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Socioeconomic and livelihood status of floodplain fish farmers in Kotalipara upazila, Gopalganj, Bangladesh

MD ABDUL HALIM
Bangabandhu Academy for Poverty Alleviation and Rural Development (BAPARD) Kotalipara, Gopalganj-8110, Bangladesh; Corresponding author's Email. robi21114@gmail.com

Abstract. This paper describes the socio-economic and livelihood status of adjacent floodplain fish farmers in Kotalipara upazila, Gopalganj, Bangladesh. A survey was conducted from July to December, 2020 to assess the present socio-economic status of the fish farmers in a floodplain of Gopalganj district. The survey revealed that the average age and experience of fish farmers were 40.50±14.5 and 17.5±7.15 years, respectively. It was also found that 76.64% of farmers were married, 21.50% were unmarried and 1.87% were widows. It was found that 62.60% fish farmers had a kacha house, 6.20% had a paka house, 26.60% had semi-paka house and only 4.70% had two storied. Sixty percent fish farmers have kacha toilets, 20 % semi-paka and 10% have no sanitary facilities. About 27% of fish farmers practiced monoculture fish culture and 73% farmers followed polyculture culture. It was tracked down that 48% of the fish farmers gathered fries/fingerlings from the fry merchants, 5% from the Govt. farms, 25% from the neighborhood nursery, 10% from personal nursery and extra 12% from local hatcheries. In the survey region about 15% fish farmers manage aquatic weeds, 25% fish farmers dried out their water reservoir, 55% fish farmers refit the pond dykes and 5% fish farmers eradicate the bed sludge. At the end of the study, 25% fish farmers said that economic well-being has improved exceptionally, 55% fish farmers said that social situations have improved marginally and 20% fish farmers are static. In the final part of the study, 73% fish farmers reported that they used loose feed, 9% used pellets and 18% used both types. In the survey location, fish production was 2,964 kg/ha. All fish farmers were fully dependent on floodplain fishery for their livelihood. It is possible to uplift their socioeconomic status by managing the floodplain with improved technology.
Keywords: Socio-economics, Livelihood, Floodplain, Fish farmers.

Introduction

Bangladesh is a delta and the majority of its 147,570 km^2 region (BBS 2011) is mostly made out of alluvial stores borne by the Ganga-Padma, Meghna and Jamuna-Brahmaputra streams and their branches. Floodplains comprise over 55% of the land, and on yearly premise from 26,000 km^2 to 82,000 km^2 of them get immersed in the rainstorm and remain so for the following not many months. Floodplain water-bodies are one of the significant common pools of resources (CPRs) of Bangladesh (Thompson *et al.* 1998, Sultana and Thompson 2008). Bangladesh has 2.8 million ha of floodplain water-bodies (FRSS 2019). The current creation level in the floodplain region is just 283 kg/ha (DoF 2019), which can be expanded tenfold with least institutional help, yet earnest and co-ordinate endeavors are needed from the local area. Floodplain fisheries have been of specific importance for ages and around 11 million individuals were assessed to depend straightforwardly or in a roundabout way for their occupations on the Bangladesh fishery area in 1990 (World Bank 1991). Some 82% of the families that rely upon looking for money are poor (WorldFish Center 2003). Up to 80% of provincial individuals and about a portion of rustic poor families living in the floodplains get fish and utilize other oceanic assets, and up to 70% of creature protein utilization in Bangladesh is obtained from fish (Muir 2003, Toufique and Gregory 2008). A livelihood is made up of the capabilities, activities, and assets (including both material and social resources) that contribute to a means of living. Fisheries provide livelihood to about 12 million people of the country directly or indirectly and other ancillary fishery

