

From fish to cash: Analyzing the role of women in fisheries in the western region of Ghana

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ABSTRACT

Though many publications on women in fisheries in coastal areas are available on a global scale, still little information pertaining to women fisheries in Ghanaian coastal communities exist. This paper is therefore based on the premise that women's roles and contributions to the fishing industry in Ghana are under-recognized, poorly documented and under-acknowledged in management discussions. This study is intended to bring to bear the diverse contributions that women make in Ghanaian fisheries - as women's needs and interests are often overlooked in interventions and policies. This non-inclusion could lead to policies and interventions missing their target of creating sustainable livelihoods based on marine resources. The objective of this study therefore is to fill an important gap in fisheries management information, critical for decision-making processes geared towards more sustainable ocean-based livelihoods. The primary objective of this paper is to analyse the role of women in fisheries livelihood within the context of their scale of operations and fish distribution networks. Interviews were conducted in two fishing communities in the western region of Ghana to assess the constraints that impede women's development within the fisheries sector, analysing their dependency on the fisheries resource as a livelihood and some interventions proposed for the improvement of their livelihood is discussed.

1. Introduction

Women involved in fisheries worldwide play a wide range of roles along the fisheries value chain, making significant contributions to livelihoods and industry (Zhao et al., 2012). The structure of women's roles in fisheries differs across countries, industries, regions and communities but their importance in the fisheries sector is pronounced [1]. Women are essential players in production, processing, marketing and management of fish and other living aquatic resources [2–5]. In addition to their roles, women perform family tasks such as daily household chores, child care, care of food needs at home including meal preparation and caring of the elderly [6]. Notwithstanding the performance of these central roles of women in fisheries, their participation before and after fish capture activities has been given little importance, leading to the near invisibility of women as contributors to this sector [7]. Their roles in the fisheries value chain are often unpaid tasks and are not seen as employment, thus invisible in fisheries management plans and fisheries statistics [8–10]. The existing information about women-centered

fishing industry is inadequate in official statistics (except for processing), hence documentation of women's formal participation in fisheries is low, especially in capture fishing (Zhao et al., 2012). There is no reliable and accurate central database indicating a computed number of women engaged in the fishing industry globally (Zhao et al., 2012; [11]. The 2014 and 2016 FAO biennial report on 'The State of World Fisheries and Aquaculture' confirm this as well. The Food and Agricultural Organization of the United Nations (FAO) collects gendered primary employment data since 1995, but is obliged to make approximations due to unspecific reporting by many of its member states [8]. A recent report estimates that globally, women make up half of the combined workforce of primary and secondary fisheries sector engagements [12]. As reporting on women involvement in fisheries sectors improve and policies directed at increasing decision-making capacities of women in the sector, it is expected that data on women's contribution in the sector could be enhanced ([53]: 33). The work women engage in is often low-paid or unpaid, often with unofficial status, and this is a barrier to access to financial resources and policy support for these women [53].

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Improved statistics for both industrial and small-scale operators, together with data on the secondary post-harvest and service sectors, would greatly improve the understanding of importance of women's contribution to fisheries and aquaculture, food security and livelihood [53].

Acknowledging the intrinsic contributions of women in fisheries is not new in literature [5,13–21], and in recent times, gender dimensions of fisheries is gradually gaining popularity at the international level [12, 22–24]; yet women are still marginalized in access to and control over fisheries resources in many parts of the world [20,25].

In most developing countries, formal statistics rarely reveal the extent and nature of the contribution of women to men's pursuit of fisheries as a livelihood [26], however, without women's vital efforts, men might not be fishing at all [26]. What's more, 'fisheries' is often equated with 'fishing', and all shore-based works often the work of women remain unnoticed and unaccounted for [8].

West African women have always contributed immensely to all areas of economic and social lives of their families and households, as farmers, entrepreneurs, traders, workers, home makers, mothers and many more. They make noteworthy strides in all aspects of the economy especially in the agriculture and services sectors [27]. In marketing, they play key roles as petty traders, marketing foodstuffs and consumer goods. Stories are told locally of the existence of a group of West African entrepreneurial women who made their brand internationally known by trading in wax printed cloth [28]. These women were among the country's richest as they imported fabric from Dutch companies and distributed it throughout West and Central Africa. They were known as "Mama Benz" because they made so much money that they could afford Mercedes Benz cars. The phrase "Mama Benz" symbolized the pride, achievement and success of these women. The question then is whether there will be a group of "Mama Fish" or "Mama Boat"? Like in other fisheries worldwide, female participation in West African fisheries is more diverse than often assumed, but traditionally, fisheries have been associated with masculinity conveying the assumption that fishing is only done by men [8,10,29–32] with a strong and persisting focus on capture fisheries. The fisheries in coastal West Africa is largely artisanal and mostly undertaken for both commercial and subsistence purposes. For instance, in Senegal and Ghana, the artisanal sub-sector lands 80% and 70% of fish respectively [33]. Ghana like Senegal has a similar fish value chain system where men go out to fish and women take charge of the post-harvest catch and its distribution [34].

Women in coastal Ghana are crucial actors in fisheries as they are largely responsible for the processing and marketing of fish - they work on the shores or in the coastal villages smoking, drying, salting or fermenting fish. Many women sell fresh or processed fish in local markets while others as reported by Overå [35]; do more than sitting behind baskets of fish in market places. Some are able to cross the gender-defined division between fishing and marketing to be owners and financiers of fishing canoes in addition to being processors and traders. If women are that crucial to the fishery sector then their roles, needs and market networks should be well acknowledged, understood and documented. Unfortunately, most development projects, fisheries management and policy formation have often overlooked post-harvest and trading activities of women, disregarding that the connection between fishing and trading is critical [26]. As many interventions focus exclusively on fishing activities, such as regulating catch, gear and access rights, rather than on improving processing and access to markets [26]. The fishery roles of women although having significant economic and social value, are being looked upon as an extension of the domestic space (Zhao et al., 2012). Generally, most women in Ghana are primarily in charge for agricultural processing, either together with men or alone [36], as such marketing of agricultural products becomes an extension of this role [37]. Consequently, in fishing communities, women are largely responsible for processing and marketing of fish [38,39] and this role of women in fisheries is ingrained in the culture of their communities through the structuring of their tasks and norms for accessing resources

[37]. Thus, it is typical to find women who consider the roles they play as an extension of their household chores [40]. However, the fishery is a multifaceted task and involves a collective set of activities - harvesting, processing, distribution and consumption, in addition to the understanding of where, how and by whom fish are harvested, processed, distributed and consumed, which is important for understanding how the fishery functions [41]. As such, fishing should not only consider the one who goes out fishing, but all of those involved in the process between the capture of the fish and the consumer's plate in order to get a comprehensive picture of the fisheries value chain [41].

