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RESEARCH ARTICLE

Analysis of fishers' wellbeing in the western region of Ghana

Edward Ebo Onumah, Ramatu Mahama Al-Hassan, Joseph Ocran, and Christophe Béné

ABSTRACT

Small-scale fisheries in Ghana are declining in response to the global fisheries crisis. The policies to curb this situation are dependent on the wellbeing of fishers in terms of material condition, quality of life, and transformative strategies for sustainable livelihoods. This paper employs survey data to investigate the wellbeing of fishers, using descriptives, principal-component analysis, and structural equation modelling. The results revealed that the summative effect of material condition, quality of life, and sustainability on fishers' wellbeing is low. Despite the low ranking of income (lower among men fishers than women fish processors), basic necessities, and government support, fishers are still motivated to work but claim that their children may one day be locked out of the industry. This paper addresses the gap in the literature by establishing the need to enhance educational facilities for the children of fishers, while complementing with investments that create job opportunities in the fishing communities. This may eventually reduce dependence on the sea for sustainable fisheries.

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Marine fishers; small scale; wellbeing; Ghana

Introduction

The fisheries industry plays a significant role in the socio-economic development of many countries. In Ghana, the fisheries sector contributes 3 per cent of the nation's gross domestic product (GDP) and about 5 per cent of the agriculture GDP. Ghanaians derive over 60 per cent of their total animal protein from fish, which supplies vital and unique nutritional value, including vitamins, minerals, and micronutrients (Asiedu, Failler, and Beygens 2018). Despite these benefits, the world fisheries have been declared as being in a state of "global crisis" due to over dependence on fish stock, which has resulted in stagnation or decline of global captured fisheries. Ghana, for instance, is currently facing one of the worst over-fishing situations in Africa, with small-scale fishers (men fishers and women fish processors) reporting decline in fish landings (Danquah, Roberts, and Appiah 2021).

In response to this global crisis, many experts have called for fishery reforms to significantly curb fishing efforts for the sustainability of the world fisheries (Béné et al. 2016). However, ensuring the political and social feasibility of such reforms when so many poor households depend on fishery resources for their livelihood is significant. In this context, it is not surprising that a strong resistance to the proposed reforms has emerged within fishery-dependent communities and amongst policy-makers at local, national, and international levels (Free et al. 2020). It is therefore important to complement the reduction of overall fishing effort with reforms in ways that do not further increase poverty among the fishers. Thus, undertaking a comprehensive analysis to explain why the fishers are still in business even when they are facing a persistent declining catch is paramount. In view of this, analysing the fishers' wellbeing, whilst focusing on their happiness, rather than only

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the income from their activities, is paramount. Issues of wellbeing and fisheries to generate recommendations for policy consideration have seldom been researched in Ghana.

Weeratunge et al. (2014) focused on a three-dimensional approach of assessing wellbeing in terms of material, relational, and subjective factors. Building on this conceptualisation and consistent with the OECD (2011), this study considers wellbeing to encompass material condition, quality of life, and sustainability. Following Hiola and Hiola (2015), the current paper adopts the structural equation model (SEM) to assess the effects of these three constructs on the wellbeing of fishers amidst the declining fishery stock in the western region of Ghana. The SEM permits the analysis of simultaneous relationships between the endogenous latent variable (wellbeing) and the exogenous variables (material condition, quality of life, and sustainability).

Literature review

Ruggeri et al. (2020) have described wellbeing as a state in which individuals' and society's needs are met to enable them to enjoy a quality of life that is achievable and satisfactory. Whilst Chappell and Meissner (2022) have concentrated on the three main theories of wellbeing – hedonism, desire theories, and objective list theories – this study reflects more on the elements and interventions theory of wellbeing that focuses on positive emotion, engagement, relationships, meaning, and accomplishment, and the centeredness theory that emphasises wellbeing across the life domains of self, family unit, community, relationships, and work.

Governments and researchers have made attempts to understand and measure wellbeing for policy formulation. Earlier studies considered material gains as wellbeing, which was measured using the national income (Allin and Hand 2017). Coulthard et al. (2014) argued against using a single economic measure of wellbeing, such as gross domestic product (GDP), and proposed a more holistic approach to include other dimensions, such as natural resource management and environmental sustainability. Ruggeri et al. (2020) also noted that the use of a single matrix as a measure of a multidimensional wellbeing is not appropriate. According to Gillam and Charles (2018), wellbeing is currently measured under multiple key dimensions: material (income, wealth, assets, physical health, or ecosystem services), relational (social interaction, collective actions, and social support), and subjective wellbeing (cultural values, norms, belief systems, shared hopes, fears, and aspirations). Camfield et al. (2013) and Opoku, Oti-Boateng, and Amoako (2021) also focused on material wellbeing and subjective wellbeing, and included the aspirations of the respondents in a sustainable dimension. Other research has analysed the effects of some socioeconomic factors on wellbeing. For example, Javed et al. (2016) revealed that formal education contributes knowledge, cultural values, and life skills that are considered important in one's life. Campos et al. (2014) demonstrated that aging adult men and women with more years of education and good self-appraised health reported better quality of life. In a study to examine the household-level wellbeing in northern Ghana, Zereyesus et al. (2016) showed that the literacy level of the father and the number of dependents is linked with the improved physical wellbeing of households.

