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IMPACTS OF MARINE LITTER ON THE LIVELIHOOD OF FISHER-FOLKS IN COASTAL COMMUNITIES: THE CASE STUDY OF SHAMA FISHING COMMUNITY

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Abstract

Purpose — The study aimed to assess the impacts of marine litter on the livelihood of fisher folks in the coastal communities of Shama. Purposive sampling technique was used to survey 60 respondents of fisher folks at Shama.

Methods — Questionnaires were used to collect data and subsequently analyzed with the use of Microsoft Excel 2013 and Statistical Package for Social Science version 26 (SPSS) and results were presented in a table and charts.

Findings — The study identified that more than half of the respondents (57.4%) strongly agreed that marine litter affects the number of fish caught, while 29.6% of respondents agreed that marine debris affects the number of fish caught, whereas 5.6% disagreed.

Conclusion & Recommendation — The study revealed negative effect of marine litter on the smooth operations of fishermen activities and this is greatly affecting profit made by fishermen in Shama fishing community, Ghana. Hence, it is therefore recommended that the government help provide dustbins around the sea shores, strengthen education on the impact of marine littering amongst other proposed solutions by respondents.

Keywords — Fish catch, Shama, time for Fishing, coastal environment

Introduction

Water pollution is a result of substances interacting with water in a way that alters its physical, chemical and biological qualities. This destroys its natural structure and has a negative impact on the health of

humans and other living things. Any durable, produced, or processed material that has been dumped, disposed of carelessly or eventually winds up in the sea or coastal environment is referred to as marine litter. In recent decades, marine debris has grown to be a significant global environmental concern. It is now well acknowledged that there is a sizable amount of this type of garbage, and it is increasing (Galgani et al., 2019). On a worldwide scale, litter has a significant negative influence on marine and coastal ecosystems. Plastic waste makes up between 60% and 80% of this litter, which is then dumped in the seas and oceans (Barboza et al., 2019). Plastics originate from both terrestrial and marine sources, and their ongoing buildup in aquatic ecosystems has negative economic and ecological effects (Thushari & Senevirathna, 2020; UNEP, 2014). However, this affects the abundance of aquatic species present in the marine ecological system. The fishing industry is just one of the many that are adversely affected by marine plastic waste. The productivity, viability, profitability, and safety of fisheries and aquaculture are all impacted by marine pollution (Beaumont et al. 2019). These effects may result from damage to boats and fishing equipment, marine debris and plastics captured in nets, and other factors. This may have an immediate effect on fish stocks. Beyond these monetary repercussions, this food source's quantity, quality, and safety have a significant adverse impact on human health and well-being (Golden et al. 2016). A major environmental concern is a marine debris, of which between 61% and 87% are plastics (Barboza et al. 2019). Between 4.8 million and 12.7 million metric tons entered the waters in only 2010. According to Jambeck et al. (2015) these particles are thought to be present in at least 5 trillion particles in total (Eriksen et al. 2014). About 358 million tons of plastics were manufactured worldwide in 2017 (Plastics Europe, 2018). In the following two decades, it is anticipated that the number of plastics produced would double (Geyer et al. 2017). Large amounts of continental plastic waste are released straight into the ocean by ships or dumped on shorelines during recreational activities. Mismanagement of solid waste in many coastal nations has resulted in 1.8% to 4.6% of the total plastic garbage produced ending up in the ocean (Jambeck et al. 2015). Marine debris frequently alters the coastal landscape, reducing the attractiveness of the area as a tourist destination. Beyond the aesthetic effects, marine litter may have economic repercussions for maritime industries like fisheries and aquaculture (UNEP, 2014). The marine environment and other elements of many ecosystems are impacted by marine pollution (Barboza et al. 2019; Gall & Thompson, 2015; Galloway et al. 2017; Rochman et al. 2016). Plastic waste is an important source of chemical additives that easily seep into the water, some of which are known to have endocrine-disruptive effects. Large, breathing sea animals, including rare species, are at risk because fishing gear might entangle them accidentally (Lusher & Hernandez-Milian, 2018). Plastic garbage predominates in the oceans and along the coast mostly due to its low density, which makes it easy for ocean currents to carry it along, and the fact that it is difficult to disintegrate in the environment. Marine litter has a detrimental effect on the environment, the economy, and people. The accumulation of plastic trash and the degradation of aquatic habitats are just two examples of how the presence of plastic waste in the ocean may have an adverse effect on physical, chemical, and biological factors. Therefore, the study aimed to assess the impacts of marine litter on the livelihood of fisherfolks in the coastal communities of Shama

Materials and Methods

Study Area

Shama is a town with a fishing village and is the capital of the Shama district, a district in the Western Region of Ghana. Shama, one of the fourteen (14) districts in the Western Region of Ghana was the site of the study. Located in the Ahanta East Metropolitan Assembly, it is situated between Latitude 1.38° West and Longitude 5.1° North. The town lies about 20 km east of Sekondi-Takoradi, on the mouth of the Pra River. The inhabitants of the town are mostly engaged in fishing and its related activities such as fish

processing for local markets. Shama is the sixtieth most populous settlement in Ghana, in terms of a population of 23,699 people. Shama is the English name of the town, originally and locally called Esima.

