Original Research Article

Socio-economic and Livelihood Conditions of Dry Fishers and Wholesalers: A Case Study from Coastal Dry Fishing Communities of Bangladesh

ABSTRACT

The coastal areas of Bangladesh, particularly the southeast region, is notorious for producing a majority of dried fish products in the country by recruiting numerous dry fishers and wholesalers (locally called as *Mohajon*). The study was conducted to observe the socio-economic condition and livelihood status of small scale dry fish producing communities in Nazirartek, a renowned fish drying village situated in Cox's Bazar, Bangladesh. The results were categorized into socio-economic and occupational profiles of the dry fishers and wholesalers separately. It was perceived that the dry fishers lived in a very underdeveloped state with low income and literacy rates, poor living standards and malnourished condition, whereas the livelihood of wholesalers was comparatively better. The inadequate compensations during the rainy seasons was another reason for the unimproved livelihood of the fishers. Because of this, they had to take up substitute agricultural or other occupations during the off-seasons of fish drying activities. Even though middle aged male workers were commonly assigned for labor-intensive tasks, most of the fish drying activities were carried out by females. About 63.33% of dry fishers had single family and 80% of wholesalers had joint family. Majority (60%) of the wholesalers attended secondary school, considering 56.66% fishers went up to primary school with no further secondary school education. Furthermore, over 50% fishers had an annual income of 81,000 to 100,000 BDT while 70% wholesalers had earned above 100,000 BDT year^{-1}. Primarily the major constraints faced by the communities included vulnerability to extreme weather, reliance on loans due to low wages, inadequate off-season income opportunities, lack of good treatment facilities, no prior training and scarcity of electronics. There is a lot of potential in the fish drying industries if appropriate management plan, marketing systems and employment opportunities are implemented.

Keywords: Dry fishers; wholesalers; socio-economic condition; livelihood status; Cox's Bazar.

1. INTRODUCTION

Fisheries management governs the different fishing activities of a community, such as who fishes, when and where fishing takes place, what is or isn't fished [1]. Surveying the socio-economic dimensions of a particular fisheries community postulates the outcome of the existing fisheries management and how the stakeholders of that community are coping with

it. Moreover, the purpose of doing socio-economic and livelihood evaluation leads to understanding if the management objectives of fisheries improvement projects are being met for the well-being of small scale fishers and gaining knowledge for the establishment of policy-making [2]. It will also give us an idea about what steps should be taken or specific adaptations to be made for the progress of social, biological and economic development of community-based fisheries. An impoverished livelihood and poor demographic of the fishing communities indicates that the implemented management strategies are in need of improvement. From the perspective of Bangladesh, limited research has been done on the socio-economic condition of the fishing communities in coastal areas of the country, and there are not enough studies on the livelihoods of individual dry fish producers to scrutinize their well-being, so that different organizations and the Government can implement certain policies and management approaches to improve the living condition of dry fish producers and other stakeholders. Dried fish processing and marketing instigate in the socio-economic and nutritional sector of the country, contributing to the increase of food production, diversifying the economy and creating employment opportunities [3].

The socio-economic condition, which is inseparable to the geographic-ecological condition of coastal areas, influences certain characteristics of the people [4]. It paints a picture of the living status of dry fish producers and wholesalers that is directly influenced by their level of education, health, fishing experience, number of earning family members, alternate income source and other factors. The most common obstacles encountered in coastal areas include high poverty level, degradation of natural resources, land use conflict and low village and health infrastructures in the region. Thus, coastal communities are vulnerable to these adverse conditions, leading to a sluggish socio-economic development.

Livelihood consists of different types of assets, capabilities and activities for the means of living and it can be called sustainable when people are able to adapt to adverse conditions and at the same time retain their assets or capabilities as they continue to lead a sustainable life [5]. More than 12% of total population of the country directly or indirectly are dependent upon the fisheries sector for their livelihood. The nature and characteristics of the coastal communities are strongly influenced by seasons, their livelihood, activities related to fisheries and agriculture, their fishing effort and other such factors [6]. In spite of the growing industry, the means of living of fish producers are quite poor, as their condition is influenced by not only the economy but also the climate and extreme weather conditions in the coastal region. Bangladesh is effected by about 40% of total storm surges in the world [5] and the livelihood of the coastal communities is highly vulnerable to environmental damage [6].