The study of wellbeing and fisheries has a long-shared connection in the literature and takes a closer look at both material and non-material needs. Anna et al. (2019) studied the subjective wellbeing of fishers in Indonesia and found that fishers did not have lower subjective wellbeing compared to non-fishers. Gillam and Charles (2018) used material, relational, and subjective wellbeing to assess the effect of environment and its cumulative impact on the wellbeing of fishers in an urban coastal community of Brazil.

Kpanou et al. (2021) revealed that education, asset ownership, occupational skills, and increased fish stock have a positive impact on the wellbeing of fishers. Satumanatpan and Pollnac (2017) also found that extended years of formal education enhances the wellbeing of fishers. Kpanou et al. (2021) noted a direct association of fishers' wellbeing with the earnings from fishing and noted that fishers find satisfaction in their occupation when there is enough fish catch. Sultana et al.

(2021) and Lowe et al. (2019) demonstrated that better understanding of government policies such as fishing bans and light fishing, whilst accounting for religious activities, could be effective for sustainable fisheries management to enhance the wellbeing of fisherfolks. Pita et al. (2022) were also of the view that recreational activities through social gathering can promote the exchange of ideas on skills development to enhance the psychological and economic wellbeing of fishers.

There have been varied findings on the wellbeing of fishers along gender lines in the literature. Torell et al. (2019) speculated that men fishers have a higher economic wellbeing than their women counterparts. This is attributed to the fact that women invest efforts in household chores with less work in fish landing for remunerative gains, which affect their wellbeing. Szaboova, Gustavsson, and Turner (2022) found that, apart from the major contribution to the economic development of fish trade, women assist in maintaining the strong physical and psychological wellbeing of fishing households, usually at the expense of their own material, social, and emotional wellbeing. This was buttressed by Adaawen and Owusu (2013), who noted that women have strong bonds to their families. Contrary to these assertions, Danquah, Roberts, and Appiah (2021) revealed that women fishers have better economic wellbeing due to the value addition in the fish chain (cleaning, smoking, salting, and frying of fish) for higher profit than men fishers, who primarily sell the landed fresh fish.

Though some investigations (Freduah, Fidelman, and Smith 2017; Torell et al. 2019; Lowe et al. 2019) have been carried out in the developing countries, most fishers' wellbeing studies have been conducted on commercial fisheries in developed countries. An in-depth analysis therefore needs to be conducted on the wellbeing of small-scale fisheries in developing countries to identify gaps for policy interventions that can ensure the sustainability of the fisheries stock and improvement in the welfare of the fishers.

Methodology

Analytical procedure

In this study, wellbeing is as a latent variable, defined by perceptions of fishers about three constructs (material condition, quality of life, and sustainability). For all the indicators under each construct, two questions were asked about the respondents' perceptions of importance and their satisfaction with the contribution to the fishers' livelihoods. The questions on importance were ranked on a four-point scale (4 = very important, 3 = important, 2 = not too important, 1 = not important at all), whilst the questions on satisfaction were ranked on a five-point scale (5 = very satisfied, 4 = satisfied, 3 = neither satisfied nor dissatisfied, 2 = dissatisfied, 1 = very dissatisfied). Descriptive analysis, in the form of bar graphs, is used to assess the relation between fishers' assessment of importance and satisfaction, whilst noting gender differentials.

To assess the influence of material condition, quality of life, and sustainability on fishers' wellbeing, this study employed the SEM to establish the relationships that explain the magnitude of the effect (direct or indirect) between independent (constructs) and dependent (latent) variables of wellbeing. However, prior to the SEM analysis, the principal component analysis (PCA), which has the advantage of reducing the dimensionality in data without losing relevant information, was performed with data validity, reliability, and consistency tests. The domain factors that were highly loaded under the PCA and were used for the SEM analysis are presented in Table 2.

The SEM takes into consideration both direct and indirect causal relations between constructs, indicating that one causal relation may be supported or counteracted by another. Consistent with Hiola and Hiola (2015), the SEM in this paper is operationalised with an illustration in Figure 1 and hypothesises that material condition, quality of life, and sustainability and their interactive linkages ($H_1 - H_6$) do not influence household wellbeing, whilst noting socioeconomic characteristics as control factors.