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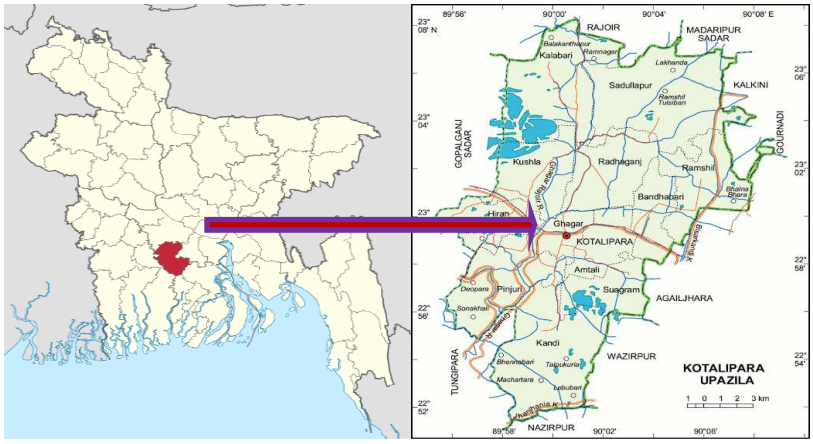
activities (DoF 2013). The Fishery area is very important towards the financial growth of Bangladesh and in the mitigation of rustic security (Mondal *et al.* 2016). Socio-economic profile plays an important role to characterize social life and behavior of an individual (Kusugal and Nagaraja 2013). Livelihood comprises the capabilities, the assets (natural, physical, human, financial and social), the activities and the accesses to these that together determine the living gained by the individual household (Chambers and Conway 1992). Fish farmer's people group is considered to be quite possibly the weakest networks as far as their job opens doors in Bangladesh (Farhana and Naser 2006). An examination researched a recent fad in Bangladesh since the 1990s: the private fenced in area of floodplains for aquaculture (Sultana 2012). In the first place, the pattern of changing occasional house over to private venture use is quick and far and wide: in three examination regions with various sorts of floodplain aquaculture (little individual activities, little gathering endeavors, and bigger fenced in areas worked by neighborhood organizations) more than 500 aquaculture nooks were reported, and the space of aquaculture expanded by 30% to100% yearly somewhere in the range of 1990 and 2008 (Sultana 2012). The main features of the socio-economic profile are age-composition, religion, caste composition, occupation composition, age at marriage, income, saving pattern and family background of respondents (Kusugal and Nagaraja 2013). The livelihood and socio-economic conditions that are decisive for the outcomes of culture floodplain base fisheries and should be taken into consideration in the development of future national policies and strategies have been assessed and discussed.

Materials and Methods

***Study area*:** This study performed through a coordinated methodology with the interest of changing Floodplain fish farmers in Kotalipara (located at 22.9833°N 89.9917°E), Gopalganj, Bangladesh from July to December, 2020.



Map 1. Study area.

Data collection technique

***Primary data*:** Primary data on the livelihood and socioeconomic status of the fish farmers were collected using a questionnaire survey. Primary data from 100 fish farmers were interviewed using a well-defined and pre-tested questionnaire. Data were also collected through personal interview supplemented by multiple methodological Participatory Research Approach (PRA) tools such as Focus Group Discussion (FGD) and Crosscheck Interviews (CI) with key informants at home or floodplain sites during fishing activities.

***Secondary sources*:** The auxiliary wellsprings of information were region library, Gopalganj; various sites and diaries; Upazila Fisheries Office, Kotalipara and District Fisheries Office, Gopalganj. Secondary information on important data for status of floodplain were gathered through writing and distributions accessible from Upazila Fisheries Office, quarterly and yearly information.

***Data processing and analysis*:** After an assortment of information from the field, meeting, FGD and individual perception; the information was confirmed to dispense with mistakes and irregularities. The subjective information was classified and dissected chiefly dependent on expressive factual examination utilizing MS Excel-10 and Rstudio.

Results and Discussion

***Age and marital status of the fish farmers*:** About 31.80% of the farmers were found to be in the age-group of 26-34 years, 25.20% of 35-44 years, 19.60% of 18-25 years, 20.60% of 45-54 years and 2.80% above 55 years (Fig. 1). According to Ali *et al.* (2009) most fish farmers (50%) were in the age group of 31-40 years in the region of Mymensingh, Bangladesh. Comparable outcomes were additionally seen nearby the old Brahmaputra River where half of the fish farmers were in the range of 31-40 years (Hossain *et al.* 2013). The survey revealed that 76.64% of farmers were married, 21.50% were unmarried and 1.87% were widowed (Fig. 2).