The Fisheries sector is an important aspect to be considered in terms of the development of the socio-economic condition of Bangladesh. The livelihood and socio-economic conditions should be taken into consideration for the development of future national policies and strategies. At present, there are still challenges to overcome in case of the development of coastal communities. Such constraints include- dry fish producers not getting enough compensation during the off-seasons and banning period, unable to create standard alternate employment opportunities or take loans, low wages of labors, low availability of infrastructures and training facilities, extreme poverty, inaccessibility of improved medications which leads to deteriorating health and any other contributing factors. The study was conducted to analyze the livelihood condition and socio-economic status of the dry fish producers and wholesalers at Nazirartek, Cox's Bazar and to assess the outcome of current fisheries management objectives.

2. MATERIAL AND METHODS

2.1 Study Area:

The study was conducted from January to May, 2021, at Nazirartek, largest fish drying area located in the western side of Cox's Bazar district of Bangladesh. The fish drying village is also known as 'Shutki Polli'. The area occupies about 200 acres of land on the estuary of Bakkhali river (Fig. 1).

There are approximately 1,500 dried fish producers and 20,000 laborers working at Nazirartek. Activities related to marine fisheries are seasonal [7] and the process of preparing dried fish starts from October and, with favorable weather condition, continues till February/March next year. Different fish species are used for drying including Largehead hairtail (*Trichiuruslepturus*), Bombay duck (*Harpodonnehereus*), Bigeye croaker (*Pennahiaanea*), Indian threadfin (*Leptomelanosoma indicum*), Indian pike conger (*Congresoxtalabonoides*), Dorab wolfherring (*Chirocentrus dorab*), Black tiger shrimp (*Penaeus monodon*) etc.

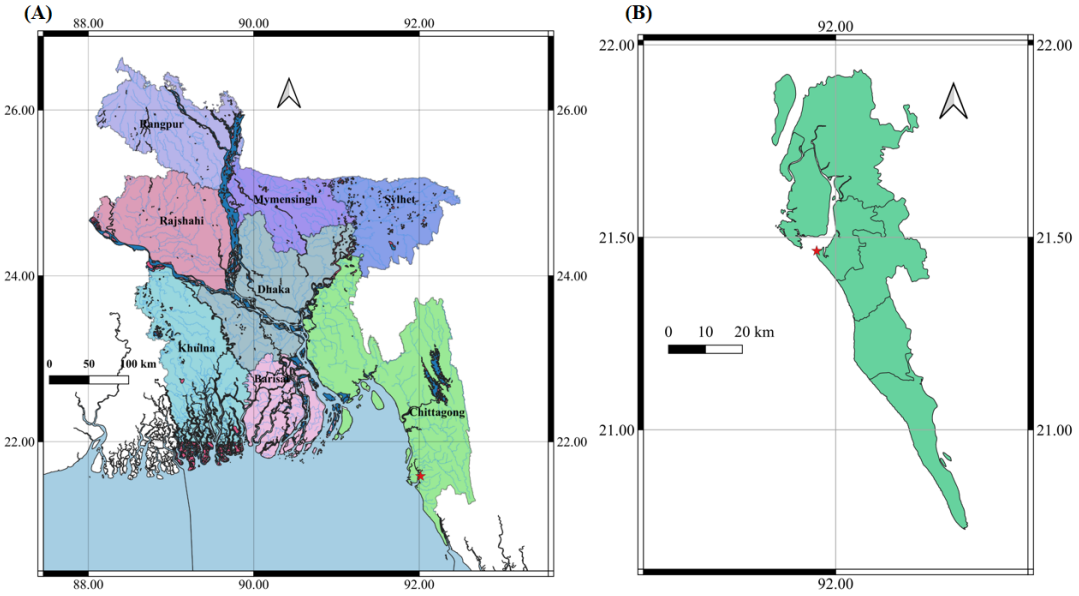

Fig. 1. Map showing the study areas, (A) the entire Bangladesh, (B) the district of Cox's Bazar with Nazirertek.

2.2Data Collection:

At first, the respondents were randomly selected for interviews. Primary data was collected through pre-prepared questionnaires and focus group discussions (FGD) with checklists from the respondents that included 30 dry fishers or labors and 10 wholesalers (Mohajon) working at Nazirartek. Two sessions of interviews and FGDs were conducted with 10-15 respondents in each session. Each session took about 1-2 hours.

2.3 Statistical Analysis:

Collected data were transferred to an excel sheet in terms of socio-economic and occupational profiles and analyzed for frequencies separately. The correlation among age, fishing experience and income was analyzed by Pearson correlation. The significant level was considered at p >0.01.