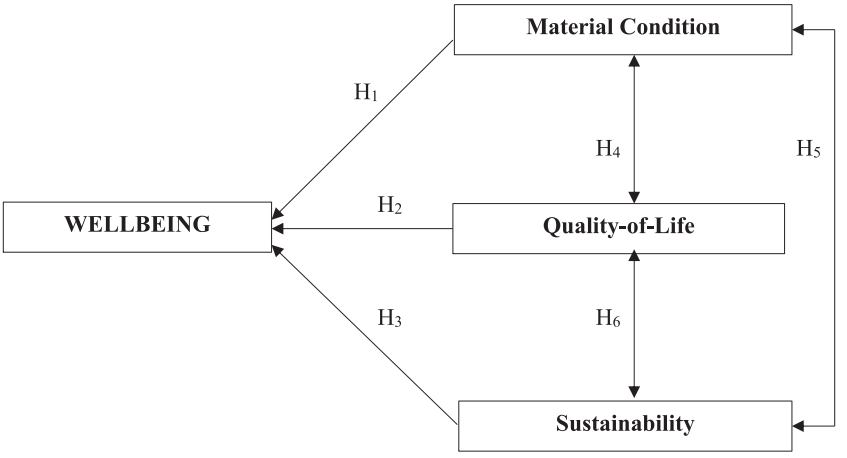

Figure 1. The SEM framework for the study. Source: Adapted from Hiola and Hiola (2015).

Study area and data collection

The study, which targeted men fishers and women fish processors, was conducted in the western region of Ghana, where two project communities (Abuesi in the Shama district and Ngyiresia in the Sekondi-Takoradi metropolis) were identified (Figure 2). The rising cost of living, emerging opportunities and expectations from the oil industry, the existing opportunities to diversify into cocoa production, small-scale mining, and other services influenced our choice of the study area. The study conducted three focus group discussions (men, women, and mixed gender) in each community, involving 10 participants, to elicit household wellbeing indicators and to gain an in-depth understanding of social, cultural, relational, economic, and other important wellbeing issues (Table A6). Categorising the focus group discussions under men, women, and mixed gender was done to allow free expression of opinions from participants (Maldonado, Torres, and de Sáez 2013; and *1, a woman fish processor from the mixed gender FGD in Aboesi – Table A6*). With the help of the Fisheries Commission, the chief fisher, and the chief fish processor, a list was obtained with contact addresses from which a random sampling was done for the questionnaire

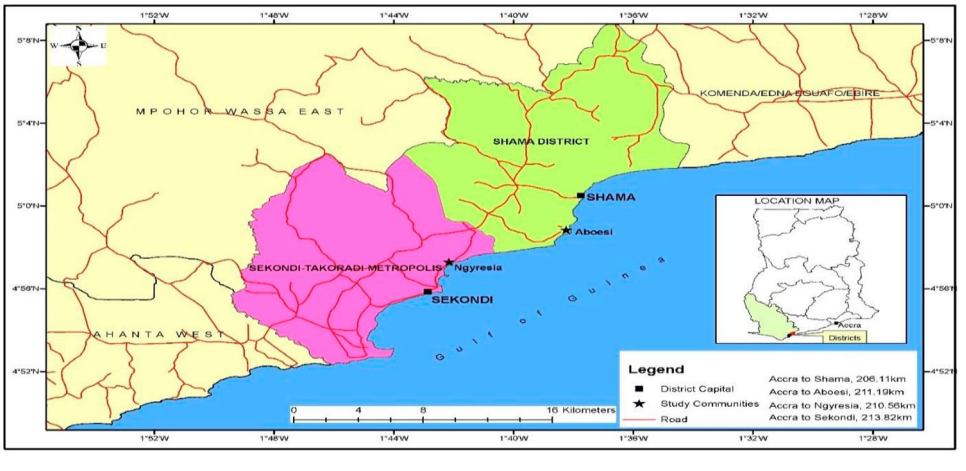

Figure 2. Western region, showing the location of Abuesi and Ngyiresia. Source: Geography Department, University of Ghana.