To date, there is relatively little information concerning these aspects of Ghanaian women especially at the community level. According to the Ministry of Food and Agriculture [54], Ghana's Medium Term Agricultural Development Strategy (MTADS), and the Vision 2020 Development Plan, strategies exist to: 1) bring services physically closer to women in the fishing communities; 2) involve women in the formation and management of programmes affecting them; 3) make women (individually or as a group) the contact point of delivering services directly to the beneficiaries, and also receive feedback on the programmes (e.g. distribution of benefits). Gender balance, according to the Fisheries Commission, is one of the main national development concerns that guide the National Fisheries and Aquaculture Policy [42]. However, analysis from the policy reveal that albeit it recognizes fish preservation and processing, it does not look into the roles or needs of women, nor does it make mention of the outcome of the policy actions on women [42]. Again, the Fisheries Policy (ACT 625) and the Fisheries and Aquaculture Sector Development Plan 2011–2016 dwells mostly on capture fisheries and typically male roles [42]. In general, the policy seeks to promote value addition in the fisheries sector in addition to improving livelihoods in fishing communities but stresses more on diversifying the fish species caught by fishermen than the formation of value chain improvements for women in fish processing and trade [42]. This paper is therefore based on the premise that women's roles and contributions to the fishing industry in Ghana are under-recognized and poorly documented as well as unacknowledged in management discussions. Though many publications on women in fisheries in coastal areas are available on a global scale, still little information pertaining to women fisheries in Ghanaian coastal communities exist. As such the non-inclusion of the needs and interests of women in fisheries could lead to policies and interventions missing their target of creating sustainable livelihoods based on marine resources. The objective of this publication therefore is to fill an important gap in fisheries management information, critical for decision-making processes geared towards more sustainable ocean-based livelihoods. The study focused on two fishing communities in the western coastline of Ghana. The primary objective of this paper is to analyse the role of women in fisheries livelihood within the context of their scale of operations and fish distribution networks. The study further assesses the constraints that impede their development within the fisheries sector, analysing their dependency on fisheries resources as a livelihood. Finally, interventions proposed by women for the improvement of their livelihood are discussed.

2. Methodological approach

2.1. Study area

A comparative study was conducted in two major fishing communities in the Western Region of Ghana. Namely, Dixcove ($4^{\circ}48' N, 1^{\circ}57' W$) in the Ahanta West District and Aboadze ($4^{\circ}58' 0'' N, 1^{\circ}37' 0'' W$) in the Shama District. These coastal districts were selected because of their fame in fisheries activities. Although these communities are relatively homogenous in most of their socio-cultural characteristics (most people speak Akan, particularly the Fante dialect, communities are rich in natural resources and communities also often host migrants). Dixcove is well-known for its tuna fisheries and the artisanal fisheries of Aboadze focuses mainly on sardinella, and thus both are crucial

environments for women’s activities.

Fig. 1 indicates the two study areas within the Western Region of Ghana.

2.2. Data collection

The study employed a mixed-method approach of both quantitative and qualitative methods of data collection to obtain a complete and



Fig. 1. Map of Ghana showing the Western Region including the study sites. Star symbol indicates landing sites where sampling was conducted.

comprehensive picture of women’s role as well as to enable effective triangulation of results. A combination of systematic household surveys, key informants’ interviews, focus group and participant observation were the main approaches used. Interviews were done face to face mainly at either the homes or in the smoking sheds of the women, while performing their processing or household roles. Field research was conducted from November 2014 to March 2015, and 200 women were randomly selected (95 and 105 in Dixcove and Aboadze respectively). Interviews were also held with key informants (see appendix). Furthermore, focus group discussions were held in both study communities (see appendix). The observed women fisheries activities included those of smoking, frying, salting or selling fresh fish not only for direct household consumption but also for sale on the market. Regular participation in respondents’ fish processing tasks in the studied communities helped with familiarization with community members and trust building. Careful observations were conducted to collect different qualitative information provided by the women engaged in their respective activities. Community walks were done (with a local fisheries official) to become familiar with the study sites and housing settlements. Acknowledgment of local customs and culture, together with a minimization of disrupting people’s routines, were also taken into consideration to ensure accurate information from respondents and gain in-depth knowledge about the dynamic roles of the women in the communities. Secondary data were obtained from various reports at the district assemblies. Responses from the questionnaires were categorized, grouped and coded for analysis using - the Statistical Package for Social Science Software (SPSS, version 16) (see appendix). Qualitative information was used to triangulate with the quantitative information.