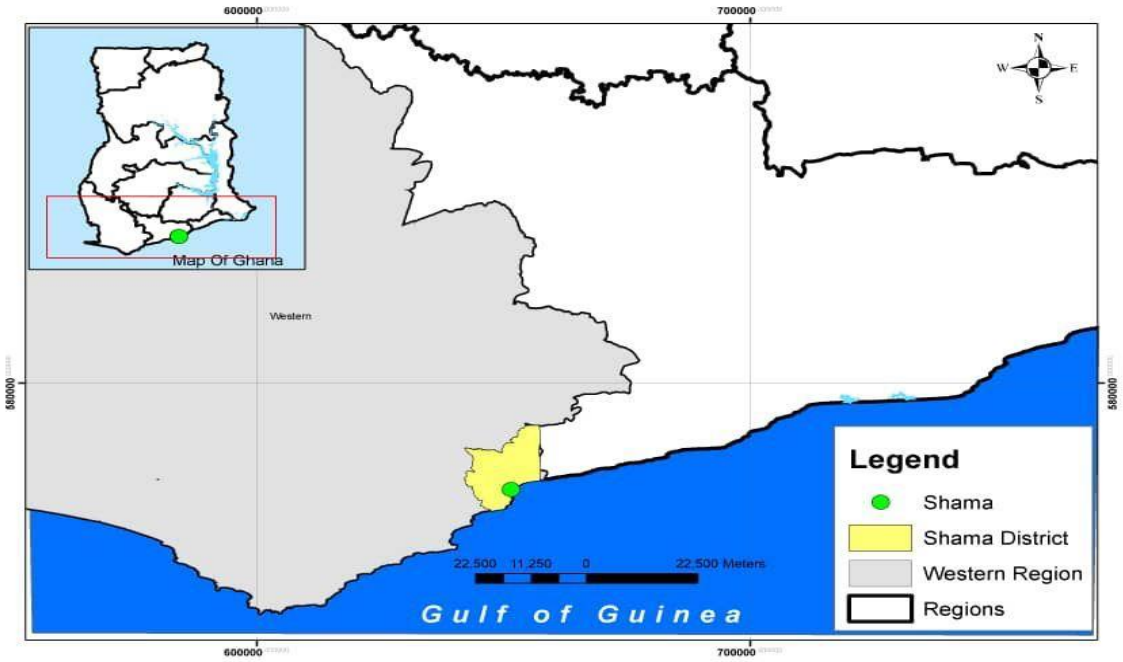

Fig. 1: Map of Shama showing the study area

Data Collection and Statistical Analyses

The study employed purposive sampling technique to select 60 fisher folks. Purposeful sampling technique is widely used to recruit respondents who can provide in-depth information about the phenomenon under study (Patton, 2002). Data collection process involves several activities such as "locate the site and the individuals, gaining access to the site and making the connection, sampling purposively, collecting data, recording information, exploring the fixed issue and storing the data (Creswell, 2013). To ensure the comprehensiveness and objectivity of the research, a self-administered questionnaire was used to solicit data from 60 respondents through a qualitative data collection method. For the demographics, results were presented in frequency tables and percentages.

Data Analysis

A descriptive analysis (i.e., frequencies and percentages) was done using Statistical Package for Social Science version 26 (SPSS). The frequencies and percentages were then transported to Microsoft Excel (2010) to generate the graphs.

Results

Demographic Characteristics of Respondents

Table 1: Socio-demographics of Respondents

Demographic Characteristics	Percentages (%)
Gender	
Male	94.4
Female	5.6
Age	
20 or less	5.6
21- 30	27.8
31 – 40	31.5
41- 50	18.5
51-60	14.8
61 and above	1.9
Marital Status	
Married	61.1
Single	29.6
Separated	5.6
Divorced	1.9
Widow /Widower	1.9
Number of Children for respondent	
0-1	37.0
2-3	29.6
4-5	24.1
6-7	1.9
8-9	7.4
Religion	
Christianity	79.6
Islam	9.3
Others	11.1
Educational Status	
Non- educated	29.6
Basic	57.4
Senior High School	11.1
Tertiary	1.9

The results show that 94.4% of the respondents were males while 5.6% were females (Table 4.1). As shown in Table 4.1, 31.5% of the respondents had attained ages ranging from 31-40 years whiles 61 years and above constitute 1.9% of the respondents. The study however revealed that 61.1% of the respondents were married whiles 29.6% were single (Table 4.1).