3. RESULTS

3.1 Comparatives Features of Socio-economic Dimensions between Dry Fishers and Wholesalers in the Nazirartek:

60% of dry fishers were of young age (<35 years), whereas 30% and 10% of fishers were middle and old aged, respectively (Table 1). In contrast, most of the wholesalers were between middle (60%) and old aged (40%). The contribution of female (86.66%) in drying activities were comparatively high than male (13.33%). Most of the contribution were observed as netting, fish beheading, gutting, salting, drying and other related pursuits. All person in dry fishers and wholesalers were Muslim. 63.33% of dry fishers had single family, whereas 80% of wholesaler had joint family. 46.66 % of dry fishers had small-size family (2-3 members), followed by 30% and 23.33% of fishers were medium (4-5 members) and large-size family (6-7 members). 80% of wholesaler had medium-sized family. 50% of fishers and 80% of wholesaler had one earning family members.

Table 1: Comparatives features of socio-economic dimensions between dry fishers and wholesalers in the Nazirertek, Cox's Bazar, Bangladesh during 2021.

Variables	Categories	Dry fishers (%)	Wholesaler (%)
Age	Young (<35 years)	60	0
	Middle aged (36-55 years)	30	60
	Old (Above 55 years)	10	40
Gender	Male	13.33	100
	Female	86.66	0
Religion	Muslim	100	100
	Hindu	0	0
Family size	2-3 members	46.66	10
	4-5 members	30	80
	6-7 members	23.33	100
	Above 7 members	0	0
Family type	Single	63.33	20
	Joint	36.66	80
Earning family member	1 person	50	70
	2-3 people	46.66	30
	Above 3 people	0	0
Educational status	Can sign only	43.33	0
	Primary (Class I to V)	56.66	10
	Secondary (Class VI to X)	0	60
	Higher secondary	0	30
	Graduation	0	0
	Masters	0	0
School going children	Yes	50	60
	No	46.6	40

Status in society	Ordinary	100	100
	Local leaders	0	0
	Respective people	0	0
Housing pattern	Tin shade	63.33	10
	Half cemented building (semi-permanent)	36.66	100
	Full cemented building (permanent)	0	0
Source of water	Own tube-well	46.66	80
	Neighbor's tube-well	53.33	20
Sanitation	Unimproved toilet	43.33	0
	Basic standard toilet	40	40
	Improved toilet	16.66	60
Diseases	Infectious	6.66	0
	Non-infectious	90	100
Treatments	Herbal	0	0
	Homeopathy	0	0
	Allopathy	100	100
Fuel for cooking	Animal dung and agri. Crop	50	0
	Wood	50	100
	Natural gas	0	0
Electricity	Yes	46.66	100
	No	53.33	100
Mobile	Yes	100	100
	No	0	0
Television	Yes	0	30
	No	100	40
Radio	Yes	0	0
	No	100	100
Refrigerator	Yes	0	60
	No	100	40
Communication to market	Concrete road	0	0
	Brick road	0	0
	Earthen road	100	100
	Water-way	0	0

Source: Authors survey, 2021

The educational status of the wholesaler was found superior compared to the labors' community. 60% of wholesaler attended secondary school, whereas 56.66% of fishers went to primary school with no further secondary school education (Table 1). 60% of wholesaler had school going children, whereas 50% of the fishers had school going children. 100% of both fishers and wholesaler had ordinary status in the community. The fish drying community

were not involved in any political work or had any local leaders. About 63.33% of dry fishers lived in tin shade housing, whereas all of wholesaler lived in half-cemented housing.

46.66% of dry fishers used their own tube-well while 53.33% used their neighbor's tube-well whereas 80% of the wholesaler respondents used their own tube-well. The sanitary condition was not any better in the communities as 43.33% and 40% labors used unimproved and semi-improved toilet respectively. Although 60% of wholesaler used semi-improved toilet followed by 40% unimproved toilet. The majority of fishers (90%) and wholesaler (100%) were infected non-infectious disease.