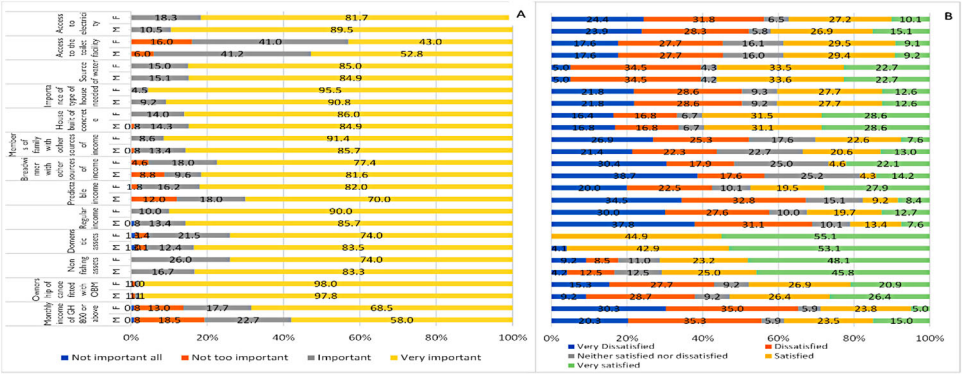

Figure 3. Rankings of material condition by male and female fishers. Source: Survey data; Importance → A, Satisfaction → B.

administration on 119 respondents. Eighty-seven of the respondents were men fishers, whilst 32 were women fish processors.

Results and discussion

This section presents and discusses the assessment of the importance and satisfaction of elements of the material conditions and the quality of life of households, and the satisfaction of elements with respect to sustainability, whilst noting gender differentials. The section further discusses the results from the PCA and the SEM.

Results of descriptive analysis

The descriptive analyses of the material condition, quality of life, and sustainability on fishers' well-being are presented in Figures 3–5. The data showed that almost all the factors under both material condition and quality of life were highly ranked in terms of importance; however, the level of satisfaction varies in ranking. Apart from a few economic variables, which were ranked slightly higher by the women fish processors than the men fishers, the results do not demonstrate much gender differences (Figures 3 and 4), as revealed also by the focus group discussions (*2, a woman fish processor from the mixed gender FGD in Ngyiresia – Table A6*).

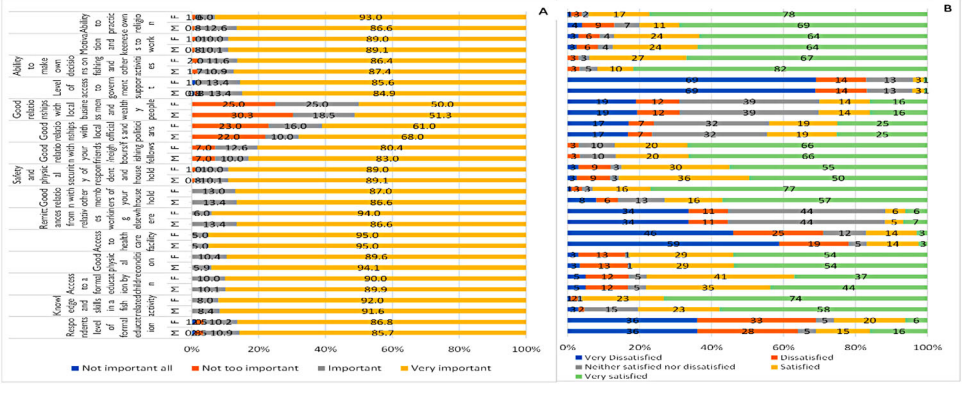

Figure 4. Rankings of quality-of-life by male and female fishers. Source: Survey data; Importance → A, Satisfaction → B.

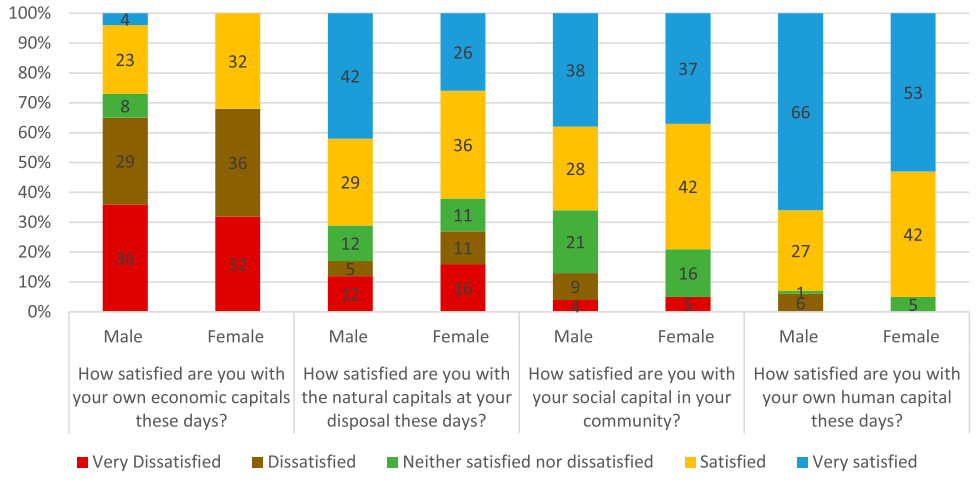

Figure 5. Sustainability ranking by male fishers and female fish processors. Source: Survey data.