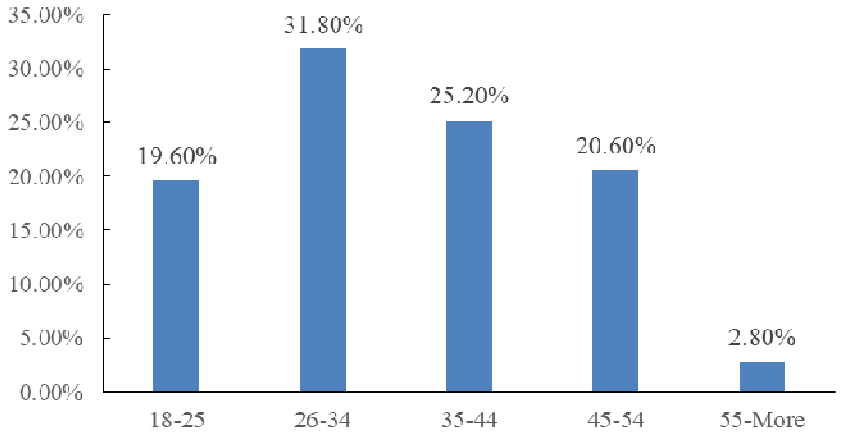


Fig. 1. Age of the fish farmers.

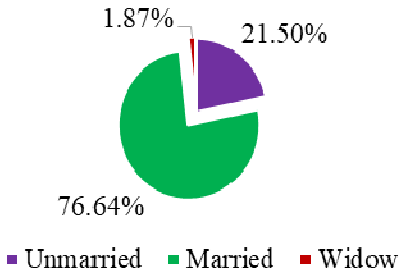


Fig. 2. Marital status.

***Family size and education status*:** Fish farmers in the study area were divided into six categories according to family sizes. Only 9.00% of the farmers had small family with 2 members, 10.40 % had 3 members, 20.80 % had 4 members, 32.10% had 5 members, 18.90 % had 6 members and 17.00 % had more than 6 members (Fig: 3). While the majority of the fish farmers (45%) had a place with 4 to 5 part's family in Mymensingh area (Ali *et al.* 2009). As survey reports the most noteworthy rates (47.76%) of families had 7-8 individuals, the least rate (1.27%) was obtained 1-2 individuals from Marjat baor at Kaligonj in Jhenidah area, Bangladesh (Bappa *et al.* 2014).

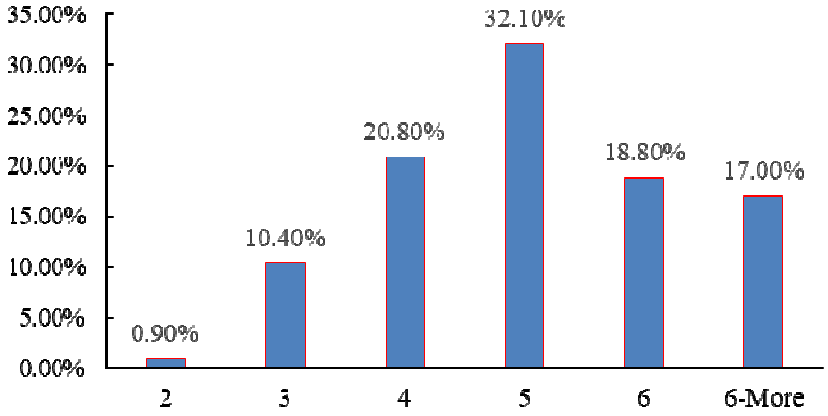


Fig. 3. Family size.

It was found that1.90%of participants were illiterate, 13.30% achieved literacy level education, 18.70% achieved primary level education, 14.00% achieved secondary level and 13.10% achieved SSC level, 14.00% were in the category of HSC level and 14.00 % were graduates and/or post graduate (Fig. 4). In the survey, 23.3% fish farmers were illiterate though 14.4%, 8.9% and 6.7% were taught up to primary, secondary and higher secondary or above level respectively (Zaman *et al.* 2006). In the discovered greater part of fish farmers (60%) were illiterate in the Marjat Baor at Kaligonj in Jhenidah region (Bappa *et al.* 2014, Kostori 2012 and Galib *et al.* 2013). In the study area, it was found that 52.78% fish retailers had no formal education while working at Rajoir upazila of Madaripur district in Bangladesh (Ali *et al.* 2011).