3. Results and discussion

3.1. Role of women in fisheries livelihoods relative to scale of operations and networks

Women are un-passable actors in the distribution and the sales of fish - the fish processors in western Ghana’s coastal fishing communities are

no exception. The relationship between men and women in fisheries is mutual. Fishers get financial credits from the women to buy fuel, ice, food and repair the nets (among other things) for their fishing trips. The women in turn get the fish brought by the men, which keeps them in business. The men, being fatigued on their return from fishing trips and also unskilled in fish processing activities, require the help of the women to take charge after the catch has been landed. Failure to process and sell the catch will mean a blow for the entire household. As such, women have the vital role to turn the fish into monetary value (fish to cash). Consequently, women are a key source of family wealth in the coastal fishing communities in Ghana (Britwum, 1999 [38,43]; Bortei-Doku, 1991; Vercrujisse, 1983). The roles of women in fish marketing are thus central, as they are often the main distributors of fish (see Fig. 2). Fish therefore gets to the markets mainly through two groups of women, the ‘fish wives’ and the ‘fish mummies’ [35,44] who are also the fish processors. Their level of operation and the power they possess is what differentiates these two groups. The fish wife could be described as a fish retailer since she deals on a smaller scale level, while the fish mummy is a large-scale fish processor and trader [40]. A fish wife could either be the wife or a female relative of the fisherman to whom he delivers his share of fish [35]. These two groups of women serve as the link between the fishermen and the consumers.

3.2. Power dynamics between and within men and women and community level social relations

In fishing communities in Ghana, fish is a highly valued resource as it provides employment to both men and women in the community thereby providing wealth to the community [37]; however, one’s entrepreneurial skills is very imperative in this industry. Owing to this, fishermen and women differ in their economic status and as a result two key groups is being observed, as acknowledged in the works of Overå [35]; Odotei [44] and Osafo-Gyimah and Afful [55] on the artisanal marine fisheries in Ghana.

A woman’s socio-economic power is enhanced once she owns her own fish processing equipment and pre-finances a fisherman’s fishing

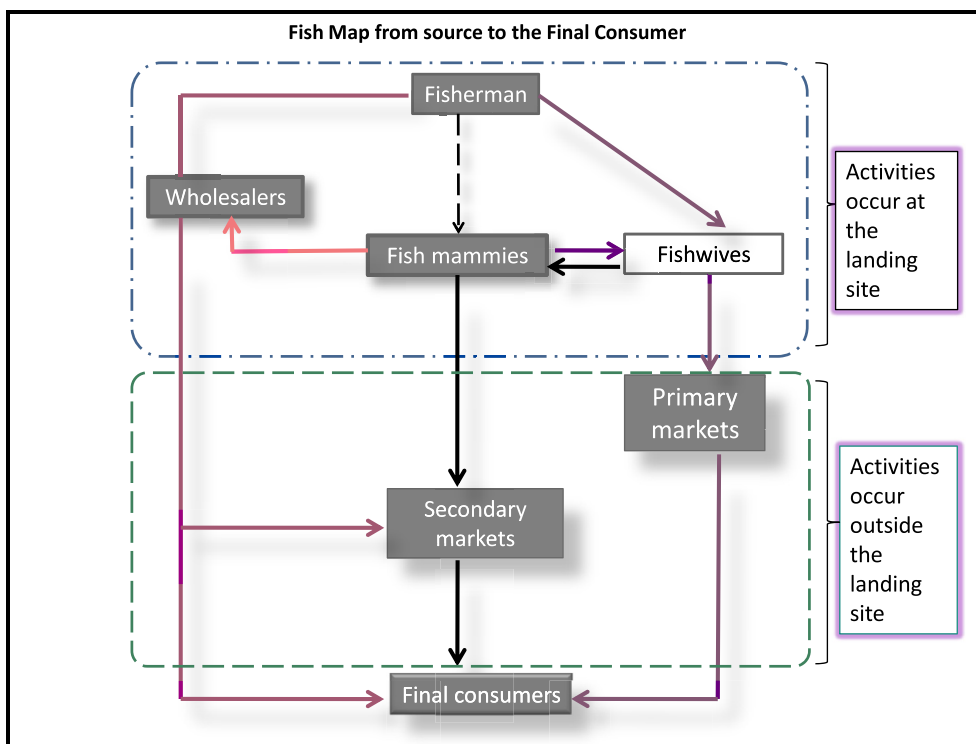


Fig. 2. Fish map from source to the final consumer.

trip. This she does either by utilizing her saved-up money or by accessing credit. With time backed by entrepreneurial skills, she could grow her capital to increase the number of fishermen for whom she sponsors their trips. Thereby she accessing more fish and becoming an established fish processor (fish mammy) to employ or hire the services of other women (fish wives) [42]. Likewise, as confirmed by Osafo-Gyimah and Afful [55], fishermen are also in two groups; 1) the capitalist fisherman who owns major fishing equipment such as a canoe, outboard motor and fishing net and hires labour (working fisherman) and 2) the working fisherman who owns no fishing equipment but derives income from his labor in catching fish. However, the capitalist fishermen who goes to sea earn extra income from their own labor as well [43]. More so, similar to Lake Victoria in Kenya [45], there are a few women in Ghana who own canoes and other fishing inputs (as the case in Dixcove). These women exert power over the working fishermen and as they have direct access to fresh fish, however, this accomplishment is constrained by their inability to go to sea [37]. As such, often leads to some power and control issues between the male captains and these female canoe owners. Odotei's studies on women canoe owners revealed that such women face the risk of having male captains, who supervise the crew on their canoes, taking over their canoes completely from them and thus mostly result to solving this situation by using their relatives and sons as captains (Odotei, 2000: 6). One important woman amidst the women involved in fisheries is the chief fishmonger (konkohene), who is chosen by the community to head the women. She is a woman who has distinguished herself in fish processing, is experienced in fish trade, and understands complex affairs relating to women in the industry. The konkohene determines the price of the fish the men have landed on behalf of the women. Depending on the market dynamics, the fish's price may change from week to week. She also plays the role of a mediator for the fish processors and settles disputes among them. However, in recent times, due to the industrialization of the fishing industry predominantly the introduction of the outboard motor, there is a raise in the cost of fishing equipment and canoes and fishing nets had to

be bigger [38], making fishing an expensive venture. As such more individuals have more bargaining rights than the Konkohene. The fishers and some fish processors (for instance canoe owners' wives) increasingly seem to disapprove of the Konkohene because they argue they do not provide financial assistance for fuel for fishing trips nor provide funds for damaged gears or canoe, thereby limiting the traditional power of the Konkohene to arbitrations mostly in debt defaulters. As such, her fish negotiation roles seem to be fading out.