According to Figure 3, the majority of the fishers (men and women) ranked monthly income (63.3 per cent), regular income (87.9 per cent), predictability of income (76.0 per cent), breadwinner with other source of income (80.0 per cent), and members of family with other sources of income (88.6 per cent) as very important. However, most of the fishers (average 55.7 per cent) were either very dissatisfied (average 29.0 per cent) or dissatisfied (average 26.7 per cent) with their level of income. These findings are consistent with Asiedu, Failler, and Beygens (2018), who reported that the fishers in Ghana have a low level of income. Anticamara and Go (2016) also found a similar result of declining income in the Philippine fisheries.

The data further reveals that households aspire to have good houses (93.2 per cent), but only 12.6 per cent were very satisfied with their attainment of this aspiration. The two communities ranked source of water (85.0 per cent) as very important, with a quite high level of satisfaction (56.3 per cent), probably due to the supply of water in tankers, even when pipe-borne water does not flow. Access to toilet facilities was ranked as very important (48.0 per cent); however, only 9.2 per cent were very satisfied with the facilities. This is consistent with Lokko and Anson (2002), who concluded that sanitation is poor in fishing communities in Ghana. Kalumbi et al. (2020) also recorded poor sanitation and hygiene in fishing communities along Lake Malombe in southern Malawi. Access to electricity was ranked as very important (85.6 per cent) because the fishers reported that they always need light to work deep into the night and produce ice blocks for fish preservation, but only 12.6 per cent were very satisfied (*3, a woman fish processor from the women FGD in Ngyiresia – Table A6*).

Under quality of life (Figure 4), a majority of the fishers (86.3 per cent) ranked their level of education as very important, but only 26.5 per cent were either very satisfied or satisfied. Despite their low level of formal education, the fishers consider their skills in fisheries as very important (91.8. per cent), and they were very satisfied (66.0 per cent) or satisfied (23.0 per cent) with their skills. It is these skills and the keenness of the fishers to work that keep them in fisheries. On the positive side, fishers consider their children's access to formal education as very important (90.0 per cent). Fortunately, 40.5 per cent were very satisfied, whilst 38.0 per cent were satisfied with their children's access to education. They were of the view that access to formal education would offer alternative livelihoods for their children, which may eventually reduce the dependence on fishing for sustenance in the future. Vieira, Moraes, and Nunes (2013), on the other hand, observed a low rate of education among young fishers on the northern coast of Brazil and suggested the need to synchronise school and fisheries calendars to curb truancy and age-class distortion in fishing communities. Consistent with Nunoo and Asiedu (2013), access to health care for building human capital is acknowledged by the fishers as very important (95.0 per cent), but only 3.0 per cent were very satisfied with

health facilities. Deme et al. (2021) also noted that, due to high cost of health care, small pelagic fishers in Gambia have less access to medical attention.

The fishers ranked good relations with other members of the household as very important (86.8 per cent) and were very satisfied (67.0 per cent). However, they were generally very dissatisfied (34.0 per cent) or dissatisfied (11.0 per cent) with remittances from relations residing elsewhere, even though such remittances were very important (90.3 per cent) for their wellbeing. Fishers valued relationships with other household members highly (86.6 per cent) and were very satisfied (67.0 per cent). The assertion of the benefits of fishing community interactions on welfare has also been outlined by Colón-Bacó (2010).

Beyond the community level, the fishers (85.3 per cent) have a strong belief in government intervention to facilitate their activities toward improving wellbeing. However, 69.0 per cent of them were dissatisfied (only 1.0 per cent very satisfied) with government support in terms of health, education, electricity, and sanitation infrastructure. So far, the government is highly involved in the provision of subsidised fuel, outboard motors, fishing nets, and laws for ethical fishing to protect the fishery resources. These laws and policies, which include closed-season fishing, use of prescribed fishing gears, and avoidance of light fishing, have low levels of compliance (Danquah, Roberts, and Appiah 2021).

Based on the ensuing discussions and buttressed by findings from the focus group discussions (*4, a man fisher from the mixed gender FGD in Aboesi – Table A6*), fishers are seen to have a strong bond with the fisheries resources, therefore getting communities out of fishing through policy regulation is not a route to reduce pressure on fish stock, at least not in one generation. This revelation was also noted by Asiedu, Failler, and Beygens (2018), who have reported that fishers attach prestige to their fishing activities rather than the income received from the industry. What is needed is to support fishers to diversify through education and skills-enhancement facilities and making the fishing communities habitable with basic amenities to attract investments that offer alternative employment opportunities.

Ranking of indicators under sustainability, which is disaggregated into the level of satisfaction of men fishers and women fish processors, is presented in Figure 5.