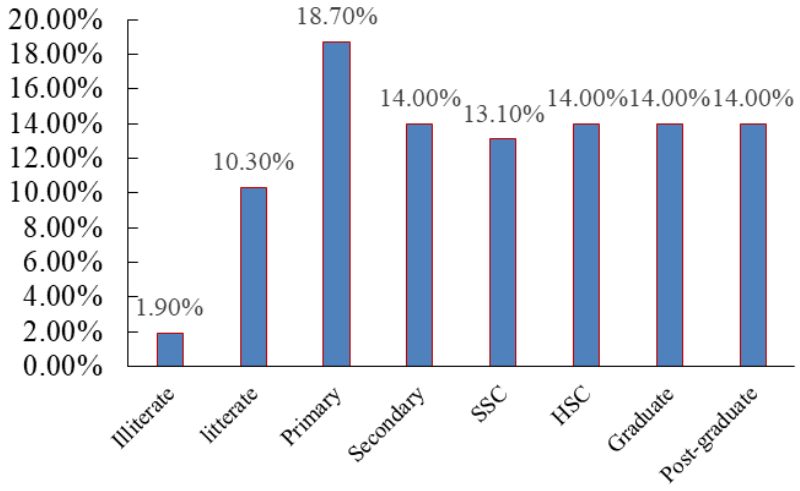


Fig. 4. Education status.

***Drinking water facilities*:** During the review it was discovered that 75.70% of fish farmers have entrée to tube-wells for intake water. About 1.87% of farmers have wells, 1.87% of farmers have collected their drinking water from ponds, rivers and municipal supply water. 17.76% of participants have their own supply/submersible for drinking purposes (Fig. 5). In Baluhar Baor, Jhenidah area, a family of 100% fish farmers utilized tube-well water for drinking and among them, 96% family utilized claimed tube-well, and 4% utilized neighbor tube-wells (Adhikary et al. 2013). It was shown that 82% fish farmers utilized profound tube-well water while staying 18% gathered water from different sources like water way, trench water and so on in Marjat Baor at Kaligonj in Jhenidah area, Bangladesh (Bappa *et al.* 2014). It was tracked down that 40% of fish farmers had their own tube-well, half utilized shared tube-well and 10% utilized neighbors' tube-well (Adhikary *et al.* 2013).

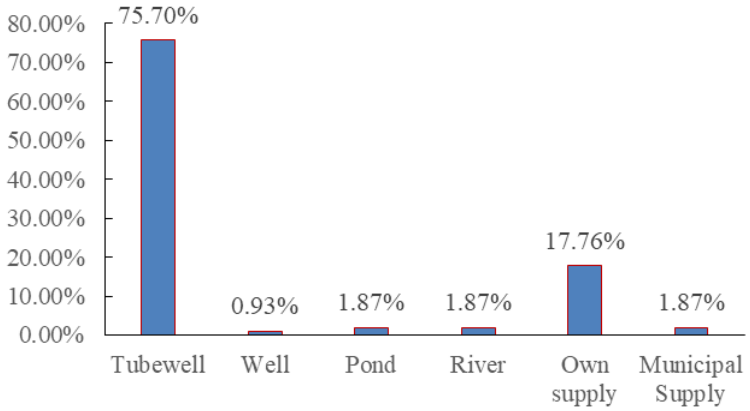


Fig. 5. Drinking water facilities.

***House and sanitation status*:** Home type is perhaps the most significant pointer of the financial status of the examination regions. From the review, it was tracked down that 62.60% had a kacha house, 6.20% had house paka, 26.60% had semi-paka house and just 4.70% had two put away (Fig 6). About 82.22% of family structures were kancha while 11.11% were semi-paka and just 6.66% were paka of the Basantapur beel anglers. 50% fish rancher in Mymensingh area had tin shed, 23% had katcha, 23% had semi-paka and only 4% had paka building (Ali *et al.* 2009) which was pretty much like the finding of present investigation. As indicated by (Adhikary *et al.* 2013) discovered house condition was overwhelmed by kacha (74%) where (Galib *et al.* 2013) established that larger part of anglers in Old Brahmaputra River (83%) had kacha and 17% had semi paka house offices. It was investigated that the extraordinarily large part (83%) had kacha and 17% had semi paka houses (Hossain *et al.* 2013).

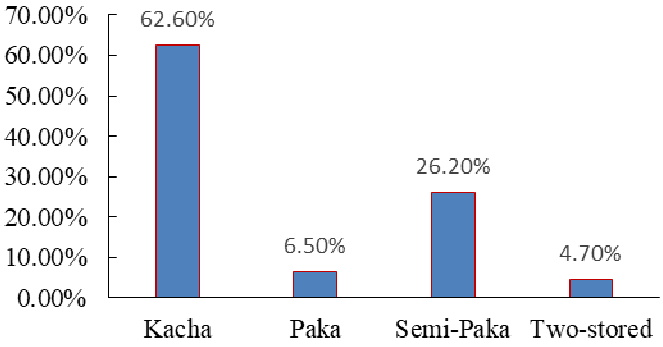


Fig. 6. House of the fish farmer.