Key informants revealed that some of the fisherfolks had formed associations within the communities, but these groups were largely social welfare groups that provided support during bereavement or during any social welfare-related function.

Also, information from key informant interviews and focus group discussions helped provided the map of fish distribution from coastal source to the final consumer and the social networks that are involved. The 'Fish Map' from the source of the fish to the final consumer and the extent of fish distribution has been depicted in Figs. 2 and 3 respectively.

3.3. 'Fish mummies' and 'Fish wives': scale of operations, power and networks

When the fishermen arrive from their fishing trip, the fish can be sold directly to either fish mummies or fish wives at the landing sites. Fig. 2 allows to understand at a glance what vital functions would have to be taken up by the fishermen themselves, if it was not for the fish mummies and wives. Fish wives operate on a small-scale level and hence sell the fish either fresh or in a processed state at the primary markets. These are markets within the community or district where the final consumer can directly buy food items. Fish mummies on the other hand, can either process the fish themselves or employ the services of others (fish wives) to do the processing for them, and they in turn sell it at the secondary markets outside the district or region. If the fish mammy is old and retired, a female relative like her sister or her daughter takes over the sales of the fish at these distant markets. She could stay up to about three

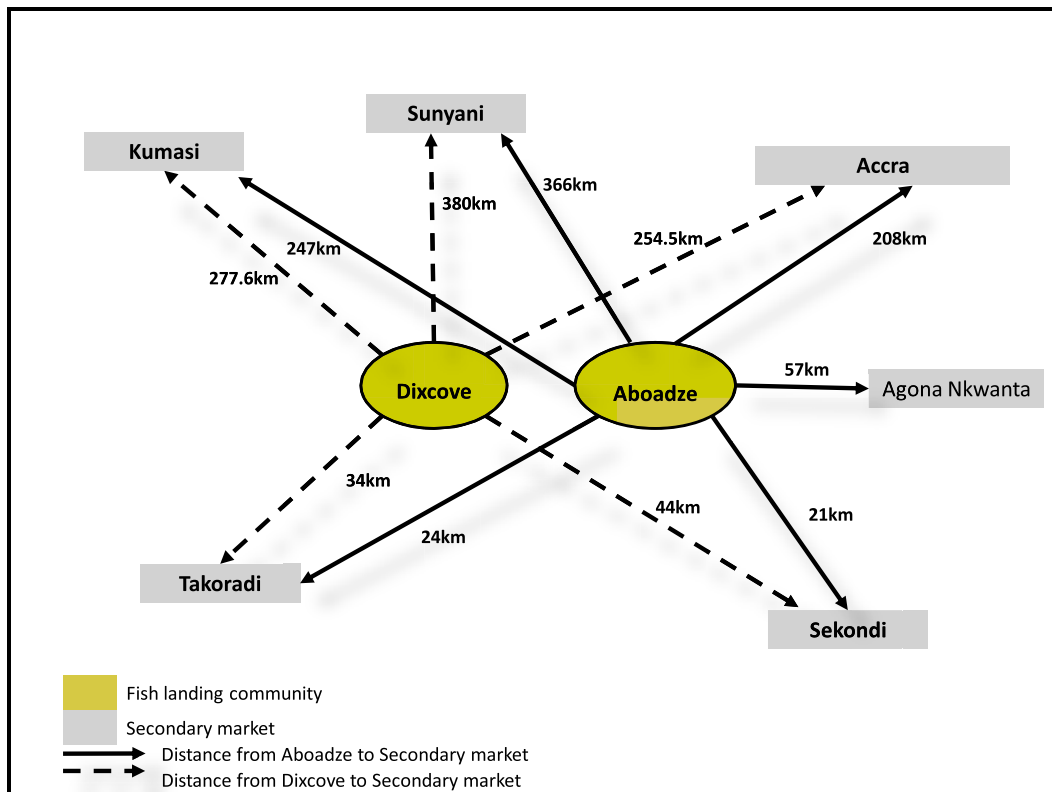


Fig. 3. Fish markets and distances from the coastal study sites.

to five days depending on the number of baskets of fish or how well the market does at the market centers. Fish mammies could also sell fish to wholesalers who buy fish in bulk in the fresh state, and also in turn retail to hoteliers and other local eatery operators locally referred to as “chop bars”. Fish mammies are generally regarded as rich women by local standards as they have their own processing equipment such as fish trays, pans, smoking sheds as well as finance fishing trips of fishermen. Fish mammies or fish wives often sponsor the fishermen’s fishing operations for instance by providing funds for the fishing trips: traditionally, women provide money for fuel as they are the ones who turn fish into its monetary value [37]. Fig. 3 shows examples of some of the common secondary markets of fish mammies together with their distances from the landing sites - Abobloshie market in Accra, Asafo and central markets in Kumasi, Suyani market, Agona Nkwanta, Takoradi and Sekondi Markets.

3.4. Household related complementary roles of women

This study additionally indicates that women engaged in an alternative livelihood to support the family, especially in the lean periods when fish catches are low. Most of the women (38% and 78% in Dixcove and Aboadze respectively) were involved in Petty trading of items such as bars of soap, sachets of salt, sugar or agricultural products such as tomatoes, pepper, okra and many more. Some of the women also engaged in farming activities (29% and 5% in Dixcove and Aboadze respectively), while others also engage in other alternatives such as bakery, tailoring and hairdressing (Fig. 4). The complementary roles performed by women can be categorized into two main two key groups (Fig. 5). Focus group discussions in Aboadze indicated that most fishermen’s wives support and finance their men’s fishing trips by taking informal loans from savings groups. Some women asserted that a large portion of the proceeds from fish sales is reinvested into fisheries. In addition, during the lean seasons when catches are low, women engage in activities outside of the fishery to supplement the money made in the fishery due to the seasonality of the fishing business. Thus, confirming the statement of Overå [35]; women supplement the fish business with the sale of cooked food or agricultural produce. As such, the extra effort expended by women to keep their men in the fishing activity and the families fed, is critical, as they cover part of the basic household needs of the family, including food and children needs.