3.2 Comparatives Features of Occupational Factors between Dry Fishers and Wholesalers in the Nazirartek:

63.33% of dry fishers had 1-5 years of drying experience, followed by 23.33% with 6-10 years, 3.33% with 11-15 years, 6.66% with 16-20 years and 3.33% with more than 20 years' experience (Table 2). On the other hand, 30% of wholesaler had 11-15 years of experience, 20% had 16-20 years and 50% had more than 20 years of experience (Table 2). 56.66% of fishers earned 81,000-100,000 BDT year^{-1}, 20% earned above 100,000 BDT year^{-1}, 13.33% earned 40,000-60,000 BDT year^{-1} and 10% earned 61,000-80,000 BDT year^{-1}. In contrast, 70% of wholesaler earned above 100,000 BDT year^{-1} and 20% earned 81,000-100,000 BDT year^{-1}. The expenditure rate for the wholesaler was revealed to be half and half with 50% on fisheries and 50% on household activities (Table 2). Only 6.66% of fishers could save money and about 60% of wholesalers were able to save money.

Table 2: Comparatives features of occupational factors between dry fishers and wholesalers in the Nazirertek, Cox's Bazar, Bangladesh during 2021.

Variables	Categories	Dry fishers (%)	Wholesalers (%)
Fishing experience	1-5 years	63.33	0
	6-10 years	30	0
	11-15 years	3.33	30
	16-20 years	30	20
	Above 20 years	3.33	50
Selling	Direct market	0	100
	Middleman	0	0
	Retailer	0	0
Other occupations	Agriculture	16.66	0
	Business	0	0
	Animal rearing	16.66	0
	Others	10	0
	None	56.66	100
Source of training	Govt. organizations	23.33	100
	NGOs	0	0
	No training	76.66	0
Income/year	40,000-60,000	13.33	0
	61,000-80,000	10	0
	81,000-100,000	56.66	20

	Above 100,000	20	70
Expenditure	Fisheries	80	100
	Household	23.33	0
Savings	Can not	30	60
	Save	6.66	40
Source of loan	Relatives	0	0
	Bank	30	50
	NGOs	70	50
Purpose of taking loan	Fisheries	20	40
	Other occupation	30	0
	Housing	36.66	40
	Marriage	6.66	10
	Health	10	6
	Education	6.66	0

Source: Authors survey, 2021

Beside the main professions, the dry fishers involved with agriculture (16.66%), animal rearing (16.66%) and others (10%). Wholesaler did not have any secondary occupation. The majority (76.66%) of dry fishers did not have any prior training and 23.33% had received training from government organizations. All wholesaler also had received government training. No one had any training from any NGOs (Table 2). 70% of fishers took loan from NGOs followed by 30% from the bank. 50% of wholesaler took loan from NGOs and 50% from the bank. 36.66% of fishers took loans for the purpose of restoring and fixing their houses due to tidal surges in the coastal areas, 30% took loans for other occupations, 20% for fisheries activities, 10% for health, 6.66% for education and 6.66% for marriage. 40% of wholesaler took loan for the purpose of fulfilling fisheries related activities, 40% for housing purposes, 10% for marriage and 6% for health (Table 2).

3.3 Correlation among Age, Experience and Income in Dry Fishers and Wholesalers in the Nazirartek:

Pearson correlation among factors such as age, fishing experience and income in dry fishers and wholesalers were observed in Table 3. For dry fishers, age were positively significantly correlated with experience, whereas age were negatively related with experience for wholesalers. Income had positive insignificant relation with age and experience for fishers and wholesalers (Table 3).

Table 3: Pearson correlation among age, experience and income of dry fishers and wholesalers in the Nazirertek, Cox's Bazar, Bangladesh during 2021.

	Dry fishers			Dry fish wholesalers		
	Age	Experience	Income	Age	Experience	Income
Age	1	.962**	.132	1	-0.225	0.405
Experience	.962**	1	.056	-0.225	1	0.075