Impact of Marine Litter on the Length of Time for Fishing

According to the survey, 74.1% of respondents strongly agreed that marine debris affects how much time fishermen spend fishing (Figure 4.1). Figure 4.1 shows that 13% of respondents agreed that marine litter

affects the amount of time spent fishing, whereas 3.7% disagreed that marine litter affects the amount of time spent fishing by marine fishermen (Figure 4.1).

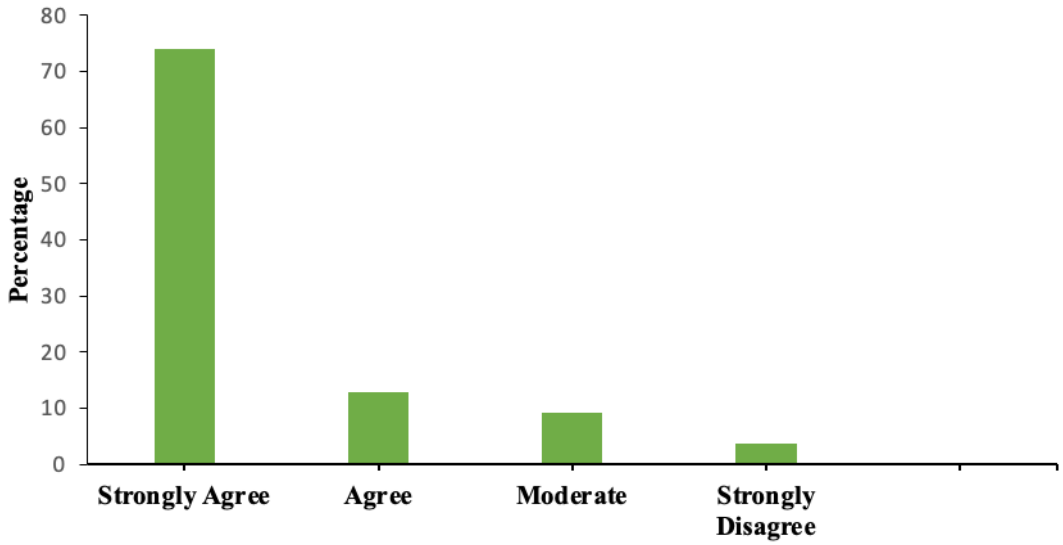

Fig. 2: Impacts of Marine Litter on Duration of Fishing

Impact of Marine Litter on Volume of Fish Catch

The study highlighted that 57.4% of the respondents strongly agreed that marine litter has an impact on the volume of fish catch. (Figure 4.2). According to Figure 4.2, 29.6% of the respondents agreed that marine litter has an impact on the volume of fish catch whiles 5.6% of the respondents disagreed that marine litter has an impact on the volume of fish catch (Figure 4.2).It affects the duration of fish catch because usually fishermen sometimes catch liters instead of fish.