In the study area the respondent has good sanitation status. Sixty percent fish farmers have Kacha toilets, 20% have Semi-paka and 10% have no sanitary facilities (Fig. 7). It was reported that 62.5% of fish farms had semi-paka clean offices in Mymensingh district (Ali *et al.* 2009). The sterile conditions were extremely poor for the fish farmers in the Rajshahi area (Zaman *et al.* 2006) and they experienced diarrhea and cholera because of absence of good sanitary facilities (Ali *et al.* 2008).

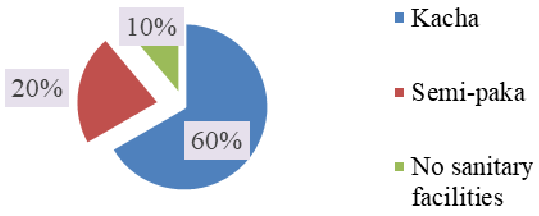


Fig. 7. Sanitation status.

***Land area*:** It was observed that 8.40% of farmers had no land for agriculture. About 40.20% of farmers have 1-5 decimal, 24.30% of farmers have 6-10 decimal. 18.70% of farmers have 11-20 decimal, 6.50% of farmers have 21-40 decimal, 0.90% of farmers have 41-60 decimal

and 0.90% of farmers have101-more decimal for cultivation (Fig. 8). It was reported that 2% fish farmers were landless and land possessed by the fish farmer was 0.02 to 1.57 ha in Monirampur upazila of Jashore (Galib *et al.* 2013) whereas fish farmers of was Hatiya upazila under Noakhali had 8.75 decimal land (Rahman *et al.* 2012). 82% fish farmers had under 31 decimal lands, in Rajoir upazila of Madaripur district, Bangladesh (Ali *et al.* 2011).

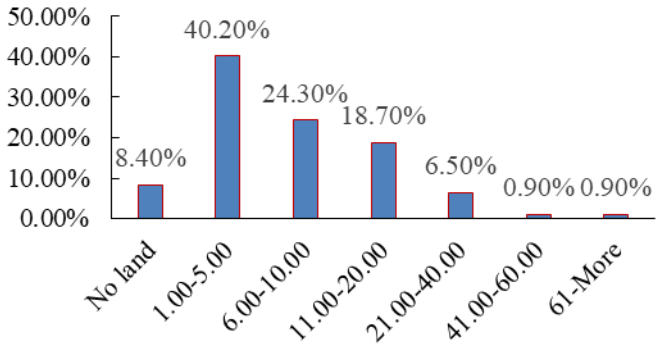


Fig. 8. Land area.

***Experience of fish culture*:** Mean experience in fish farming was found at 17.5±7.15 years. It was found that experience and training on fish culture affected the final fish production and their production was found 47% higher than those farmers having no experience (Mohsin and Haque 2009, Chaki 2011).

***Occupations*:** All the respondents had multiple occupations. Significant essential occupations (as far as pay) were fish farming (75%), crop farming (20%) and services (5%) (Fig. 9). This demonstrates that larger respondents did not surrender the calling of their progenitors. Secondary occupations were likewise recorded. The most widely recognized optional occupation was crop cultivating (20%) and assistance (5%). It was referenced that this inclination of inclusion into an alternate occupation is high during off-fishing season (Kostori 2012).

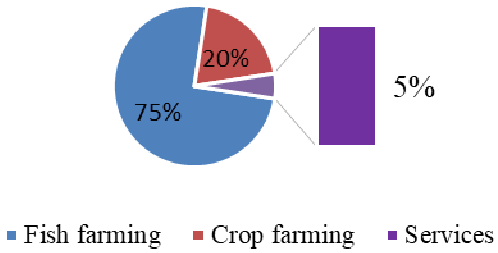


Fig. 9. Occupation.

***Training status*:** Sixty percent fish farmers had training on fish culture from BAPARD, 20% from DoF, 15% from NGOs and 5% had no training (Fig. 10). The current status of preparing uncovered the real condition of the fish farmer, and showed that they were a long way behind

from the chance to foster their skill from formal or informal gathering. Only 4% fish farmer had training on fishing and fish culture similar to (Galib *et al.* 2013).