Sustainability, in terms of human, social, natural, and economic capital on wellbeing, had varied outcome with respect to men fishers and women fish processors. Human and natural capital were perceived to have a higher effect on wellbeing of men fishers than women fish processors, whilst social and economic capital were identified to have a better influence on wellbeing of women fish processors than men fishers (Figure 5).

The study revealed that men fishers were relatively fulfilled with their own human capital (66 per cent were very satisfied), compared to women fish processors (53 per cent). Women are usually concerned with multiple tasks, including livelihood, household activities, reproductive responsibilities, and, coupled with the use of heavy equipment in fisheries, activities may impede their progress in capacity development for better wellbeing. This argument is confirmed by Szaboova, Gustavsson, and Turner (2022), who found that women usually assist in maintaining the strong physical wellbeing of fishing households at the expense of their own material and emotional wellbeing. Though fishers generally agreed to the decline in fishery stock, 42 per cent of the men fishers and 26 per cent of women fish processors were very satisfied with the availability of the sea as a source of fish (natural capital). The reason for relatively higher satisfaction by men fishers compared to fish processors could be explained by the confession of men fishers during the focused group discussions (*5, a man fisher from the men FGD in Ngyiresia – Table A6*).

The study also noted that 66 per cent of men fishers and 79 per cent of women fish processors were either very satisfied or satisfied with their social capital[1] status. This finding indicates that social capital has a better influence on wellbeing of the women fish processors than men fishers. The result is consistent with the way Ghanaians, especially women (Adaawen and Owusu 2013), value relations with family (nuclear and extended) as a social capital for material, financial, or moral gains. Contrary to this revelation by the current study, Szaboova, Gustavsson, and Turner (2022), in their

investigation on women's capacity in backing the social resilience of United Kingdom's fishing communities, found a lower status of social and emotional wellbeing for women. Generally, the assertion of the benefits of fishing community interactions on wellbeing has also been outlined by Sultana et al. (2021) in coastal Bangladesh and by Squires and Wiber (2018) in the Canadian province of Nova Scotia. Our current study further found that 36 per cent of men fishers, and 32 per cent of women fish processors, were very dissatisfied with their own economic capital (income). Danquah, Roberts, and Appiah (2021) also revealed that the impact of declining fish landing on the income of women fisherfolks is lower than their men counterparts. The fisherfolks play different roles in the fish value chain. Whilst the men fishers mainly participate in elementary harvesting of fish, women fish processors are involved in cleaning, processing, distribution, and selling of fish to consumers (Torell et al. 2019). According to Nunoo and Asiedu (2013), each stage of the value chain could improve the wellbeing of fish processors through extra income due to appreciation in quality and value. Additionally, Amevenku, Asravor, and Kuwornu (2019) revealed that, though the fisherfolks have resorted to livelihood diversification as the primary mitigation strategies against the declining fish landings, women fish processors could easily diversify into petty trading, food vending, and dressmaking as an adaptive strategy to sustain their income levels. However, in agreement with Finkbeiner (2015), our current paper proposes the need to link diversification to long-term community interventions, such as improvement in educational infrastructure, to provide formal employment opportunities for young fishers to reduce dependence on fisheries activities.

Structural equation modelling results

Results of the PCA for factors that loaded highly in influencing wellbeing were maintained for confirmatory factor analysis (CFA) to affirm construct validity, and eventually used for the SEM analysis. Other consistency and reliability tests, including the Kaiser-Meyer-Olkin (KMO) result of 0.80, indicated sampling or data adequacy. Prior to these tests, a discriminant validity was performed, which confirmed no significant relationship among constructs (Tables A1–A5 and Figure A1 & A2 in Appendix). These probability values and indices supported the SEM as a good representation of the data. Results of the tests of hypotheses to assess the unidirectional and bi-directional effects of the three major indicators on household wellbeing (Table 1) revealed that the individual structural effects of material conditions (MC), quality of life (QL), and sustainability dimension (SD), respectively, on wellbeing are positive and significant. These results reinforce the observation by the OECD (2011) that material living conditions and quality of life play major roles in the wellbeing of people, as well as conditions required to ensure their sustainability over time.

Gillam and Charles (2018) also postulated that there are intrinsic links among economic, social, and environmental factors on wellbeing. In this study, a positive and significant bi-directional effect of MC and QL, MC and SD, and QL and SD on wellbeing were identified. Ruggeri et al. (2020) and Coulthard et al. (2014) further revealed that sustainable development is a holistic approach to ameliorating quality of life.

Table 1. Hypotheses test results.