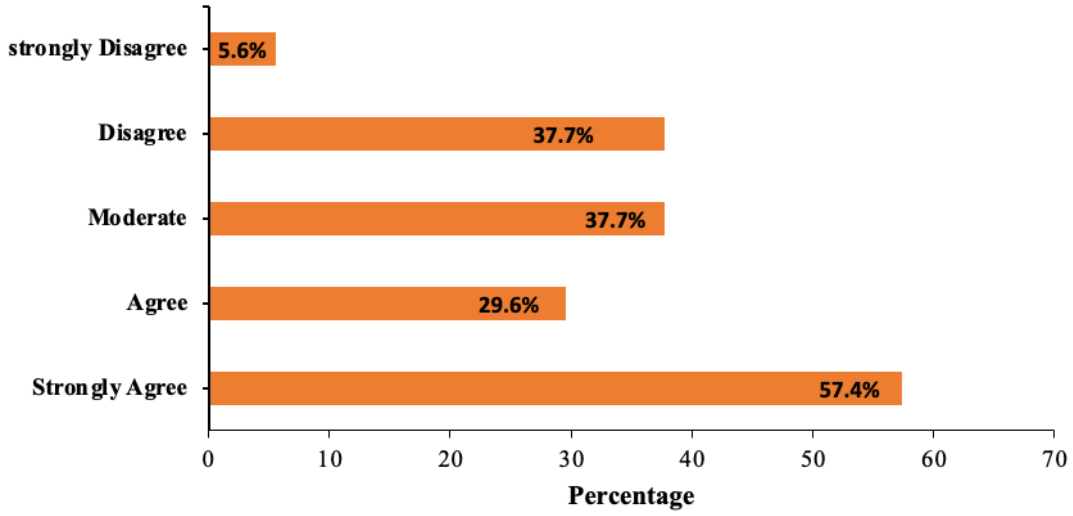

Fig. 3: Perceived Impacts of Marine Litter on Volume of Fish Catch

The Type of Marine Litter at Shama Fishing Community

The study highlighted that 51.9% of litter found in the Shama fishing community was plastic waste (Figure 4.3). According to Figure 4.3, 37% of the litter found at Shama was domestic waste while 11.1% of the litter was non-domestic waste. Some examples of plastic waste include; food wrappers, cups, beverage bottles, plastic bottles etc., domestic waste also include; food waste, plastic, textiles, glass etc., and non-domestic were sanitary waste, trucked liquid waste, storm water, uncontaminated water etc.

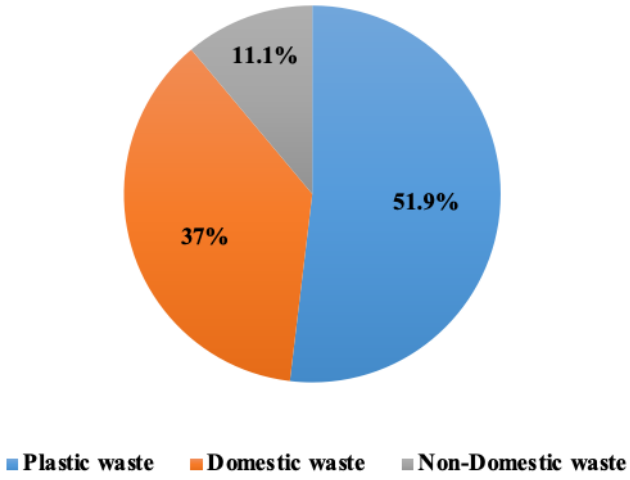

Fig. 4: Types of Litter

Solutions to Reduce the Impact of Marine Litter

The study highlighted that 57.1% of the respondents suggested that the provision of dustbins can be the solution to reduce marine litter (Figure 4.3). According to Figure 4.3,12.2% also suggested that regular cleaning - up exercise can be the solution to reduce marine litter while 4.1% also suggested that building toilet facilities could reduce marine litter.

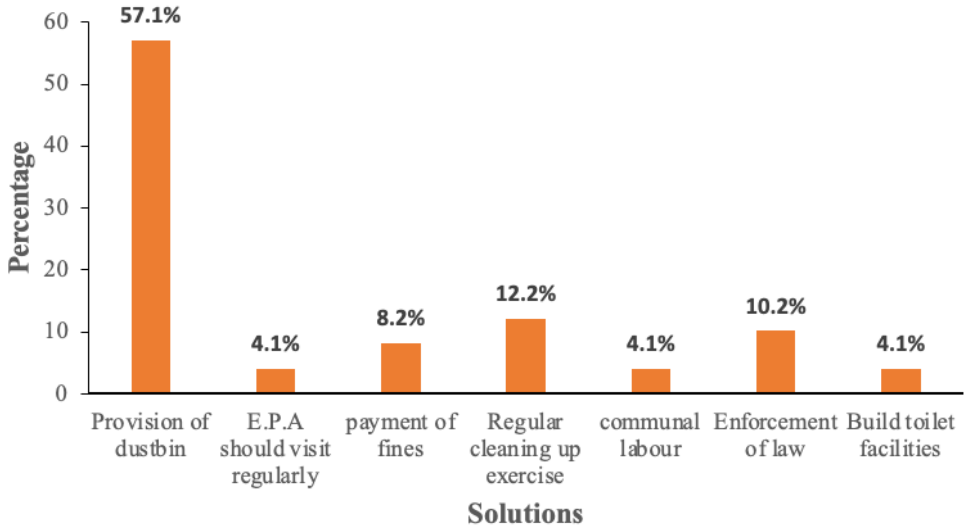

Fig. 5: Perceived Solutions to Reduce the Impact of Marine Litter

Discussion

Demographic Segregation of Respondents

Male respondents made up 94.4% of the preceding chapter's respondents, while female respondents made up 5.6%. Fishing is perceived to be for men; however, men are more involved in Ghana's fishing sector. This was the reason for low participation of females in the study. The educational background of respondents was purposefully initiated into the research to help assess what respondents perceive or think about marine litter.