Income	.132	.056	1	0.405	0.075	1

**. Correlation is significant at the 0.01 level (2-tailed).

4. DISCUSSION

Small-scale fishers are one of the major vulnerable communities in Bangladesh [8]. Even though the occupation of fish drying has brought economical security to many people living in the rural coastal communities, there are many arising problems and constraints revolving around their subsistence. The socio-economic livelihood of the fishers and wholesalers is deeply influenced by their income, fishing experience, number of earning members, savings and loan. It was observed that due to their small income, the fishers faced many obstacles accessing the basic necessities in their daily lives and were unable to have an improved livelihood. In Nazirartek, the majority of dry fishers had comparatively lower income (<10,000 BDT month^{-1}). Similar results were observed in Kuakata, Barisal and Cox's Bazar [9, 10, 11]. Additionally, no major difference was found in terms of income of dry fish producing communities between Nazirertek and Chitapara [10]. Their housing pattern was very poor and they did not have access to safe drinking water. They were unable to have proper treatment for any illness or disease. Similarly, Kubra et al. [9] and Mitu et al. [10] found indigent health condition and unreliable housing in dry fish producers of Kuakata and Cox's Bazar. Similarly, Ahmed et al. [8] observed insufficient health facilities in small scale Hilsa fishers. In case of fishers in the Sundarbans mangrove forest, Mozumder et al. [12] observed that even though income has increased over the years the livelihood did not improve. In contrast, wholesalers had comparatively higher income than the fishers due to higher wages and societal stand. As a result, they can access better treatment facilities, nutritional food and can educate their children, thus are able to overcome the socio-economic crisis threshold. On the other hand, with an unstable income source, the fishermen and labors are unable to have savings, proper treatments or educate their children. Therefore, they end up having to take loans from wholesalers or NGOs. Due to the differences in income, the socio-economic status between fishermen and wholesalers is discrete. Corresponding to our results, Billah et al. [11] also concluded that levels of family income correlates with their economic condition.

The present study validates that fishing experience, income and age of fishers are all interconnected to each other, with significant correlation between age and fishing experience. It was observed that older fishers (>40 years) had comparatively smaller wages with less experience, while young fishers (<35 years) with more experience had more income and experience than middle aged labors. In contrast to the fishers, wholesalers had more experience and therefore their annual income was more, despite their age. Thus, fishers aged between 20 and 40 years were commonly associated with dry fishing activities. Kubra *et al.* (2020) also observed highest age category between 21 to 40 years in Kuakata and Barisal. Another study conducted by Mitu et al. [10] reported similar results with 30-40 years' age group in Nazirartek and Chitapara. Paul et al. [13] explained the reason for this is because age group between 31 and 40 is common in fishing activities and are considered more active.

While conducting the study, many limitations and problems could be identified in the fish drying communities in Nazirartek. The low wages of fishers led them to have poor food security and malnourished lifestyle. They could not have proper meals three times a day without access to food security and sanitation. On top of poverty, the fish drying communities face a great deal of bad weather condition in the coastal areas including storms, cyclones

and erosion. The activities of fish drying were highly dependent on environmental conditions. Due to their vulnerability to extreme weather conditions, the fish drying communities face several socio-economic obstacles for sustaining their livelihoods [10]. As drying activities are seasonal work, one of the limitations was that the fishers did not get enough reimbursements during the off seasons and so they had to take extra labor intensive workload. Mitu et al. [10] also reported similar observations in Cox's Bazar.

Present fish drying activities in Bangladesh revolves around traditional drying techniques with no modern facilities, training opportunities or appropriate funding for the communities involved in the dry fishing industry. In most cases, the dry fishers and wholesalers lack proper training and do not maintain hygiene protocols in producing good quality dry fish products. As a result, consumer demand and market profit for dry fish is declining. Hence, it is important to focus on the development of the socio-economic dimension and livelihood status of fishers and wholesalers of the fish drying communities in the coastal areas. The Government, NGOs and local authorities should provide training and facilities to the fishers and wholesalers in order to improve traditional fish drying techniques and at the same time maintain public health.

5. CONCLUSION

Bangladesh has great potential of becoming one of the widespread dried fish producing country in the world with its' various marine fisheries resources, competent weather, long seashore area, capable fishermen and dried fish producers. Several stakeholders such as- fishermen, labors, dried fish producers, wholesalers directly or indirectly play a role in the supply chain of dried fish producing community. The livelihood of fishers and wholesalers depend on a combination of socio-economic and educational factors. Although the living mode of wholesalers is better than the labors due to societal status, financial and technical stability, there are still so much to improve in the dried fish producers' community. The labors should be compensated sufficiently during rainy seasons, their employment opportunity in other agricultural fields should be guaranteed and the wages for female labors should be raised. The transport conveniences and financial support from banking sector are other factors that should be considered for further development of livelihood. The characteristics and significance of this sector should be considered as a priority because of its' extensive role in production, preservation and food safety. The government should take necessary steps to solve economic complications through various government support systems and pertinent policy interventions. Moreover, the environment of the coastal area also plays a significant role in poor economic and social conditions which have an impact on health. Support from expert health personnel and implementation of modern infrastructures through extension services can improve their living standards. The socio-economic, educational, health and nutritional status of the stakeholders in dried fish producing communities should be boosted sustainably with the help of extensive research, institutional, organizational and government support.

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