Exogenous/Endogenous Path	Effects	Std. Error
MC → WELLBEING [H_1 is Supported]	0.2925***	0.0261
QL → WELLBEING [H_2 is Supported	0.6807***	0.0082
SD → WELLBEING [H_3 is Supported]	0.5619***	0.0287
MC ↔ QL [H_4 is Supported]	0.4548***	0.0581
MC ↔ SD [H_5 is Supported]	0.1778***	0.0649
QL ↔ SD [H_6 is Supported]	0.4061***	0.0652
SUMMATIVE AVERAGE TOTAL EFFECT	0.4790***	0.0419

Source: Survey data; → indicates uni-directional effect; ↔ indicates bi-directional effect; MC => material condition; QL => quality of life, SD => sustainability dimension.

Table 2. The structural equation model results.

Constructs and indicators	Coefficients	Std. error
Socioeconomic characteristics: Control factors		
Age (yrs)	−0.0019**	0.0009
Gender	0.0264	0.0321
Education (yrs)	0.0568***	0.0119
Household size	0.0053**	0.0021
Material condition		
Income and asset (IA)	−0.0287	0.0200
Job and earnings (JE)	−0.1517***	0.0220
Housing and related infrastructure (HRI)	0.0963***	0.0263
Quality of life		
Meaning and spirituality (MS)	−0.0749***	0.0189
Informal education and skills (ES)	0.0898***	0.0215
Environmental conditions (EC)	0.0432***	0.0157
Personal and household vulnerability (PHV)	0.3751***	0.0237
Empowerment and motivations (EM)	0.3541***	0.0227
Sustainability		
Natural capital (NCAP)	0.0814***	0.0125
Social capital (SCAP)	0.1637***	0.0116
Constant	−0.1384	0.0655

Source: Survey data.

The study also estimated that the summative average total effect (direct and indirect) of material condition, quality of life, and sustainability on wellbeing in the study area is 0.48, as highlighted in Table 1. This finding indicates that, although the combined influence of the three domains on well-being is positive, the effect is revealed to be very low. This revelation could be due to conditions including declining fish stock, which might have reduced catches per trip, resulting in a decrease in income generation and, for that matter, reduction in living standards among fishers. Danquah, Roberts, and Appiah (2021) confirmed a declining Catch Per Unit Effort (CPUE) in marine fisheries in Ghana and subsequent reduction in the welfare of fishers. Anticamara and Go (2016) also found that fishers are experiencing observable poverty in many coastal communities in the Philippines. Kpanou et al. (2021) argued that some laws forbidding the use of certain fishing gear hamper fishers' individual perceived wellbeing in southern Benin, suggesting their attachment to these gears. A study in Indonesia by Warren and Steenbergen (2021) suggested that policy makers and development practitioners should be seriously concerned with equity and sustainability of fisheries as a critical component of wellbeing of fishing communities and global food security.

Findings of specific factors under the major constructs and some socioeconomic variables on wellbeing using the SEM are presented in Table 2, whilst the path analysis is depicted in Figure A3 in the Appendix. The results show that household size and years of education have positive and significant effects on wellbeing, whilst age of fishers has a negative influence on wellbeing. Households with a greater number of people with higher education may provide the opportunity for diversified income earnings to enhance wellbeing. The results also reveal that older fishers may lack energy and capacity for fishing and may be conservative in adopting innovative technology to increase productive catches. Under the material conditions, income and asset, and job and earnings are identified to have negative influences on wellbeing; however, the relationship is weak with income and assets. Although many research findings have revealed that wellbeing is almost exclusively dependent on income (Allin and Hand 2017), some studies have demonstrated that the combination of income and other factors may improve or sustain the wellbeing of poor households (Gillam and Charles 2018). Housing and related infrastructures demonstrate positive and strong statistical effects on wellbeing. Being in agreement with Mahmud and Sawada (2014), this finding means that investing earned income into housing and other infrastructure is the pride and joy of the fishers.

The study also observed that meaning and spirituality have a negative and significant effect on wellbeing (Table 2). Most of the respondents in the study area are either Muslims or Christians who meet every Friday and Sunday, respectively, to worship their God and to support one another for

a better tomorrow. However, spirituality should be properly tied to other factors, such as cultural values, life skills, and education to improve the quality of one's life, as noted by Javed et al. (2016). Improved skills through informal education are estimated to be positive and significant. In agreement with Pita et al. (2022) and from the focus group discussions, fishers consider their level of skills acquired either by personal practise or through interactions with friends and social gatherings as very significant, enabling them to approach situations with confidence and optimism, which is important for their wellbeing (*6, a man fisher from the men FGD in Aboesi – Table A6*).

Environmental conditions, personal and household vulnerability, and empowerment and motivations are estimated to have significant and positive effects on wellbeing. This means that, although sanitation could be a challenge in some fishery communities (Freduah, Fidelman, and Smith 2017), choked gutters in the study area are often cleared through communal labour, whilst fish processing activities are sited at places that may not have adverse consequences on the environment. Responses from the focus group discussions (*7, a woman fish processor from the women FGD in Aboesi; and 8, a man fisher from the mixed gender FGD in Aboesi – Table A6*) and consistent with Rusdiana et al. (2020) revealed that fishers have a good relationship with members of the household and felt generally safe and empowered to take collective decisions concerning their fisheries activities. Moreover, a more proactive intervention by the government in terms of the provision of subsidised inputs, such as outboard motors, fishing nets, and premix fuel, motivates and empowers the fishers to stick to their business, even during declining catch (Deme et al. 2021).