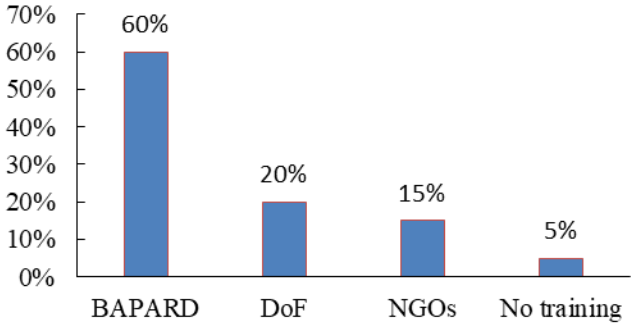


Fig. 10. Training on fish farmer.

***Fish culture practices Source of fish fingerlings*:** It was observed that various fish cultures were practiced in the study area. About 27% fish farmers said that they practiced monoculture and 73% farmers followed polyculture (Fig. 11). It was observed that 87% farmers were involved in pangus culture with other fish (polyculture), while 13% farmers were engaged in only pangus (monoculture) (Shikha *et al.* 2018). It was detailed that just 26% of the ponds were utilized for monoculture and 74% of the ponds were utilized for Pangasius with Indian major carps (Hossain 2001).In the survey areas, it was found that 48% of the farmers collected fries/fingerlings from the fry merchants, 5% from Government farms, 25% from the neighborhood nurseries, 10% from their own nursery and another 12% from nearby hatcheries (Fig. 12). It was found that 60% of the farmers collected fries/fingerlings from the fry brokers, 7% from the public authority farm, 13% from the nearby private homesteads or nurseries, 7% from own nursery and other 7% from both fry merchant and neighborhood hatcheries facilities (Shikha *et al.* 2018).

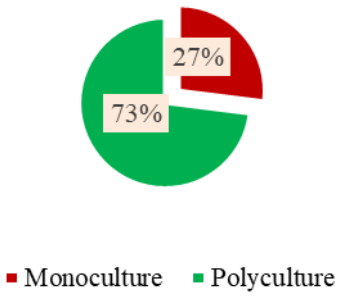


Fig. 11. Fish culture practices

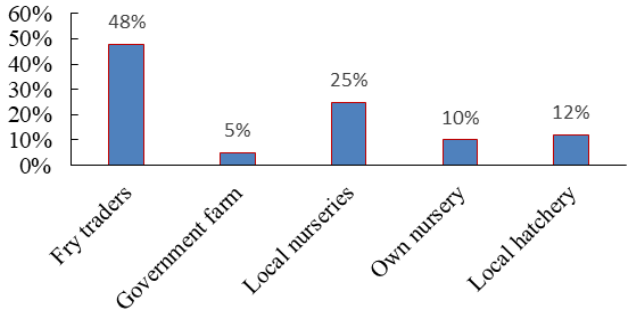


Fig. 12. Source of fish fingerlings

***Pre-stocking pond management*:** In the survey region about 15% fish farmers control aquatic weeds, 25% farmer dry their ponds, 55% farmers fix the pond dykes, 5% farmers eliminate the base mud and 3% ponds fencing comparative (Fig. 13) similar to (Shikha *et al.* 2018).

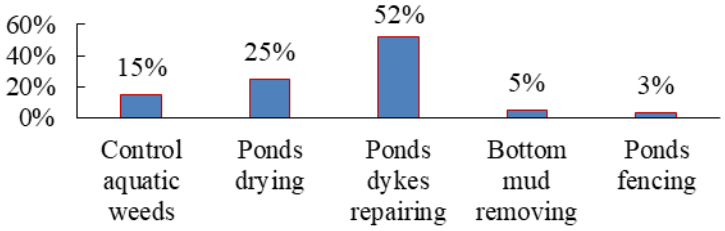


Fig. 13. Pre-stocking pond management.

***Socio-economic condition*:** In the end of the study, 25% fish farmers detailed that societal position have been improved profoundly, 55% fish farmers announced that social situations have improved somewhat and 20% fish farmers are unaltered comparative (Fig. 14) similar to Shikha *et al.* 2018. According to (Alam *et al.* 2009) 70% of the fish producers could work on their financial condition through fish cultivating.

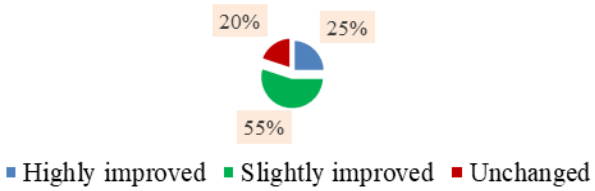


Fig. 14. Socio-economic condition of fish farmer.

