the Chinese. They said that the authorities look on as the foreign nationals engage in these unhealthy fishing activities. Some even said it may be because the Chinese fisher-folks have bribed the workers of MOFAD who are not applying the stricter punishments on them. However, when their colleagues engage in these same foul practices, they immediately cease their canoes.

When the workers of MOFAD were questioned on this, they dismissed it saying that the sanctions were applied on both local and foreign nationals, mentioning the prosecution of some Chinese who were found engaging in light fishing. Yet, over 50% of the participants in the study insisted that the fisher-folks who engage in these illegal fishing practices are not prosecuted. As a result, it is on the ascendancy. One of the leaders of the fishing groups told the researchers: “Most times when we report such incidences, the culprits are freed because they have the support of someone in the fisheries department

or in government. If this favouritism attitude is not erased completely in the fishing industry, these illegal fishing practices would continue" (FL-PI-3, Personal Communication, 10th June, 2019).

Weak enforcement of fishing policies and sanctions as well as the frequent corruption among those in authority (Scheer and Moss, 2011) has been the constant bane behind the slow pace of development in the Ministry of Fisheries and Aquaculture Development in Ghana.

The Fisheries Ministry must liaise with the security agencies in the country and ensure the full implementation of the Regulations (10-21) of the Fisheries Regulation, 2010 (L. I. 1968) that aims at prosecuting all persons who engage in illegal, unreported and unregulated (IUU) fishing activities such as light fishing and the use of dynamites and poisons.

This fisheries act should be implemented to the fullest with no favour or whatsoever to anyone including governmental officials who hide behind the screens to support fisher-folks to engage in these unproductive activities in the fishing industry. One of the leaders of the fishing groups told the researchers that Ghana should learn from Togo and put up stricter measures in prosecuting all fisher-folks who engage in light fishing, aiding in completely rooting out these bad fishing practice in the country.

The researchers were told that the fisher-folks use light to attract the fishes. Also some fishers use the DDT and other chemicals in a bid to maximize their fish yield.

However, these practices have very dire consequences to the health of the aquatic ecosystems, fishes, the humans that consume the fishes and on the economic gains of the fish mongers (Curtean-Bănăduc et al., 2016). All the eighteen fish mongers and traders interviewed said that the use of the poisonous chemicals caused the fishes to rot speedily, few days after their catch, making them incur huge debts. Those who roast some of the fishes (*Tilapia – Oreochromis niloticus*) for sale said that when heat or smoke is exposed to the fishes caught using poisonous chemicals like DDT and cyanide; they break into pieces, negatively affecting their sales and prices. In terms of the health of the fishes, they look discoloured with broken and sunken eyes, making their consumption hazardous as buttressed Bentill (2014). Mak et al. (2005) mentions that when cyanide is used for fishing, fishes suffer chronic toxicity, exposing them to stress and damage with eventual death. In addition, the consumption of the fishes with large quantities of DDT can cause serious havoc to the nervous system (Bentill, 2014; Afoakwa et al., 2018).

Therefore, strict enforcement of sanctions against all forms of illegal fishing activities must be ensured by the Fisheries Ministry in collaboration with the law enforcing agencies in Ghana.

CONCLUSIONS

The Ministry of Fisheries and Aquaculture Development in Ghana has done well in implementing the closed season act which has been left behind for so many years despite it being part of the cultural fibre of the Ghanaian people. MOFAD in accordance with sections 76(3) and 84 of the Fisheries Act 2002 (Act 625) has been able to implement the seasonal closure for fishing in 2019 though with some considerable setbacks. This study aimed at assessing the impacts of the closed fishing season for artisanal fishing that was observed within the period of 15th May 2019 to 15th June 2019 in Ghana, with the Albert Bosumtwi fishing harbour in Sekondi, Western Region of Ghana as a case study. The study has shown that the projected benefits of the seasonal closure were not fully realized because of the relatively shorter period of observance, the lack of strict supervision, and the lack of effective dissemination of the government policies on the seasonal closure. For effective implementation of the seasonal closure for fishing in the coming years, the study contends that the Fisheries Ministry must ensure close talks through consultative forums with all the stakeholders in the fishing industry especially the grassroots fisher-folks so that government policies on seasonal closures for fishing could be well disseminated. Amicable dates that would aid in increasing the fish yield and sizes must be discussed during the consultative forums organized by the Fisheries Ministry. Also, very strict supervision approaches must be adopted by the Fisheries Ministry in prosecuting all fisher-folks and other persons who flout the seasonal closure. The sanctions must be stricter to serve as deterrent for others who would want to walk that unhealthy path. Moreover, the law enforcing agencies must assist the Fisheries Ministry in enforcing the stricter sanctions on fisher-folks who engage in bad fishing practices such as using light and other poisonous substances in fishing. When close measures are taken by the Fisheries Ministry in implementing these proactive suggestions, it would lead to better and more beneficial seasonal closure observance for artisanal fishing activities in Ghana.

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