3.5. Dependency level of women in fishing communities on the fishery resources

Results from study revealed that a vast majority of women

respondents from both study sites, mentioned fish processing and trade as the main source of livelihood (98% and 96% in Dixcove and Aboadze respectively). Even though Fig. 4 highlights the existence of alternative means of livelihood (such as petty trading) women’s dependency on fish was found to be almost total and thus any change that occurs in the fisheries directly may substantially affect their livelihood. For instance, it was observed in Aboadze that fish carriers are paid with fish after their service. More so, for years, neighboring villages surrounding Aboadze who are mainly farmers, bring foodstuff like cassava, plantain, palm nuts and other produce to barter trade them for fish twice a week (Tuesdays and Fridays), as an innovative approach to housekeeping. These women can be likened to the women at Katunguru village in Tanzania and other parts of the world who regard taking care of their family members food needs a prime responsibility [46]: 104).

3.6. Modes of access to fish by women

Unlike the mama karanga of Kenya (women involved in fish frying in Lake Victoria of Kenya) where the fishery sector is comprised mostly of single, divorced, and widowed women [41], marriage was found to be very important among women in the studied fishing communities (86.1% and 74.4% in Dixcove and Aboadze respectively). As it was one assured way of accessing fish since women’s inability to go to sea to do actual fishing limits their access to fish. A woman’s access to fresh fish depends on kinship ties and the most dependable is marriage and is sustained by entrepreneurial skills [37]. This study thus confirms Matthews et al. [25] and Thorpe et al. [20] works on women being marginalized in access to and control over fisheries in many countries. Traditionally, in Ghana, a fisherman gives or sells his catch to his wife or wives if he has multiple wives, which is sometimes the case in the fishing community (having more than one woman is a sign of wealth). Fishermen who are not married give their catches to their mothers and sisters. By custom, fishermen do not give their wives housekeeping money as they believe that women make enough profits from fish sales and as such should use the profits generated from the fish sales to keep the family going. Thereby confirming Odotei’s (1992) conclusion that fishermen do not routinely give their wives monies for housekeeping but give them either capital to trade with or fish from their expeditions. Hence things become tough for the women if the fishermen do not go to sea or bring little catch. Thus, these periods are especially harsh on the women’s coping capacities, when they have to pay their husbands for the fish, pay for their fishing trips and pay for the household. This is a very tight financial scheme. Typically, a fisherman gives or sells his catch to his wife or wives, however, if another woman finances the fishing trips (as is the case for fish mammies), he would be obligated to sell the fish to that

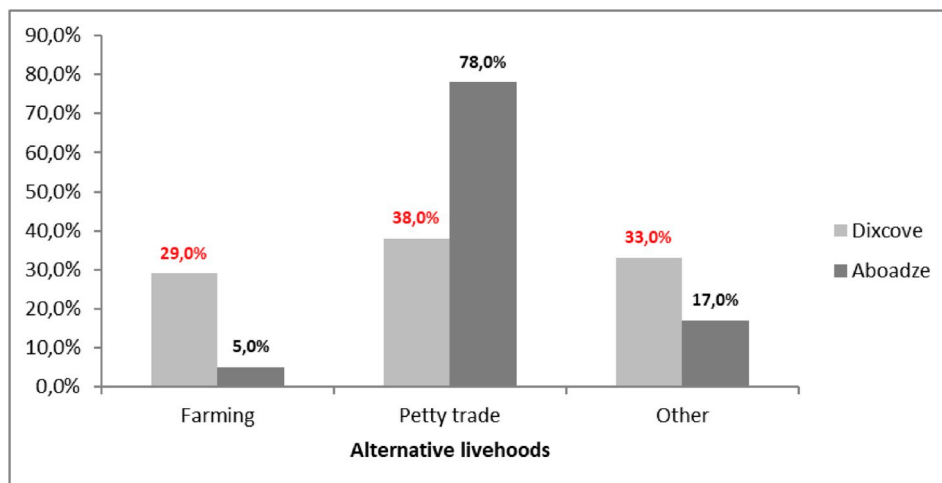


Fig. 4. Alternative livelihoods engaged by women.

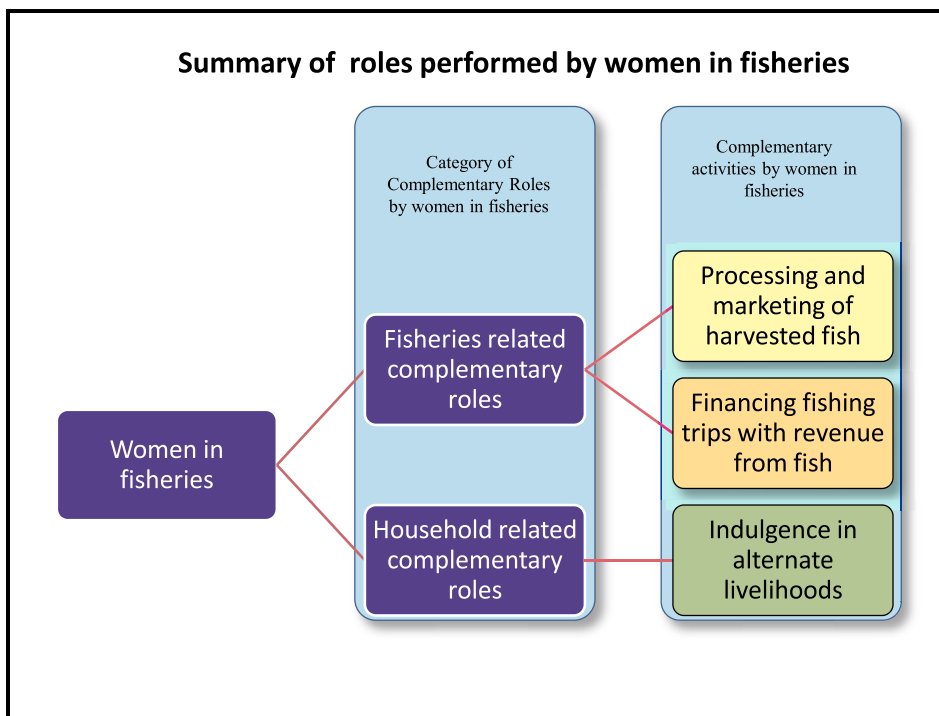


Fig. 5. Complementary roles performed by women.