***Feed for fish farming*:** The survey also revealed that 73% of fish farmers used loose feed, 9% used pellet and 18% used both types (Fig. 15). On the other hand, 70% farmers utilized loose feed, 23% utilized the both types and just 7% utilized pellets (Sheheli *et al.* 2013). Moreover, Parvin (2011) discovered 90% farmers utilized business pellet and 10% farmers utilized homestead made feed for raising fishes in Mymensingh area.

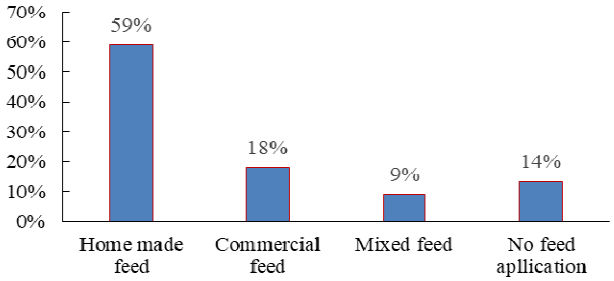


Fig. 15. Feed application.

Disease prevention: It was found that 13.60% fish farmers told that they prevent argulosis disease, 22.70% respondents recovered white spot syndrome disease, 4.50% respondents prevented gill disease, 9.10% respondents prevented dropsy disease, 9.10% respondents prevented fin/tail rot disease, 9.10% respondents prevented fungal infection and 27.30% respondents were asked no disease prevention knowledge (Fig. 16) similar to (Sheheli *et al.* 2013).

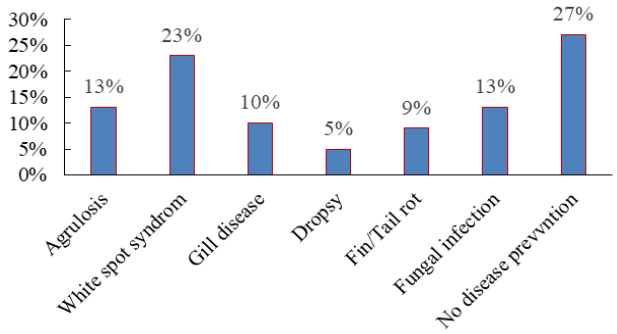


Fig. 16. Disease prevention in the study area.

Fish production: In the survey region, fish production was 12kg/dec or 2,964 kg/ha (Table I). Whereas, Biswas (2003) observed the fish production 743 kg/ha in Mymensingh district

Table I. Average fish production (Kg/dec) in the survey area

SL No.	Species		Average production (Kg/Dec)
	Local name	Scientific name	
01	Rohu	*Labeo rohita*	12.60
02	Catla	*Catla catla*	12.05
03	Mrigal	*Cirrhinus cirrhosus*	11.90
04	Carpio	*Cyprinus carpio*	9.35
05	Silver carp	*Hypophthalmicthys molitrix*	13.12
06	Bata	*Labeo bata*	6.85
07	Sharputi	*Puntius sarana*	6.08
08	Pangas	*Pangasius hypophthalmus*	12.90
09	Shing	*Heteropneustes fossilis*	4.86
10	Magur	*Clarius batrachus*	6.98
11	Koi	*Anabas testudineus*	5.75
12	Tengra	*Mystus vittatus*	3.12
13	Aair	*Mystus aor*	8.90
14	Taki	*Channa punctatus*	5.78
15	Shol	*Channa striatus*	6.90
16	Guchi baim	*Macrognathus pancalus*	2.70
17	Tara baim	*Macrognathus aculeatus*	2.50
18	Planet catfish	*Ompok pabda*	3.50
19	Gulsha tengra	*Mystus cavasius*	3.10
20	Freshwater shark	*Wallago attu*	6.00

Aside from some difficulties on financial aspects and imperatives of fish cultivating, farmers in this area contribute a striking piece of floodplain fish production in Bangladesh. Hopefully fish farmers will change their livelihood by managing the floodplain with improved technology. As the fishery area assumes an essential part in the financial turn of events, opportunity for work, neediness lightening and acquiring unfamiliar cash for Bangladesh, it might be reasoned that we need to lessen all the requirements of aquaculture to accomplish practical production in future.

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