Impacts of Marine Litter on Length of Time for Fishing

Majority of the respondents strongly agreed that marine debris influences how much time fishermen spend for fishing due to the migration of most fish species to unpolluted environment. These findings contradict to FAO (2016) who revealed that marine debris has no influence on fish distribution but has a significant effect on length spent on fishing; activities such as clogging of pedals of outboard motors and destruction of nets of fishermen. According to OSPAR, (2007); little amount of marine debris allows fishermen time on harvesting of fish by limiting the amount of time spent untangling litter from fishing nets. However, Fossi et al. (2018) reported that, different fish species in marine areas are affected, prompting those species to swim far away as a means of avoiding hazardous compounds and also seeking out a healthy environment. This hypothetical situation accurately depicts how fishermen will spend more time at sea when they are actually fishing or performing their finest work.

Impact of Marine Litter on Volume of Fish Catch

In the study, it was observed that majority of the respondents strongly agreed that marine litter affects the number of fish caught. This agrees with the result of Alkemade et al. (2009), litter in the maritime environment has a variety of detrimental effects on the environment, society, economy and public safety. Despite the diversity of these effects, they are frequently interconnected and dependent on one another. Given that this particular argument relates to the first, which is about the effects of marine litter on fishing time, it can be claimed that marine litter affects fish harvest. From the result of this study, as marine trash production increases, fish harvest volume similarly decline. This decline could be caused by a variety of things, including the species diving deep into the area and contaminated water bodies that kill or severely restrict the population of the species.

The Type of Marine Litter at Shama Fishing Community

The survey in this study revealed that plastic garbage made up most of the litter in the Shama fishing community. Plastics dominate marine litter and pose a serious threat to the marine environment, according to Thompson et al. (2009), because of their prevalence, longevity in the marine environment, and capacity to travel great distances. Due to the high volumes of garbage discharged and inappropriate disposal, domestic trash has emerged as one of the major issues seriously harming the marine and offshore environments. Non-domestic waste accounts for only 11% of waste at Shama. It may be produced as a byproduct of running a nonprofit organization or conducting business, including related lawn and garden clippings from routine upkeep of the business location. The commercial waste also comprises garbage generated by a company's clients (e.g. food wrappers and containers).

Perceived Solutions to Reduce the Impact of Marine Litter

According to Hargreaves (2003), young people have the ability to change their behaviors relatively easily and can also spread this awareness to their families and larger communities, acting as change agents. Law enforcement is one of the proposed solutions from the results of this study. The institution of law enforcement is changing significantly within a dynamic operational environment, according to Cowthray et al. (2013). Numerous investigations and commissions have been conducted on law enforcement, which has revealed significant levels of corruption in many countries. The provision of trash cans or dustbins is a necessary but frequently overlooked solution that will help combat marine litter. It is acknowledged that having dustbins nearby will be a better solution to prevent litter, especially marine litter. In order to ensure that measures are put in place to reduce litter if it is impossible to be eliminated, the Environmental Protection Agency should thus examine sites often. According to Beaumont et al. (2019) evaluation entails examining the applicability, efficacy, efficiency, and impact of actions in the context of stated goals (2000). Other anticipated remedies, which were not stated previously, include doing communal work, constructing restrooms, and other things, and they all have the potential to reduce marine trash at Shama.

Conclusion and Recommendations

Regular cleaning-up exercise by the relevant government agencies will help reduce the menace of plastic waste on marine waters of Ghana. Hence, easy access of fishermen navigating marine waters with their fishing vessels will be made easier for more volume of fish catch. This will invariably enhance the livelihood of fishermen. Marine debris significantly affect fishing in Ghana, fishermen spent much time at sea due to the decline of fish species and the destruction of fishing nets and outboard motors. Fisheries play a significant role in Ghana's economy contributing to the livelihoods of many fishing communities. Marine litter has a negative impact on volume of fish catch; this affects the livelihood of fishermen due to low income.

To mitigate the impact of marine litter on fishery resources, there is the need for efficient waste management system that can prevent litter from entering the marine environment. Also, there is the need to enhance community education to help change the attitude of coastal communities to prevent marine pollution. Finally, there is a need for more research works on the impact of marine debris on fishery resources in Ghana. It is therefore recommended that the government, Environmental Protection Agency (EPA) and Zoomlion Ghana help provide dustbins around the sea shores, strengthen education on the impact of marine littering amongst other proposed solutions by respondents. Further studies must be conducted by Environmental Protection Agency (EPA) to assess the impact of marine littering on economic condition of fishing communities in Ghana.

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