woman instead. For this reason, most wives invest in their husband’s fishing operations to protect their position as the main buyer or distributor of his fish. She provides funds to pay for fuel or ice blocks or food for the fishing trips. This strengthens men’s position in the economic relationship with their wives [37]. Generally, husbands and wives are economically dependent on each other, and the mutual benefit relationship makes marriage important for the ability for both men and women to make an income out of fishing (Overa, 1993).

4. Constraints that impede fisheries from being a sustainable livelihood for women

The study showed that women in fisheries residing in the Western

Region of Ghana face certain challenges which hinder the progress and development of their activities. Fig. 6 shows these problems as indicated by the women in Dixcove and Aboadze. A total of ten (10) major constraints were identified. The majority of the respondents in both study sites mentioned health issues as the prominent difficulty. Health issues centered around lung problems and irritations to the eyes due to constant inhalation of smoke and exposure to heat during the fish processing activities (Figs. 6 and 7). Fish preservation is done through processing as they add value to the fresh fish - preservation (largely smoking) is done to ensure fish availability long after the peak season as well as allowing it to reach consumers who are far from the landing beach. Fish smoking is done on ovens built from clay, and firewoods are burned to keep the ovens hot while the fish are laid on open fish trays

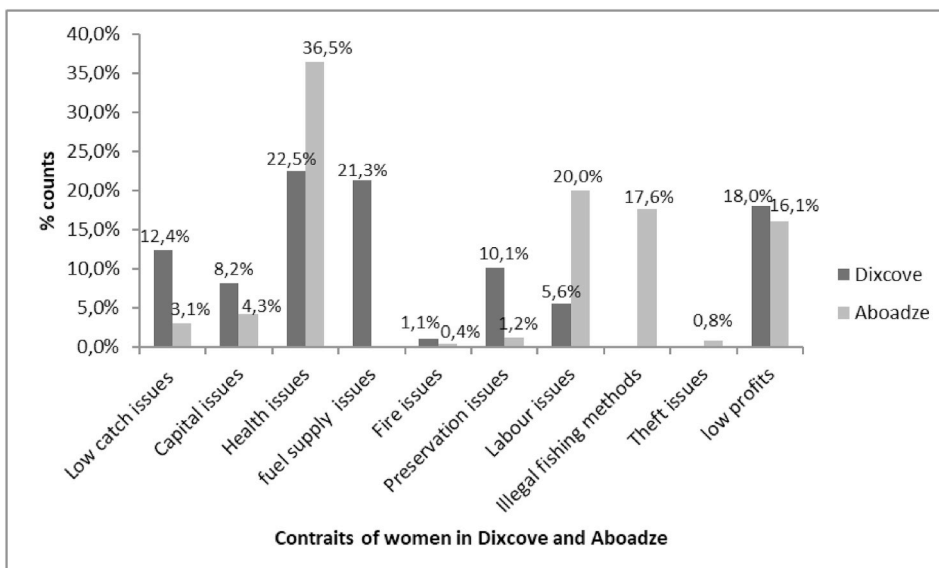


Fig. 6. Constraints and challenges faced by women in coastal fisheries in Ghana.

above the fire. This process results in smoke emission, which the fish processors are directly exposed to. Women also indicated low profit as another constraint that affected their livelihood to a great extent in both study sites. Low catch issues, access to capital issues, proper preservation of fish and the laborious and time-intensive nature of their work (in addition to the travel times to secondary markets) were other constraints that also affected women in both study sites. Most of these constraints are similarly experienced by women in other parts of Africa as well [47, 48]. For instance, the mama karanga in Kenya stated financial constraints as one of the barriers impeding their activities [49,50]. Low fish catch according to respondents was attributed to the use of unsustainable fishing methods. More so, one challenge that fish processors and traders face in general is limited access to loans from the traditional banking system to expand their business as most often they do not have collateral for accessing formal loans and as such rely on informal loans often from savings groups. As found by Fröcklin et al.'s [11] study on fish traders in Tanzania, start-up capital was usually sourced from micro-credit, savings, or money is borrowed from friends or relatives. However, constraints such as the indulgence in destructive fishing methods like chemical fishing were mentioned in Aboadze. Destructive fishing methods such as light fishing and fishing with chemicals are affecting processed fish preservation longevity and marketing activities. According to respondents, governance institutions for fisheries management is weak. They reported that they have asked the government through their chief fishermen and traditional leaders on many occasions to ban these destructive methods but to no avail; and according to them, weakness on the part of the enforcement units was the cause of the persistence of these unsustainable fishing activities. "The government must gather the needed political will to ensure that those who violate this law are brought to book. If people are arrested, prosecuted, and jailed for using these bad methods to fish, it will serve as a deterrent to others" (respondent from Aboadze). This, according to them, was because not only was the practice harmful health-wise, it also reduces the value of the fish in terms of its freshness, firmness and taste. Using chemicals such as washing detergents, carbide and DDT together with bright lights as the attractive device, cause fish hemorrhage, damaging the flesh and reducing the time they can be preserved through smoking from months to days. This affects the women's businesses substantially as the smoked fish often spoils before being sold, and hence cannot be stored for the lean months when fish prices are higher for them to gain profits. This has resulted often in huge losses and low profits for the women. A larger study including the secondary markets in the regions, e. g. an in-depth participant observation of several marketing trips of fish wives and fish mummies, could provide much valuable additional information.