In terms of sustainability of wellbeing, the study found that natural capital shows a positive effect on wellbeing (Table 2). This result means that natural capital (fishery stock) is considered as a key determinant of fishers' wellbeing. This provides a convincing argument for the conservation of fishery stock. Table 2 further demonstrates that social capital has a positive and a significant effect on the wellbeing of fishers, indicating that social benefits received through community relationship and social connections in times of crisis enhance wellbeing. The focus group discussion responses revealed that fishers in the study area have strong ties and trust for the chief fishers, who are believed to interact with the gods on their behalf and with policy makers (*9, a man fisher from the men FGD in Ngyiresia – Table A6*).

Helliwell (2005) suggested that measures of social capital in terms of general trust have substantial effects on wellbeing. The findings in this paper in relation to the effect of social and natural capital on wellbeing are very important for both national and global policy concerns. Consistent with responses from the focus group discussions, advocacy for fishery reforms to curb the overall fishing effort for restoration and sustainability of the world fisheries should be interlinked with fisheries management practices (e.g. avoidance of light fishing, use of recommended mesh net, and fishing ban policy), as noted also by Sultana et al. (2021), whilst emphasising infrastructural development (recreational centres) to enhance community interactions and social connections (*10, a woman fish processor from the mixed gender FGD in Aboesi; and 11, a man fisher from the mixed gender FGD in Ngyiresia – Table A6*).

Conclusion

The world fisheries have been declared to be in a state of "global crisis" because of the fall in global captured fisheries. Small-scale fishers in Ghana are currently facing one of the worst declines in fish landings in response to this crisis. The Ghanaian government has introduced policies to mitigate this situation. However, the success of these policies will depend on the wellbeing of fishers in terms their coping, adaptation, and transformative strategies for sustainable livelihoods, even as stocks decline. This paper assessed the wellbeing of fishers in terms of their material condition, quality of life, and sustainability in two rural communities in the western region of Ghana. Focus group discussions with men, women, and mixed gender groups were carried out to help design a structured questionnaire, which was randomly administered to the respondents. A descriptive analysis was adopted to assess the relationship between level of importance and satisfaction of wellbeing

factors of the fishers. It further employed the principal component analysis and the structural equation model to examine the individual and combined effect of material condition, quality of life, and sustainability on fishers' wellbeing.

The study revealed that, although most factors under material condition and quality of life were highly ranked as important, the level of satisfaction varied in ranking, with few gender differences. However, analysis of sustainability in terms of gender revealed that human and natural capital are perceived to have a higher effect on the wellbeing of men fishers than women fish processors, whilst social and economic capital are identified as having a better influence on the wellbeing of women fish processors than men fishers. Fishers ranked their level of education as low but are quite happy about the knowledge of their activities. They also have strong commitments to social and community relationships despite a low economic status. The study also found that fishers have a strong bond to fisheries resources and attach prestige to fishing activities more than the income received from the industry. They consider access to formal education (and skills training) for their children as very important to offer alternative livelihoods for their children, which may eventually reduce the dependence on fishing for sustenance.

The study revealed positive and significant bi-directional effects among the three major domains on wellbeing; however, the summative effect is identified to be low. Socio-economic characteristics (age, education, and household size) and factors under material condition (job and earnings, housing and related infrastructure), quality of life (empowerment and motivations, environmental conditions, personal and household vulnerability, meaning and spirituality, and informal education and skills), and sustainability dimension (natural capital and social capital) are significant in influencing wellbeing of fishers.

Based on these findings, the paper fills a gap in the literature by establishing the need for improvements in the educational infrastructure and training facilities for the children of fishers, which would provide livelihood options apart from fishing. The provision of alternative employment to the young fishers can reduce the over-dependency on fishery stocks in the future and enhance their wellbeing. The paper further proposes that reforms for sustainable fisheries and improvements in the wellbeing of fishers should be well coordinated in terms of management practices (e.g. avoidance of light fishing, use of recommended mesh net, and fishing ban policy), government supports (consistent supply of fishery inputs), and provision of basic necessities and infrastructural development (recreational centres, power supply, sanitation) to enhance community interactions and attract investments that offer alternative employment opportunities.

Note

1. Drawing on Bhandari and Yasunobu (2009), this paper takes a narrow view of social capital by focusing on social ties and networks from family units to the wider community relations.

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