5. Proposed government interventions by women for the improvement of their livelihood

When women were asked about what the government could do to improve their livelihood as far as their fisheries activities were concerned, the majority of the women in both study sites mentioned access to capital as the number one requisite need (Fig. 8). Capital is what they need to invest in their businesses as their work demands that they always have money to buy fish as well as the logistics for fish processing activities. Indubitable, one's access to fisheries inputs, credit and other financial support within the small-scale fisheries sector is crucial for one's ability to survive in the industry [51]. Following up from this, information from both focus group discussions and key informant interviews revealed that the main need in Dixcove was an ice and cold storage facility to reduce post-harvest losses and to allow for the storage of fish to be processed during the lean season. Post-harvest losses are prevalent especially when there is a bumper catch in the peak seasons. So far, women have adapted to the delay of their request from the government by using old refrigerators and freezers for fish preservation. However, these efforts were frequently made futile due to the country's frequent power cuts. In Aboadze, following also from Fig. 8, the prominent request of the women was found to be the ban on destructive fishing methods - chemical fishing was perceived to be causing immense damage to the livelihood of women (see above). Fish caught with these methods deteriorates in an observable time-window and can thus not be preserved nor transported, with catastrophic results for marketing and the fisheries-related livelihoods.

6. Policy needs and recommendations

It is obvious that women's role is crucial for the fishery, family as well as for the community. As such, Ghana's government and all the relevant authorities need to strictly enforce the ban on destructive fishing methods especially light fishing coupled with fishing with chemicals as it is affecting women's livelihood substantially. More so, storage facilities are a prominent need of women as post-harvest losses are prevalent especially during a bumper catch. Women are therefore petitioning the ruling authorities to provide them with cold storage facilities to curb the situation. Furthermore, the government (through the Ministry of Fisheries and Aquaculture Development as well as the Ministry of Gender, Children and Social Protection) could consider training women in modern and safe ways of fish processing in order to reduce associated health problems. Additionally, government could also link up and engage with non-governmental organizations, development partners, training institutions or any organization interested in women



Fig. 7. Fish processors smoking fish.

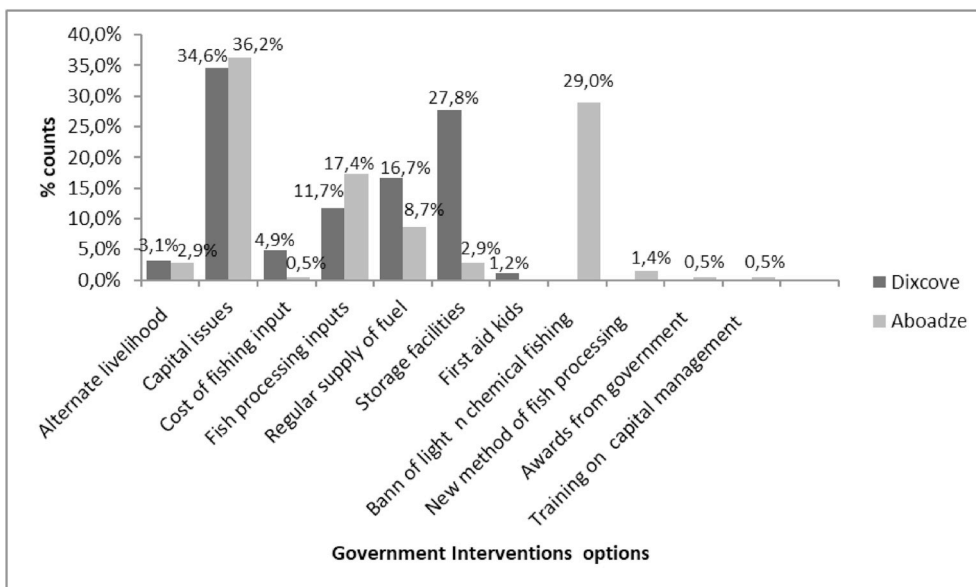


Fig. 8. Government interventions to improve the women’s fisheries dependent livelihood.

development to ascertain financial and technological support for women in fish processing and trade. Since women’s success in fisheries is boosted by entrepreneurial skills, they need to be empowered by accessing training on business management and record keeping. These trainings could maximize their profit levels and alleviate poverty. Training could also include post-harvest handlings (fresh and processed fish) as well on general hygiene. Women should also be encouraged to form groups and trustworthy leaders should be appointed to foster good management in order to promote their needs and interests and already existing women’s groups should be revamped and fortified. Access to savings and micro-credits can become easier as bankers prefer to give loans to groups rather than individuals thereby improving their social and economic status. Also, the powers of the women leaders in fisheries at the community level should be well recognized and reinforced to make their work more efficient, for instance that of the Chief fishmonger (Konkohene). Last but not least, government could also engage with women in fisheries to improve enforcement of fisheries regulations such as ban on destructive fishing methods - as women could team-up in groups and refuse to buy illicitly caught fish; which however will clearly not be an easy task or a single step to take but definitely one to be encouraged. For logistics reasons, this study only covered the primary markets, hence further studies into the extent of these networks could be expected to bring much valuable insights.

In conclusion, as study reveals, women in Ghanaian fisheries like in other parts of the world, play crucial economic roles in both the fishery sector as well as in the upkeep of their families. As such, their roles and needs within the scale of operations and fish distribution networks should be better integrated in interventions and in policy-development processes, as the fishery resource and the survival of the industry partly depends on their roles.

Declaration of interest

The authors declare that they have no conflict of interest.

Author statement

All authors have seen and approved of the manuscript submitted as the corresponding author sent all co-authors a copy of the final revised manuscript.

All authors agree with the contents of the manuscript and its submission to the journal. Each author has participated aptly in the work, in its conception or design, data analysis or interpretation and in drafting or revision of the manuscript. Thus, each author takes responsibility for the validity, integrity and objectivity of the entire sturdy.

This manuscript is an original work and no portions of this manuscript is being considered for publication elsewhere in any form while being considered for publication in this journal. Any research in the paper not carried out by the authors is fully acknowledged in the manuscript.

CRedit authorship contribution statement

Anita B. Ameyaw: Conceptualization, Data curation, Methodology, Formal analysis, Funding acquisition, Investigation, Resources, Software, Visualization, Writing - original draft. **Annette Breckwoldt:** Conceptualization, Formal analysis, Project administration, Resources, Supervision, Validation, Writing - review & editing. **Hauke Reuter:** Conceptualization, Formal analysis, Project administration, Resources, Supervision, Validation, Writing - review & editing. **Denis W. Aheto:** Conceptualization, Methodology, Formal analysis, Funding acquisition, Project administration, Resources, Supervision, Validation, Writing - review & editing.

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Annex 1. Study Sites and Groups Interviewed

Study sites	Focus group	Key-informant interviewed
Dixcove Aboadze	<ul style="list-style-type: none"> ●Fish processors and Fish traders ●Fish Traders and Fish processors 	<ul style="list-style-type: none"> ●Fisheries Technical officer (Dixcove) ●Chief-fisherman (Upper and lower Dixcove) ●Head of women group (Aboadze) Secretary to chief fishmonger (Aboadze) ●Assemblyman (Dixcove) ●Chief-fisherman (Aboadze) ●Canoe owners wives (Dixcove) ●Chief-fishmonger (Dixcove) ●Chief-fishmonger (Aboadze) ●Female canoe owners (Dixcove) ●Retired fish processors (Dixcove and Aboadze)

Annex 2. Focus Group and Key Informant Interview Questions

What is the general engagement of fishery roles in this community?
 - Who does what exactly and why?
 Has there been any historical or cultural change in these roles?
 - Has it always been like this from the past?...e.g. how was it like 10 years ago
 Were women allowed to fish in the past?
 What are the important commercial species in this area and how valuable are these species in the markets?
 - -What are the types of fish preservation methods done?
 - -When and where are sales of fish done?
 - How does fishing seasons influence the prices of these commercial species on the market in relation to gains or losses?
 How easy is it for one to get access to initial capital and further expansion of business?
 Who controls the income from fisheries?
 How are families sustained especially during the lean season periods?
 What are the main challenges women face in this fishing industry and what do you think can be done to improve this economic activity as well as sustain this source of livelihood for the next generation?
 Has there ever been a functional women’s group in fisheries in this community? If yes, what are their roles and challenges?
 How efficient are the groups? What can be done to fortify the groups? How do you want it to be managed?

Annex 3. Questionnaire

Fishing community: Date:

1) Name of the respondent:
 2) Age:
 3) Marital status: 1) single 2) married 3) separated 4) widowed 5) divorced
 4) Ethnic group: 1) Ahanta 2) Nzema 3) Fante 4) Ewe 5) other
 5) What is the highest level of education completed?
 0) none 1) primary 2) junior high school 3) senior high school 4) above.
 6) What are the main roles of men in this community (in ranking order):
 1) Fishing 2) farming 3) net making 4) net mending 5) Boat building 6) other
 7) What are the main roles of women in this community (in ranking order):
 1) Childcare 2) home keeping 3) fish processing and trade 4) farming 5) other

8) Can you state additional activities that women are directly engaged with in this community?... ..

 9a) Do women in this community fish?
 1) yes 2) no.
 If no, then
 9b) What do you think is the reason why women are not actively involved in fishing ?
 1) It requires a lot of energy 2) Cultural norms and tradition prohibit women from fishing.
 3) High initial investment costs 4) Risky nature of fishing (rough weather, gear theft).
 5) Women have too much domestic work 6)Fishing involves being out of the homes for too long 7)It is a job only for men.
 10) Why do you think men are actively involved in fishing ?
 1) Better access to loans from factories and individuals 2) Men are stronger and can better tolerate bad weather 3) Men have more fishing experience than women, know various strategies 4) Culturally and traditionally, it is the work men do 5) Men are able to leave their families for long periods of time 6) Men go after financially more lucrative deals than women (such as fishing).
 11) Where do you sell your processed fish and why 1) landing site 2) nearest market 3) outside the district 4) other
 Reason
 12a) How far is the distance from the landing site and the market place?
 1) 1–10 m 2) 10–100 m 3) more than 100 m.
 12b) What is your means of transport from the landing site to the market place..?
 1) walking 2) by own cars 3) by public transport 4) other ...
 13) Which fish state do you prefer to sell your fish in and why?
 1) Fresh 2) smoked 3) salted 4) fried 5) other.

Reason

14) What is your working pattern like? 1) individually 2) with family member 3) with other women 4) other

15) What do you do during the low season?

1) Farming 2) petty trade 3) migrate 4) nothing 5) other ...

16) What type of income source is this economic activity for you ?

1) main 2) subsidiary.

17) What are the most important commercial fish species in this area?

18) How did you come to do this work?

1) Trained by parents and family members 2) motivated by friends 3) only source of income 4) other Specify

19) Do you know people who have abandoned this business? 1) Yes 2) no 3) I don't know

If yes What do you think is the reason

1) low catches 2) low income 3) is too tiresome 4) large capital needed 5) ventured into other businesses 6) no markets for products.

20) Who owns the money after the sales of this fish?

21) Do you have the ability to spend money according to your own will?

22) Do you have access to loans or microcredit to expand your business

1) yes 2) no.

If yes, from where.

1) Bank 2) NGO 3) groups (cooperatives) 4) relatives 5) other

23) Do you have special group/association for the fishery? Are these groups functional or useful? 1) yes 2) no

If yes, in what ways?

24) Do you face any problems in this economic activity?

1) Yes 2) no.

If yes please name them.

25) What do you think the government can do to better your livelihood as well as sustain this livelihood for the next generation?

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